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**ASX: FNT**

ASX Limited  
Company Announcements Office

31st July 2017

## TECHNICAL REPORT – QUARTER ENDED 30th JUNE 2017

Frontier Resources Ltd (ASX: FNT) (**Frontier** or the **Company**) is focussed on mineral exploration in highly prospective Papua New Guinea (PNG). The Company is targeting copper+/- gold +/-molybdenum porphyries and intrusive related epithermal gold deposits on its Exploration Licences (ELs), plus a number of significant EL Applications. Exploration and drilling is strongly warranted on all areas.

The Papuan Fold Belt contains Frontier's Bulago and Muller ELs and the Ok Tedi porphyry copper-gold Mine (located 80km WNW of Bulago), Porgera intrusive/ epithermal related gold Mine (120km east of Bulago) and Kili Teke porphyry copper-gold Deposit (50km east of Bulago). The Andewa and Ala River areas are located within the Melanesian Arc, that also contains the Lihir gold Mine, Panguna (Bougainville) porphyry copper-gold Mine and the Simberi gold Mine. Both terranes are highly prospective for giant gold and copper -gold deposits.

### SUMMARY

**Bulago** One diamond core hole (303.9m total of HQ TT) was completed in the Bulago Valley in early-May. Stream sampling located to the west, northwest Swit Kai was completed along with drainage float and outcrop sampling.

The Minister for Mining in Papua New Guinea renewed EL 1595 – Bulago, effective July 7th 2016 for the normal 2-year period.

**Project Acquisition** Option Agreements were signed during the quarter for the acquisition of the Andewa and Ala River ELs, plus Kol Mountains ELA from Frontier's Chairman (subject to shareholder approval).

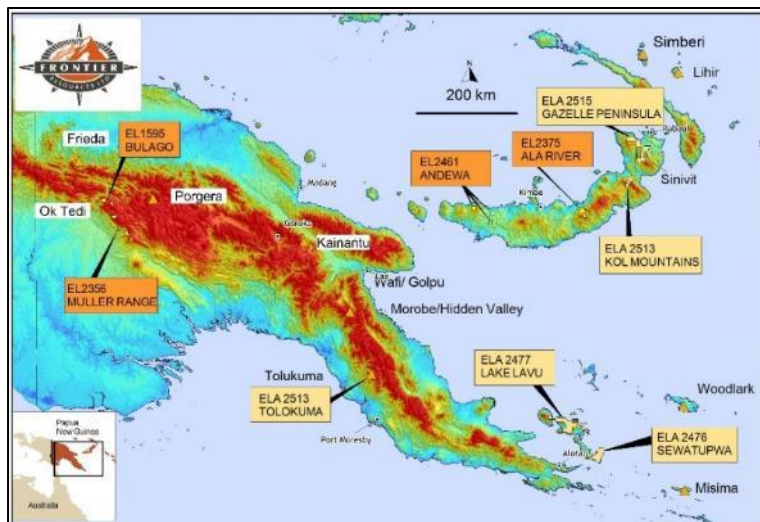
Terms were modified on EL 2461 19/7/17 to remove all consideration and Andewa will be acquired for free from interests of Chairman Peter McNeil, when it can be transferred.

**Muller** Thirteen samples were collected, six were analysed and weak gold and copper anomalism was demonstrated.

**Gazelle** ELA 2515 - Gazelle (including the former Sinivit gold Mine) was refused grant by the Minister for Mining in Papua New Guinea in late April. ELA 2529 was lodged for the Gazelle area again and it is 'next in line'.

**Tolukuma** ELA 2531 – Tolukuma was lodged that surrounds the Tolukuma Mining Lease.

**Corporate** The 2017 Rights Issue was closed.



## Strategy for the Second Half of 2017

- ✓ Commence Reconnaissance at Stoneleigh Copper- Gold Porphyry Prospect to Define Drill Targets
- ✓ Raise Capital to Fund Exploration and Drilling
- ✓ Undertake High Grade Gold Resource Drilling at Komsen Prospect, Andewa
- ✓ Open Up Tinga Copper- Gold (Muller) for Evaluation, then Joint Venture it to a Major or Drill Test
- ✓ Evaluate Future Exploration Requirements and Timing for Bulago Copper- Gold
- ✓ Obtain the Excellent Tolukuma Gold ELA

Chairman and Managing Director Peter McNeil M.Sc., stated:

*Frontier will now acquire 100% of the Andewa EL for nothing from my company WNB Resources Ltd, when transfer is allowed under the PNG Mining Act (no 'Trading' is allowed in ELs during their first 2-year Term). This is an excellent outcome for Frontier's shareholders.*

*The previous Option arrangements for Frontier to acquire Andewa required a 'Fair and Reasonable' Report (under ASX Listing Rule 10.1), to be presented to Frontier's shareholders to enable them to vote on potentially obtaining the Projects, as I am a 'related party'. The report must be written by an independent Financial Consultant, for a significant cost and there would be a long-time lag until post-AGM before we could undertake any work on the projects and hence a share price that continued to languish.*

*Frontier's Bulago and Muller ELs are located in the PNG fold belt (Hela and Southern Highlands Provinces) and access will remain difficult due to the wet season until October, precluding conducting cost-effective exploration. This means the Andewa EL in New Britain is compatible for 'alternate/ off season' exploration.*

*The Andewa EL has an excellent pedigree, being last explored by the Newcrest /Frontier JV until 2013, with a required earn in expenditure of \$19.25M, \$1.915M reimbursement, \$0.75M placement, a minimum spends = \$2.5M and a 19.9% deferred carried interest.*

*The 100% acquisition of this Exploration Licence will reinvigorate Frontier and allow us to commence exploration again forthwith. Mineral prospectivity and access for possible future mine developments in the EL area is very good, with several square kilometres of strongly anomalous gold and copper in grid based soils, with large and deep 3D IP and resistivity anomalies and drill intercepts between 106.6m of 0.75 g/t + 0.30% copper and 993.3m of 0.10 g/t gold.*

***High grade gold drill intercepts at Komsen Prospect include 1.5m of 39.3 g/t, 1.0m of 18.4 g/t, 5.9m of 13.1 g/t, 10.8m of 7.0 g/t and will be targeted by resource estimation drilling ASAP.*** The results above and previous terms for the Option to obtain a 90% equity in the Andewa EL were announced to the ASX 28th April 2017.

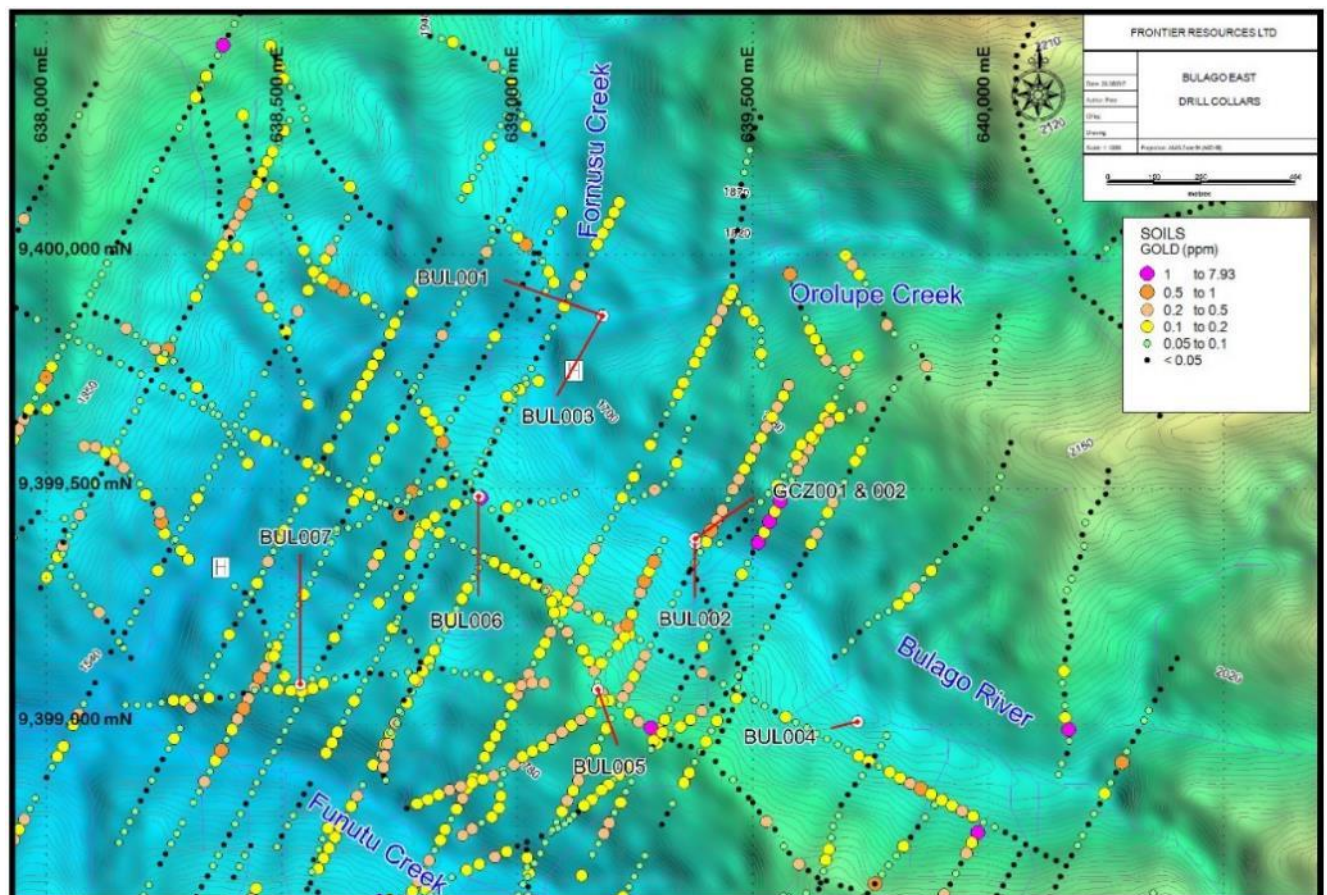
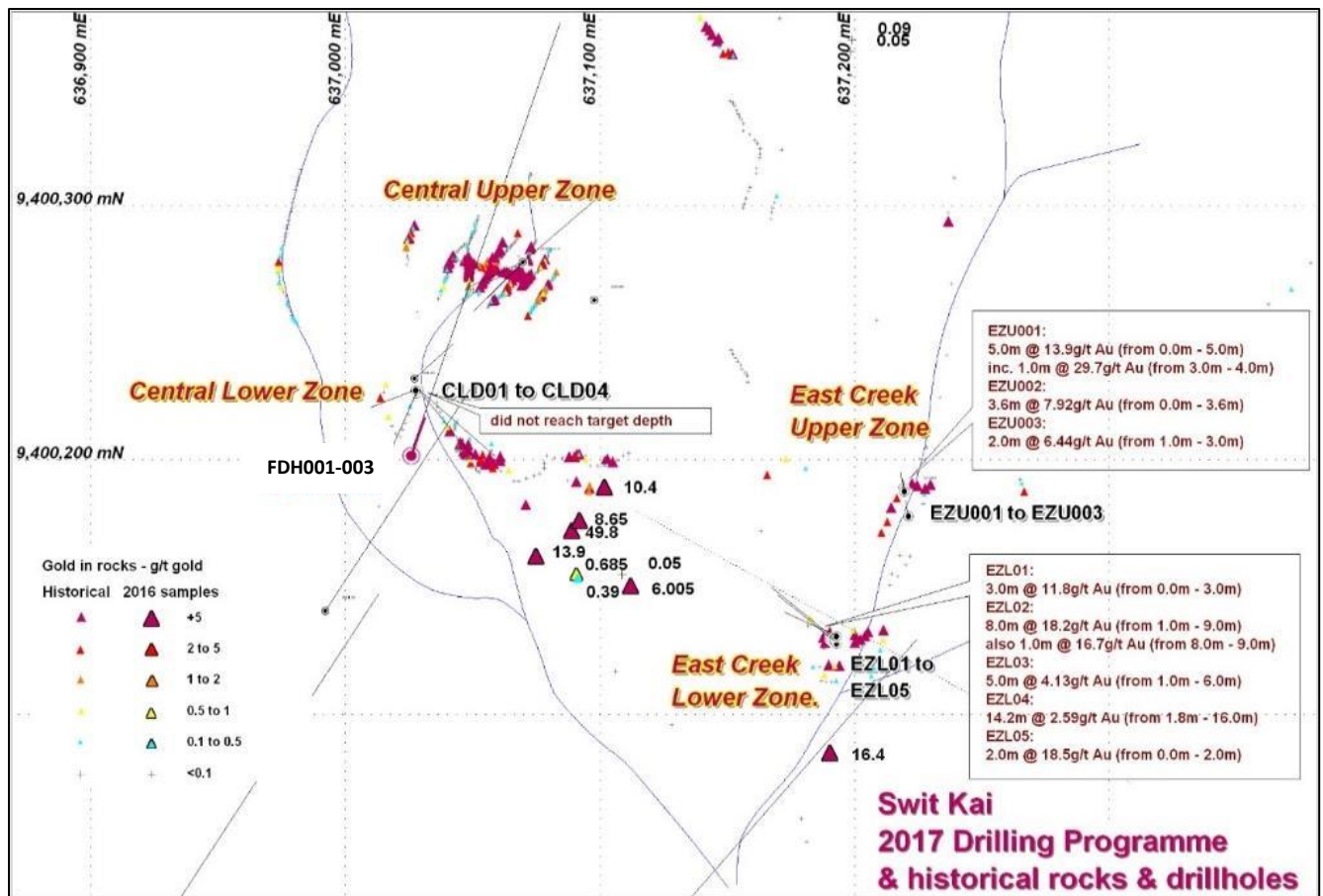
## DETAILS

### **EL 1595 - BULAGO - Diamond core drill holes FDH002, FDH003, and GCZ001 /GCZ002.**

The 2017 drilling program at Bulago had initial success with intercepts of 0.6m of 50.7 g/t, plus a proximal 1.1m of 79.18 g/t (Announced to ASX 10<sup>th</sup> April) with hole FDH001, demonstrating the Swit Kai structure is locally strongly gold mineralised. Swit Kai holes FDH002 and 003 were drilled at different inclinations from the same drill pad as FDH001 and both also intersected the gold mineralised structure, returning up to 8 g/t gold, but not bonanza gold grades.

Holes GCZ001 (abandoned) and 002 (redrill) targeted porphyry copper-gold in the NNE trending/ NW dipping anomalous gold in soil zone crossing the Bulago Valley, at its junction with the WNW trending Bulago River structure + gold in soil trend. The hole intersected 6 major zones and >10 smaller zones of hydrothermal brecciation/ veining in diorites and mudstones over its 303m length. Every sample was above the detection limit for gold, however, none of the zones contained potentially economic gold or copper mineralisation.

The best copper intercept in GCZ002 was 2.4m grading 0.16% copper (+ 0.16g/t gold at the top of hole), the best gold intercept was 3m grading 0.36 g/t and the entire hole averaged 0.06 g/t gold + 308 ppm copper + 9 ppm molybdenite. About half of the hole was 'moderately' molybdenite mineralised, with a peak of 35ppm. Geological information relating to the holes was announced on 10th April (FDH) + 30th May (GCZ). Assay information is tabulated below.





EL 1595 Holes FDH002 and FDH003 Assay Results							
Hole and Sample Number	From (m)	To (m)	Interval (m)	Gold (g/t)	Silver (g/t)	Zinc (ppm)	Arsenic (ppm)
FDH002-1	15.45	16.8	1.35	0.05	0.0	97	57
FDH002-2	19.7	20.07	0.37	8.69	1.0	193	4110
FDH003-1	18.5	19.2	0.7	0.05	1.2	1850	54
FDH003-2	33	33.5	0.5	0.01	0.0	111	8
FDH003-3	35.9	37.1	1.2	0.70	2.5	1500	84
FDH003-4	37.1	37.8	0.7	0.41	2.9	994	160
FDH003-5	38.6	40.1	1.5	1.20	8.0	7830	4
FDH003-6	40.1	41.3	1.2	0.15	1.6	1870	5
FDH003-7	44.3	44.9	0.6	0.20	3.3	3830	6
FDH003-8	44.9	47.3	2.4	0.02	0.0	229	8

EL 1595 - BULAGO DRILLING INFORMATION							
Hole ID	Co-ordinates (AMG066)			Azimuth °		Inclination (degrees)	End of Hole Depth (m)
	Northing	Easting	RL (m)	(AMG)	(MN)		
FDH001	9,400,202	637,024	1,619	30	25	-40	22.9
FDH002	9,400,201	637,024	1,619	30	25	-60	23.6
FDH003	9,400,200	637,024	1,619	30	25	-80	47.1
FNT Swit Kai Central Lower Zone (SUG002 Pad) Total Meters of Drilling							93.6

EL 1595 Hole GZC001 Assay Results						
Sample Number	From (m)	To (m)	Interval (m)	Gold (g/t)	Copper (ppm)	Moly (ppm)
650007	25	28	3	0.04	488	0
650008	28	31	3	0.03	256	0
650009	31	34	3	0.03	277	0
650010	34	37	3	0.04	439	7
650011	37	40	3	0.04	472	6
650012	40	43	3	0.05	287	5
650013	43	46	3	0.05	501	21
650014	46	49	3	0.06	460	20
650015	49	52	3	0.04	316	7
650016	52	55	3	0.06	369	0
650017	55	58	3	0.05	315	18
650018	58	61	3	0.02	152	5
650019	61	64	3	0.05	372	11
650020	64	67	3	0.04	323	10
650021	67	70	3	0.04	259	32
650022	70	73	3	0.04	277	10
650023	73	76	3	0.05	377	5
650024	76	79	3	0.08	544	8
650025	79	82	3	0.07	384	8
650026	82	85	3	0.07	276	34
650027	85	88	3	0.03	175	5

EL 1595 Hole GZC002 Assay Results						
Sample Number	From (m)	To (m)	Interval (m)	Gold (g/t)	Copper (ppm)	Moly (ppm)
650041	7.8	10.6	2.8	0.07	187	3
650042	10.6	13.0	2.4	0.16	1644	2
650043	13.0	16.0	3.0	0.07	417	4
650044	16.0	19.0	3.0	0.18	1027	13
650045	19.0	22.0	3.0	0.04	301	6
650046	22.0	25.0	3.0	0.10	424	3
650047	25.0	28.0	3.0	0.08	479	4
650048	28.0	31.0	3.0	0.22	335	2
650049	31.0	34.0	3.0	0.05	342	6
650050	34.0	37.0	3.0	0.05	393	7
650051	37.0	40.0	3.0	0.07	376	3
650052	40.0	43.0	3.0	0.06	170	6
650053	43.0	46.0	3.0	0.05	138	8
650054	46.0	49.0	3.0	0.06	287	5
650055	49.0	52.0	3.0	0.06	484	8
650056	52.0	55.0	3.0	0.05	368	8
650057	55.0	58.0	3.0	0.04	326	8
650058	58.0	61.0	3.0	0.07	499	24
650059	61.0	64.0	3.0	0.03	316	18
650060	64.0	67.0	3.0	0.02	343	10
650061	67.0	70.0	3.0	0.02	245	5
650062	70.0	73.0	3.0	0.03	249	8
650063	73.0	76.0	3.0	0.06	184	7
650064	76.0	79.0	3.0	0.10	528	15
650065	79.0	82.0	3.0	0.03	425	11
650066	82.0	85.0	3.0	0.20	165	12
650067	85.0	88.0	3.0	0.06	215	6
650068	88.0	91.0	3.0	0.12	144	3
650069	91.0	94.0	3.0	0.09	394	21
650070	94.0	97.0	3.0	0.07	132	7
650071	97.0	100.0	3.0	0.08	192	8
650072	100.0	103.0	3.0	0.17	340	6
650073	103.0	106.0	3.0	0.03	207	10
650074	106.0	109.0	3.0	0.06	316	18
650075	109.0	112.0	3.0	0.04	209	9
650076	112.0	115.0	3.0	0.06	220	23
650077	115.0	118.0	3.0	0.08	360	35
650078	118.0	121.0	3.0	0.03	161	10
650079	121.0	124.0	3.0	0.04	230	10
650080	124.0	127.0	3.0	0.02	218	10
650081	127.0	130.0	3.0	0.02	80	11
650082	130.0	133.0	3.0	0.04	254	20
650083	133.0	136.0	3.0	0.08	115	9
650084	136.0	139.0	3.0	0.03	198	6
650104	139.0	142.0	3.0	0.04	451	0
650105	142.0	145.0	3.0	0.01	201	6
650106	145.0	148.0	3.0	0.36	165	0
650107	148.0	151.0	3.0	0.02	179	0
650108	151.0	154.0	3.0	0.11	494	0
650109	154.0	157.0	3.0	0.03	442	9
650110	157.0	160.0	3.0	0.02	275	6
650111	160.0	163.0	3.0	0.02	208	8
650112	163.0	166.0	3.0	0.03	242	5
650113	166.0	169.0	3.0	0.04	255	5

650114	169.0	172.0	3.0	0.04	212	0
650115	172.0	175.0	3.0	0.03	268	0
650116	175.0	178.0	3.0	0.05	290	0
650117	178.0	181.0	3.0	0.04	407	8
650118	181.0	184.0	3.0	0.04	385	0
650119	184.0	187.0	3.0	0.04	514	0
650120	187.0	190.0	3.0	0.05	344	0
650121	190.0	193.0	3.0	0.05	407	0
650122	193.0	196.0	3.0	0.06	634	0
650123	196.0	199.0	3.0	0.07	559	0
650124	199.0	202.0	3.0	0.04	332	0
650125	202.0	205.0	3.0	0.05	314	9
650126	205.0	208.0	3.0	0.05	292	7
650127	208.0	211.0	3.0	0.07	469	0
650128	211.0	214.0	3.0	0.06	439	18
650129	214.0	217.0	3.0	0.04	498	32
650130	217.0	220.0	3.0	0.06	452	12
650131	220.0	223.0	3.0	0.09	288	16
650132	223.0	226.0	3.0	0.06	640	0
650133	226.0	229.0	3.0	0.05	564	8
650134	229.0	232.0	3.0	0.06	463	6
650135	232.0	234.3	2.3	0.07	561	16
650136	234.3	235.8	1.5	0.05	171	20
650137	235.8	237.3	1.5	0.06	53	10
650138	237.3	238.8	1.5	0.06	216	15
650139	238.8	240.3	1.5	0.07	420	7
650140	240.3	241.8	1.5	0.01	111	6
650141	241.8	243.3	1.5	0.02	87	9
650142	243.3	244.8	1.5	0.03	68	24
650143	244.8	246.3	1.5	0.03	121	17
650144	246.3	247.8	1.5	0.04	235	15
650145	247.8	249.3	1.5	0.02	85	12
650146	249.3	250.8	1.5	0.02	165	12
650147	250.8	252.3	1.5	0.05	288	33
650148	252.3	253.8	1.5	0.02	47	26
650149	253.8	255.3	1.5	0.02	60	18
650150	255.3	256.8	1.5	0.02	17	8
650151	256.8	258.3	1.5	0.02	105	28
650152	258.3	259.8	1.5	0.02	183	11
650153	259.8	261.1	1.3	0.02	20	5
650154	261.1	264.0	2.9	0.15	307	0
650155	264.0	267.0	3.0	0.03	60	11
650156	267.0	270.0	3.0	0.04	396	7
650157	270.0	273.0	3.0	0.06	415	9
650158	273.0	276.0	3.0	0.04	339	18
650159	276.0	279.0	3.0	0.03	48	18
650160	279.0	282.0	3.0	0.03	100	8
650161	282.0	285.0	3.0	0.04	170	30
650162	285.0	288.0	3.0	0.05	365	15
650163	288.0	291.0	3.0	0.04	100	10
650164	291.0	294.0	3.0	0.04	117	6
650165	294.0	297.0	3.0	0.05	81	9
650166	297.0	300.0	3.0	0.03	145	9
650167	300.0	303.9	3.9	0.03	143	0

Hole ID	Approx. Co-ordinates (AMG066)			Azimuth °		Inclination (degrees)	End of Hole Depth (m)	Comments
	Northing	Easting	RL (m)	(AMG °)	(MN °)			
GCZ001	9399403N	0639382E	1,675	55	50	-50	88.2	Abandoned caving
GCZ002	9399403N	0639382E	1,675	55	50	-60	303.9	Cased, HQ, to 105.8m, NQ to EOH

## RECONNAISSANCE GOLD EXPLORATION RESULTS

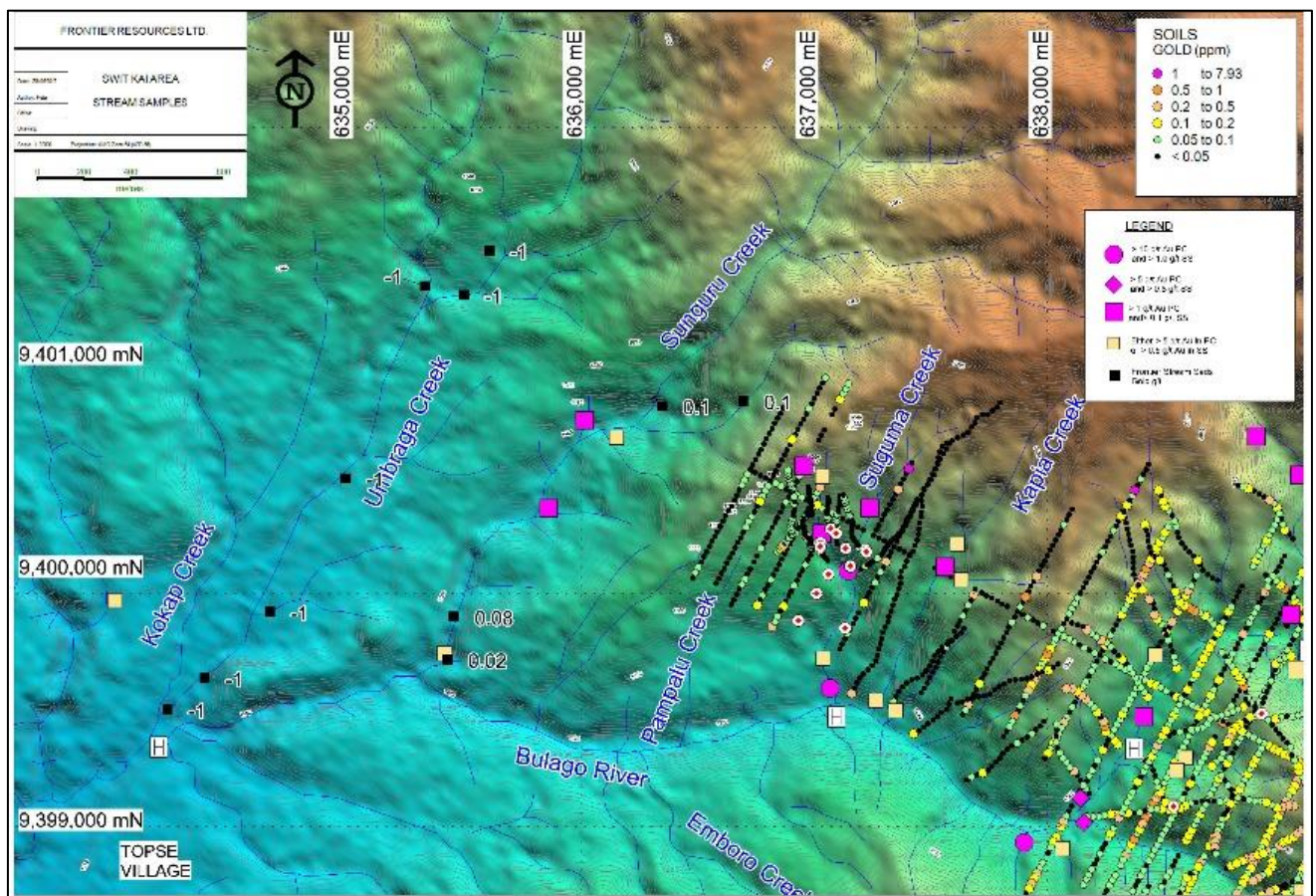
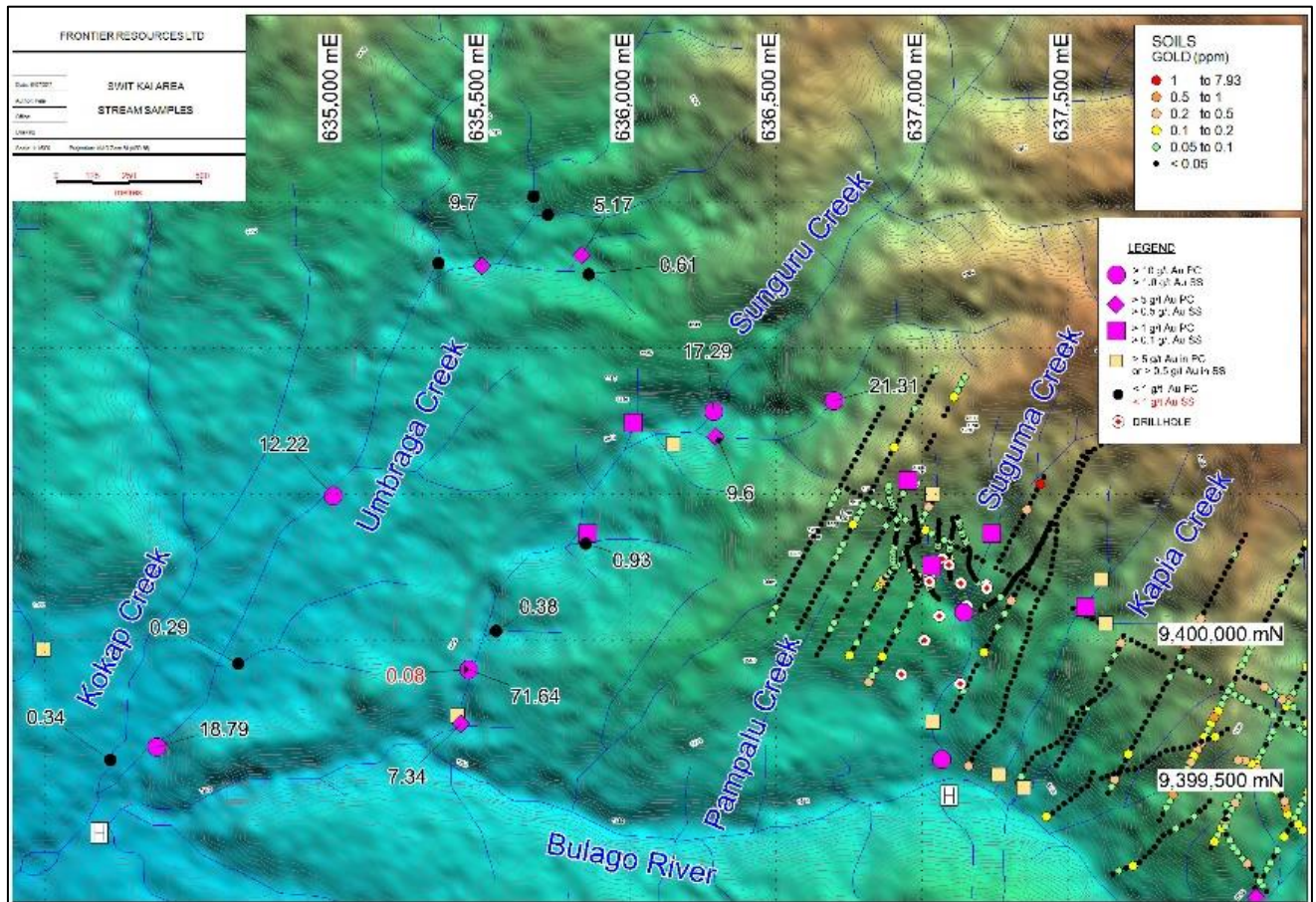
Reconnaissance stream sampling to the west and northwest of Swit Kai Prospect (EL 1595 -Bulago) has demonstrated strong gold anomalies in panned concentrate and silt samples. This exploration has significantly increased the EL's total gold anomalous drainage area and given us new areas to evaluate further for potentially economic mineral resources.

The reconnaissance program proved there is gold but apparently no copper anomalies in the region W and NW of the Swit Kai Prospect. Some of these drainage anomalies are related to the western Swit Kai strike extensions, but others must represent different zones of gold mineralisation. Additional reconnaissance drainage sampling is required to track the gold anomalies to their sources. Recon is still required north of Swit Kai, in the drainages of the Sunguru Skarn Magnetic Anomaly and at all the skarn targets around the limestone/ intrusive/sediment contact. Frontier's project portfolio still has many high-priority targets for evaluation.

Three possible long holes in the Bulago Valley were proposed, but due to the steep terrain, no suitable site could be immediately located in the vicinity of P1. As such, proposed hole P2 pad was surveyed and cut (with the rig to move to it), until it was deemed unstable and needed more clearing work. Pad P3 already existed and timing and logistics dictated we drill P3, which was only weakly mineralised.

There is a minimum of 4 additional high priority, long holes proposed to test large-scale copper- gold targets in the Bulago Valley (P1 and P2), between them and Swit Kai (on the largest /strongest arsenic anomaly on the grid) and the proposed Bulago River or gold Structure (south of Swit Kai).





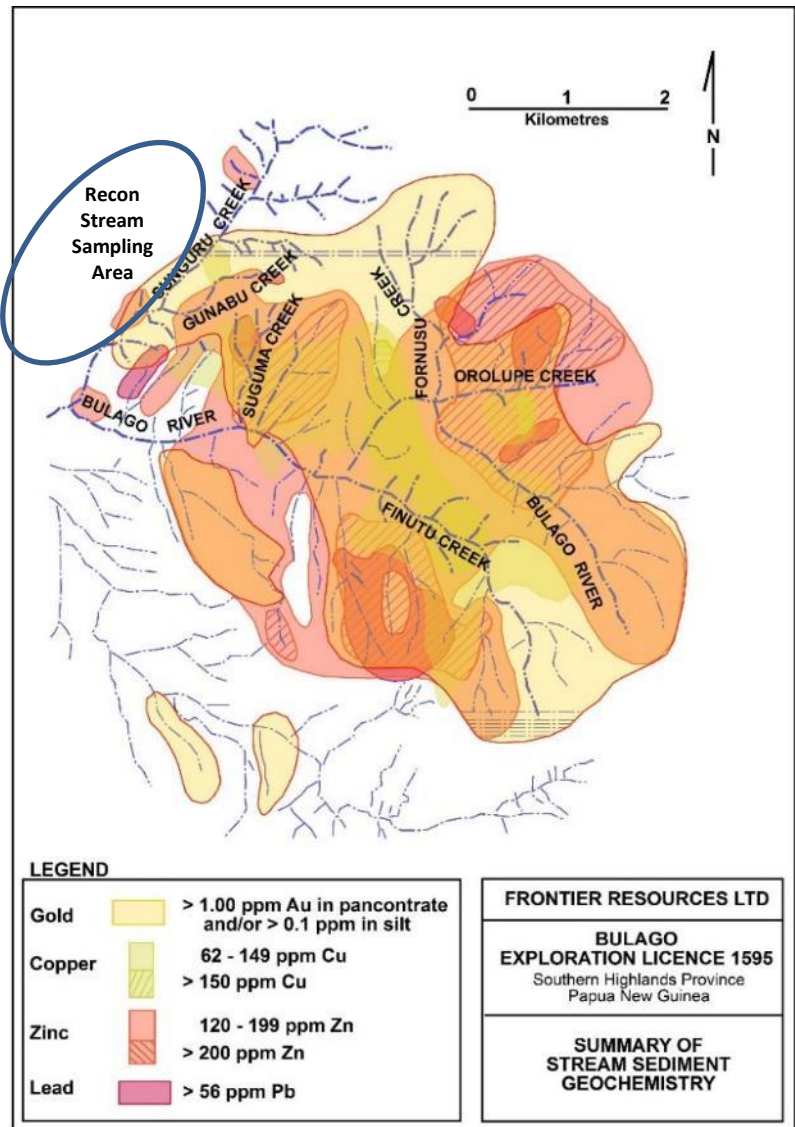
Seventeen Bulago panned concentrate samples are tabulated below with the assay and contained micrograms of gold within the concentrate. Another table lists the 17 panned concentrate samples with corresponding 12 silt samples from the same sites. A total of 11 float rocks were collected and numbers 18 and 20 demonstrated weak gold, while other samples exhibited anomalous copper, silver, arsenic and zinc. Peak values for the Bulago recon were 71.6 g/t gold and 382 micrograms gold in panned concentrate, 0.10 g/t gold in silt and 0.14 g/t gold in float rock.



Drainage Sample Information					
Number	Type	Gold Assay (g/t)	PC Gold (Micrograms)	Easting (m)	Northing (m)
SUN001	PC	7.34	26.8	635422	9399716
SUN002	SS	0.02	NA	635422	9399716
SUN003	PC	0.38	1.2	635550	9399700
SUN004	PC	0.93	2.2	635600	9399700
SUN005	PC	71.64	382.4	635450	9399900
SUN006	SS	0.08	NA	635450	9399900
SUN009	PC	17.29	103.0	636344	9400803
SUN010	SS	0.10	NA	636344	9400803
SUN011	PC	9.60	23.8	636324	9400755
SUN012	SS	0.02	NA	636324	9400755
SUN016	PC	21.31	61.0	636692	9400825
SUN017	SS	0.10	NA	636692	9400825
SUN023	PC	0.34	2.7	634221	9399501
SUN024	SS	<0.01	NA	634221	9399501
SUN025	PC	18.79	199.9	634382	9399636
SUN026	SS	<0.01	NA	634382	9399636
SUN028	PC	0.29	2.1	634660	9399920
SUN029	SS	<0.01	NA	634660	9399920
SUN030	PC	12.22	18.6	634986	9400493
SUN031	SS	<0.01	NA	634986	9400493
SUN032	PC	0.02	0.1	635328	9401318
SUN033	SS	<0.01	NA	635328	9401318
SUN034	PC	9.70	36.4	635494	9401280
SUN035	SS	<0.01	NA	635494	9401280
SUN036	PC	0.61	2.9	635769	9401257
SUN037	PC	5.17	14.4	635768	9401326
SUN038	PC	0.01	0.0	635685	9401434
SUN039	PC	0.09	0.4	635602	9401471
SUN040	SS	<0.01	NA	635602	9401471

EL 1596 Reconnaissance Rock Assay Results						
Sample Number	Gold (g/t)	Copper (ppm)	Arsenic (ppm)	Moly (ppm)	Silver (g/t)	Zinc (ppm)
SUN007	-	48	5	-	-	23
SUN008	-	35	6	-	-	49
SUN013	0.01	84	9	-	-	22
SUN014	0.02	376	7	20	0.7	46
SUN015	0.02	148	8	-	-	177
SUN018	0.11	101	8	-	-	21
SUN019	0.06	32	63	-	-	17
SUN020	0.14	367	12	-	-	109
SUN021	0.05	151	-	-	-	84
SUN022	0.05	220	6	-	-	76
SUN027	-	-	-	-	-	55

Sample Number	Contained Gold (Micrograms)	Gold Assay (g/t)	Sample Weight (grams)
SUN001	26.8	7.34	36.5
SUN003	1.2	0.38	31.8
SUN004	2.2	0.93	23.6
SUN005	382.4	71.64	53.4
SUN009	103.0	17.29	59.6
SUN011	23.8	9.60	24.8
SUN016	61.0	21.31	28.6
SUN023	2.7	0.34	80.4
SUN025	199.9	18.79	106.4
SUN028	2.1	0.29	74.1
SUN030	18.6	12.22	15.2
SUN032	0.1	0.02	56.3
SUN034	36.4	9.70	37.5
SUN036	2.9	0.61	47.9
SUN037	14.4	5.17	27.9
SUN038	0.0	0.01	23.7
SUN039	0.4	0.09	38.6



At nearby EL 2356 – Muller, the very brief recon program at Tinga only collected 13 samples a long way from the copper /potassic alteration zone. Somehow, rock samples 1-6 were left at Bulago, but weak gold, copper and arsenic was demonstrated in samples FT007-013. Frontier now has a rapport with the Tinga landowners and will establish a base camp in October, after the wet season in anticipation of drilling the potassic core or Joint venturing the property.

#### OPTION AGREEMENT SIGNED FOR JOINT VENTURE ON ANDEWA EL

An Option Agreement Frontier was signed with WNB Resources Ltd (WNB - a PNG registered company that is wholly owned by Frontier's Chairman Peter McNeil).

The Option relates to WNB's Andewa Exploration Licence (EL 2461), in West New Britain Province, Papua New Guinea and records a number of principles that will apply to a Proposed Joint Venture at the end of the Option period on 16/11/2018, including:

- Frontier will earn a 90% interest in EL 2461 - Andewa by spending a minimum of A\$50,000 on exploration in 2017 and in 2018 (the Option Period), including reimbursement of A\$30,000 exploration costs.
- WNB will be 9.9% free-carried interest to point of profitable production on each Mining lease granted within the original boundaries of EL 2461.
- The Option Agreement is binding on WNB, but Frontier may elect to withdraw from it at any time.
- The Joint Venture Agreement will be based on the Principles noted herein and is subject to obtaining necessary Frontier shareholder, Australian and PNG regulatory approvals.
- Frontier will manage and WNB will operate the exploration programs for a standard Management fee (10%). Frontier can assume project operation after a JORC compliant Indicated Resource is estimated.

**Highlights Relating to the Andewa Project are:**

- ✓ Bulk porphyry gold and vein gold targets at Andewa expressed as several square kilometres of strongly anomalous gold and copper in grid based soils, with large and deep 3D IP and resistivity anomalies.
- ✓ High grade gold drill intercepts including 1.5m of 39.3 g/t, 1.0m of 18.4, 5.9m of 13.1 g/t, 10.8m of 7.0 g/t
- ✓ Low grade generally entire drill holes including 993.3m of 0.10 g/t gold, 106.6m of 0.75 g/t + 0.30% copper, 114.0m of 0.74 g/t + 0.20% copper, 409.1m of 0.30 g/t, 404.6m of 0.24 g/t and 403.5m of 0.27 g/t gold.

**Highlights Relating to the Stoneleigh Project are:**

- ✓ Porphyry copper-gold, epithermal gold and skarn targets in a 5.6 km diameter circular feature, with a ~40 km<sup>2</sup> window of weak molybdenum mineralised volcanics in limestone on a major crustal structure.
- ✓ Effectively no exploration has been conducted over this prospect. BHP collected 36 recon samples with copper >0.1% in two different rock types (0.1% was the analysis maximum), with effectively all the samples molybdenum and arsenic anomalous with trace gold, showing proximity to a porphyry copper system.
- ✓ Five different mineralised rock types sampled plus epithermal vein quartz and strong silicification.
- ✓ Arsenic and gold anomalous stream sediment samples occur throughout the prospect and eight stream panned concentrate samples reported visible gold.

Non-Executive Director, Peter Swiridiuk (geophysicist) commented:

*The Andewa property was the first EL ever granted to Frontier Resources in PNG in 2004. The Company explored the area and Joint Ventured it to Newcrest Mining Ltd (2012/2013), who withdrew after A\$8 million exploration / drilling of the \$20 million earn -in requirement. Frontier subsequently lost the EL and reapplied for it in 2015, but it was not granted.*

*Frontier's Chairman Peter McNeil applied for a different area but also covering the main former Andewa EL, via his private Company WNB Resources in mid-2016 (with my full knowledge) and it was granted in mid-November.*

*Andewa is an excellent gold project, but in addition, the Stoneleigh probable porphyry copper-gold, epithermal gold and polymetallic skarn region has never been explored; it has recently been dissected by logging related bulldozer tracks, so access is now fantastic for exploration /evaluation and possible future development opportunities.*

*It is much easier and more cost effective to explore /operate in New Britain than in the Highlands. After we finish our current drilling at Bulago in a few weeks, we will not have a project to work on until October (due to the wet season at Bulago/Muller), and Andewa fulfils the Company's requirements perfectly.*

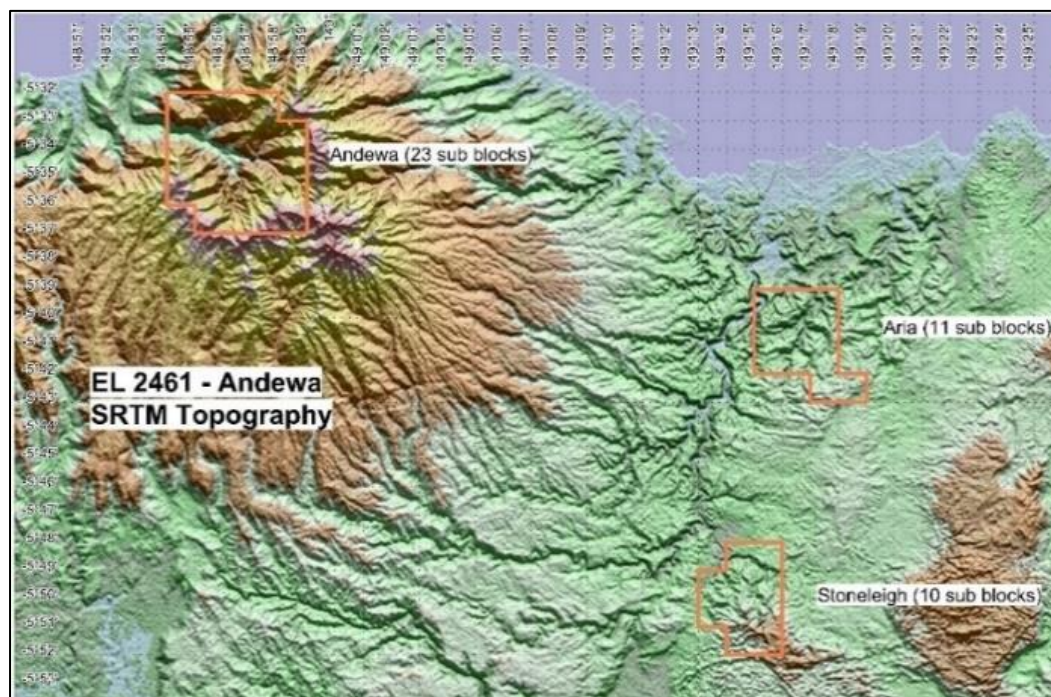
*I am excited that Frontier has concluded an Option with WNB to obtain a 90% equity in the Andewa / Stoneleigh Projects for an outstanding consideration, so we can unlock the area's excellent mineralisation potential. I believe Frontier will get excellent value plus an immediate upside from these projects and recommend shareholders approve the transaction when requested. A 2-week reconnaissance exploration program is planned to commence forthwith at Stoneleigh.*



**A Summary of the Andewa EL is included below and a Comprehensive Report has been posted on the website.**

The 147 km<sup>2</sup> Andewa Exploration Licence (43 sub-blocks) was granted to WNB Resources Ltd on November 16 2016 for the normal renewable term of 2 years and is located in West New Britain Province, Papua New Guinea; it has excellent coastal and variable inland access to the 3 non-contiguous regions. There are 2 main prospect areas with excellent potential to yield significant gold and copper mineralisation with further exploration.

The Andewa Project is a major gold mineralised system centred on WNW, NNE and NW trending crustal level faults. The project has had deep and shallow drilling completed in multiple prospect areas with significant results and warrants a significant amount of further evaluation. Andewa is highly prospective for narrow high-grade epithermal gold and bulk disseminated -porphyry type gold deposits.



The Stoneleigh Project is located at the intersection of WNW and ENE crustal level faults, that have produced a slightly contorted but very distinct circular feature in drainages and topography. The region has only had 2 days of basic reconnaissance completed and the 30 rocks and multiple panned concentrates collected showed it has excellent potential for epithermal and probably gold porphyry copper – gold-molybdenum deposits, plus skarns. Access is excellent due to substantial logging having been recently completed.

The Aria region has never been explored but consists of a distinct topographic circular feature in drainages and various Aster satellite anomalies that warrant evaluation.

Forty holes have been completed in total at Andewa for 12,531.6m, with eighteen for 9,907.9m from mid-2011 to late 2012 as part of the Newcrest JV, to depths of 1,000m targeting porphyry style gold and copper mineralisation. Gold and copper mineralisation are known to extend to >700m vertically with 2.0m of 3.95 g/t gold + 0.11% copper from 986 to 988m downhole and 2.6m grading 0.74 g/t gold + 6.4 g/t silver from 923.2 to 925.8m at end of hole.

Twenty holes were drilled at Komsen (AFD Series) in 2008 and 18 holes were drilled at Ehgin, Ekhos and elsewhere (ADH Series) in 2011/2012.

#### **High grade drill intercepts include:**

- 1.5m grading 39.3 g/t gold (from 450.0m- 451.5m downhole) - ADH013
- 1.0m grading 18.45 +10.3% zinc - AFD005 5.9m grading 13.07 g/t gold - AFD007
- 10.8m grading 6.99 g/t gold +12 g/t silver - AFD017
- 3.5m grading 6.51 g/t gold - AFD020

#### **Bulk low-grade drill intercepts include:**

- 106.6m grading 0.75 g/t gold + 0.30% copper - ADH001
- 114.0m grading 0.74 g/t gold + 0.20% copper - ADH002 (in multiple sections)
- 409.1m grading 0.30 g/t gold - ADH003
- 404.6m grading 0.24 g/t gold - ADH004

403.5m grading 0.27 g/t gold, incl. 5 narrow zones >1g/t gold -ADH008

993.3m grading 0.10 g/t gold, incl. 2.0m of 3.95 g/t gold + 0.11% copper at EOH - ADH017

20.0m grading 0.40 g/t gold + 0.25% copper, plus 173.0m grading 0.12 g/t gold + 0.10% copper - ADH012

79.4m grading 0.11g/t gold +0.10% copper (from 838.6m to 918.0m) - ADH014

12.0m grading 0.96 g/t gold - ADH016

18.6m grading 1.13 g/t gold - AFD019

Untested targets include high gold and silver assays related to structurally controlled, epithermal gold / silver mineralisation and other combinations to possible porphyry copper-gold-molybdenum.

Two highly significant gold mineralised outcrops were discovered and channel chip sampled, returning, 15.0m of 15.48 g/t gold + 21.9 g/t silver (sampled partly along strike), 11m of 5.44 g/t gold + 85 g/t silver + 0.22% copper (partly along strike). Also, 6m of 7.56 g/t gold plus 68 g/t silver plus 0.25% copper (central width) and 3m of 9.20 g/t gold plus 32 g/t silver plus 0.30% copper (SE end exposed width). Silver mineralised outcrop channel chip samples included 4.0m of 210.5 g/t silver plus 0.68 g/t gold plus 0.55 % zinc and 3.0m of 137 g/t silver plus 0.58 g/t gold. These areas all need additional exploration.

PNG and its northern islands are considered as part of the “Rim of Fire”, the active circum-Pacific volcanic belt that hosts many large porphyry copper-gold deposits and a number of world-class epithermal gold deposits. The islands off the north-east coast of Papua New Guinea include New Britain Island and host a chain of subduction-related Pleistocene to Holocene strato-volcanoes of calc-alkaline affinity, known as the Bismarck Island Arc.

The Mount Andewa volcano lies on the north coast of the West New Britain Province in Papua New Guinea and shows evidence of hydrothermal alteration in the rocks within its crater. Within the 9km wide crater of the extinct strato-volcano, multiple high-level gold prospects occur within a 7 km by 2.5 km zone and constitute the Ehgin, Komsem, Samarung, Ekhos, Ler and Kehedie Prospects.

EL 2461 covers an area of 80 sub-blocks for 286 km<sup>2</sup> and is located about 75 km west of Kimbe in West New Britain Province. The Mount Andewa section is situated on the northern coast and is centred on 5° 34' 00" S latitude and 148° 56' 30" E longitude on the Mucadha and Aria 1:100 000 topographic map sheets. The tenement is accessible both by sea and air.

Initial work in Andewa crater demonstrated stream sediment samples containing as much as 0.63 g/t Au and panned concentrate samples of 525µg (containing as much as 12.1 g/t Au) and led to the discovery of an 18 km<sup>2</sup> anomalous gold/arsenic surface zone. Within this supposedly fracture-controlled zone, soil samples (as much as 4.06 g/t Au), rock chip and float samples (as much as 58.4 g/t Au) and rock chip sampling in trenches (as much as 15.6m grading 5.12 g/t Au) have defined a >1,000m long mineralised vein system at the Komsem prospect.

A very large grid (approx. 21 sq km) was surveyed and cut for the geophysical and geochemical programs and a very large sulphide mineralised system was identified by 3D-IP chargeability anomalies from surface to >800m total depth, in three major but discrete zones.

- The Ekhos chargeability anomaly is 3.3 Km<sup>2</sup> in area (at 150m below sea level), which is larger than the Core Chargeability Zone (CCZ) (3.0 km<sup>2</sup>) and the Ber anomalies (approx. 0.5 km<sup>2</sup>).
- Ekhos is the largest and closest to surface 3D-IP chargeability anomaly at Andewa, with much of it very intense (>45ms).
- Each chargeability anomaly is surrounded by a sub-circular, high-resistivity anomaly that appears to merge near and/or off the edge of the grid, to become one ~ 6km diameter anomaly in the centre of the Mt Andewa caldera, representing probable silicification around the intrusions.
- There are strong correlations between known surficial gold and copper and the 3D-IP chargeability anomaly at Ekhos, however, most of that region has never been explored.
- The CCZ and Ekhos chargeability anomalies are connected by an east-west trending zone and the Ekhos and Ber anomalies are located at higher elevations above sea level (than the CCZ).

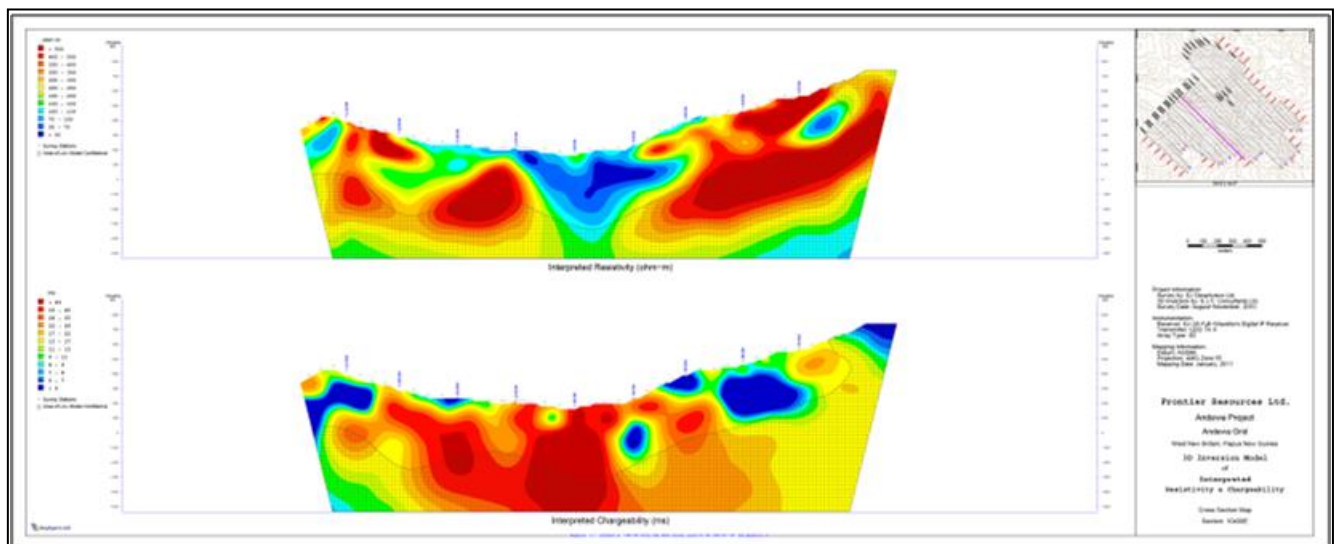
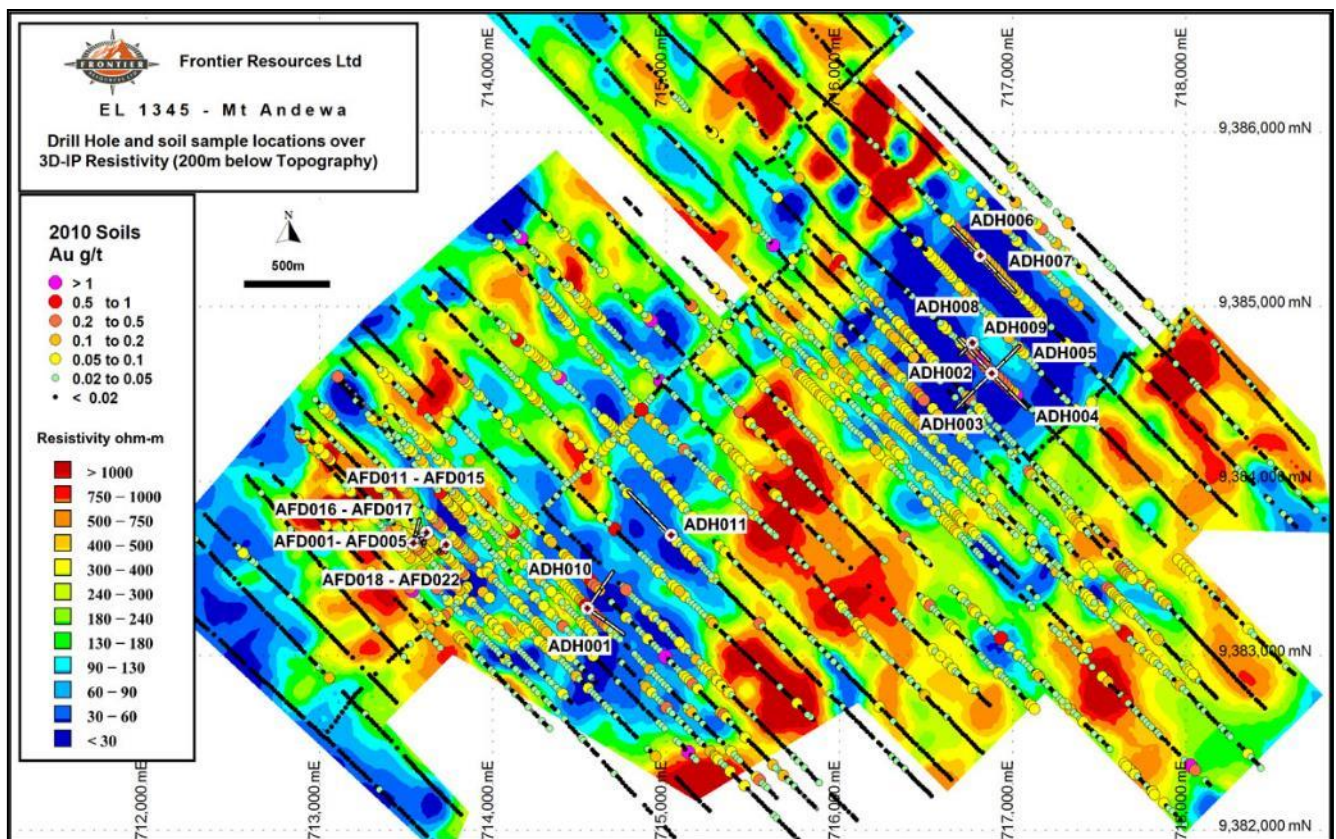
The 3D-IP survey showed 3 exceptionally voluminous and intense chargeability anomalies, indicating the presence of very large sulphide systems from on-surface to more than 800m deep. The total chargeability



anomaly (over 30ms) area is  $\sim 7 \text{ km}^2$ , consisting of two very large, spatially related and intense chargeability anomalies (plus one smaller anomaly) called the Core Chargeability (CCZ), Ekhos and Ber Zones. The Ekhos chargeability anomaly is  $3.3 \text{ Km}^2$  in area, the CCZ is  $3.0 \text{ km}^2$  and Ber is approximately  $0.5 \text{ km}^2$  (at 150m below sea level).

The total anomalous chargeability area is approximately 5,400m long (E-W) and 3,000 wide (N-S). The Ekhos chargeability anomaly is approximately 3,850m long x 1,750m wide. It averages about 1,000m wide and has a higher-grade chargeability core zone that is approximately 2,400m long and 1,000m wide (at over 30ms and 400m below topography). The CCZ is approximately 2,900m long (NW to SE) and a maximum of 2,100m wide, averaging 1,000m wide.

Ekhos is the largest and closest to surface 3D-IP chargeability anomaly at Andewa, with much of it very intense at over 45ms; it is open to the south and east but appears defined in general at depth. The CCZ chargeability anomaly is open to the south AND at depth, however, it's very intense core (over 45ms) appears to be adequately resolved. The CCZ also has large anomalous areas at over 45ms chargeability that extend to depths greater than the 800m modelled maximum.





Each major chargeability anomaly is surrounded by a sub-circular high-resistivity anomaly that appears to merge near the edge and off the grid, to become 1 x ~6km diameter quasi donut shaped resistivity anomaly in the centre of the Mt Andewa crater, with 'holes' present where the strong chargeability anomalies exist.

- Soil geochemical sampling was undertaken with approximately 4,500 samples collected. Rock channel chip sampling was conducted with ~500 samples collected and very encouraging high-grade gold, plus silver and copper was demonstrated in multiple outcrop rock channel assays.
- Numerous gold mineralised outcrops were discovered and sampled over the 21 sq km gridded area from the limited outcrops in creeks. Peak outcrop assay values were 23 g/t gold, 288 g/t silver, 0.919% copper (float rock), 114 ppm molybdenum, 1.61% lead and 3.59% zinc.

The most common rock type within the crater is andesites and basalts, a suite of pyroclastic lavas intruded in places by a series of pyroxene and hornblende rich rocks which intrude the volcanics. They are in turn intruded by late felsic dykes which appear to be the progenitor for the porphyry copper-gold-moly mineralisation within the crater. Reconnaissance mapping and sampling in the creeks indicate gold and copper mineralisation is structure controlled with the several dominant structural directions delineated. Four main regional structure sets have been mapped; they are the a) North West to south east (320-340), b) the east north east (50-80) and c) the north to south (350-020) trends and, d) east west (80-100). Subordinate fracture sets in the area are the east to west trend and north east to south west trend. The oldest of these structures appear to be the northwest (320-350) trend which also controls the flow of the Komsen River. This trend is offset in places by a north south (350-020) trend which appears to control much of the vein style mineralisation. Intrusive activity within the prospect may be related to the East North East (050-070) and North-West fracture set. The Ehgin prospect lies on an east north-east trend. The Komsen quartz reef is controlled by the east-west trending structures.

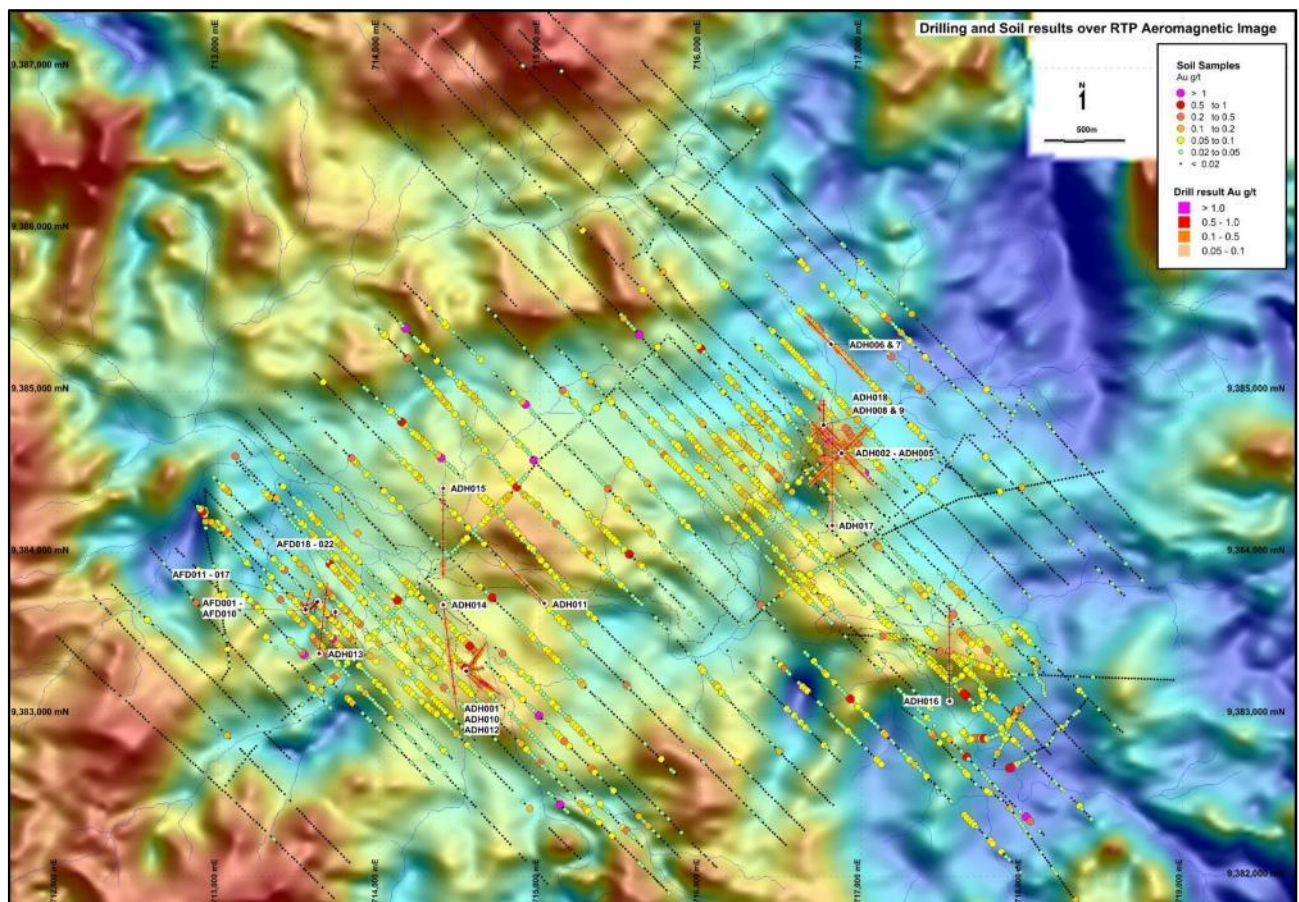
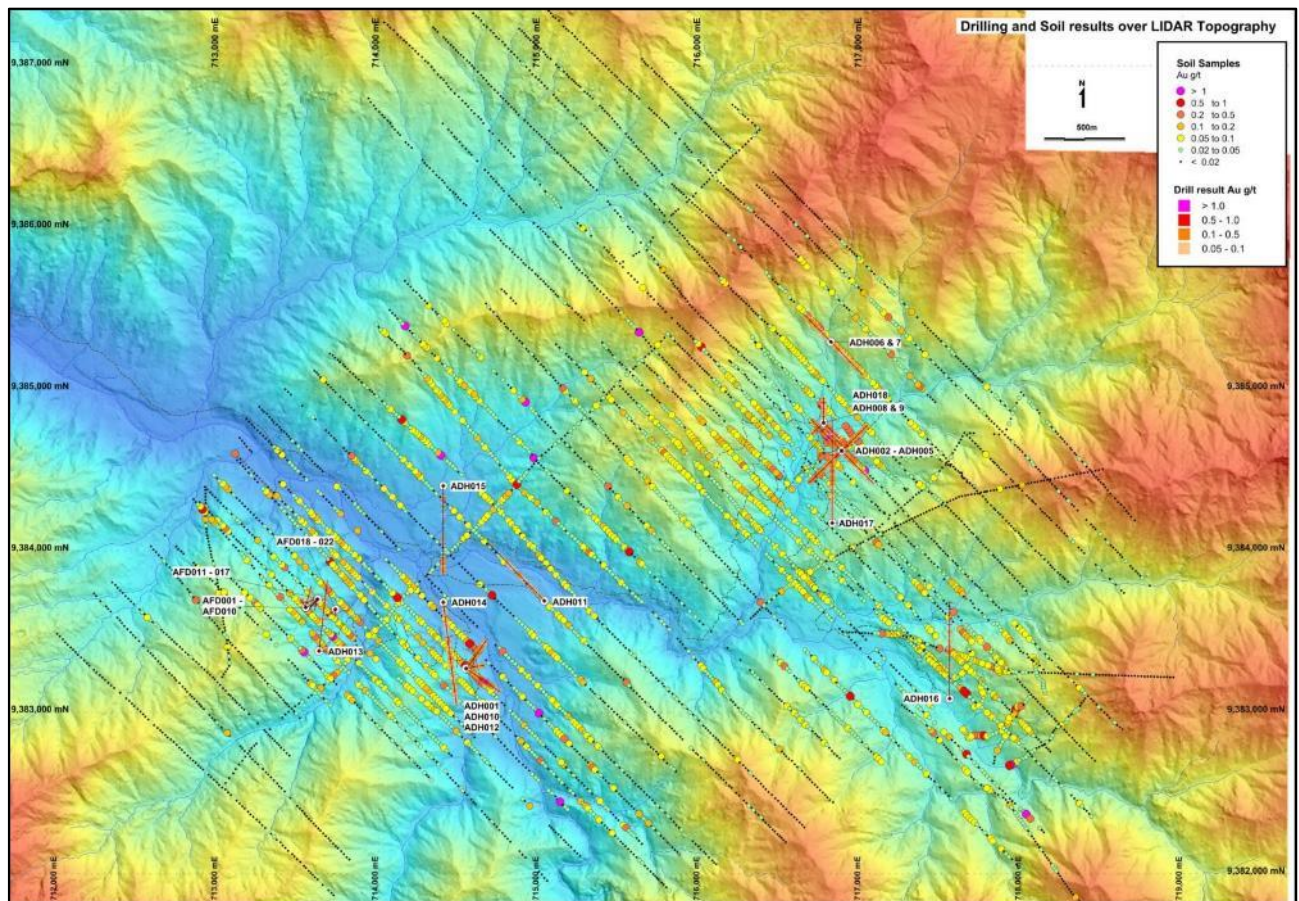
The creeks are dominated by a propylitic alteration assemblage which is ubiquitous and characterised by the presence of magnetite-carbonate-chlorite-epidote. Some of the disseminated pyrite is considered part of this alteration assemblage. The propylitic alteration is overprinted in places by a potassic assemblage that includes chlorite, magnetite, biotite, potassium-feldspars and anhydrite. This alteration style appears to be associated with the intrusive rocks, especially microdiorites and felsic dykes. Argillic alteration has been mapped in clay shears, in fracture zones and also associated with areas of extensive brecciation and limonite staining. It is characterised by the presence of clay-sericite-pyrite-fuchsite-manganese and limonite. Sometimes some argillic alteration is associated with areas of strongly oxidised weathering. Phyllic alteration is commonly associated with the presence of felsic dykes and intrusives and at intrusive contacts and is denoted by pyrite-clay-quartz-fuchsite and sericite.

Using results of a soil sampling program based on the grid cut for the IP survey, short hand trenches were conducted in areas with anomalous gold assays greater than 0.100g/t Au. At each sample point, hand trenches were cut 20m on either side of the anomalous sample. A total of 52 trenches were cut and many samples collected. Longer trenches were constructed in areas with continuous gold assays.

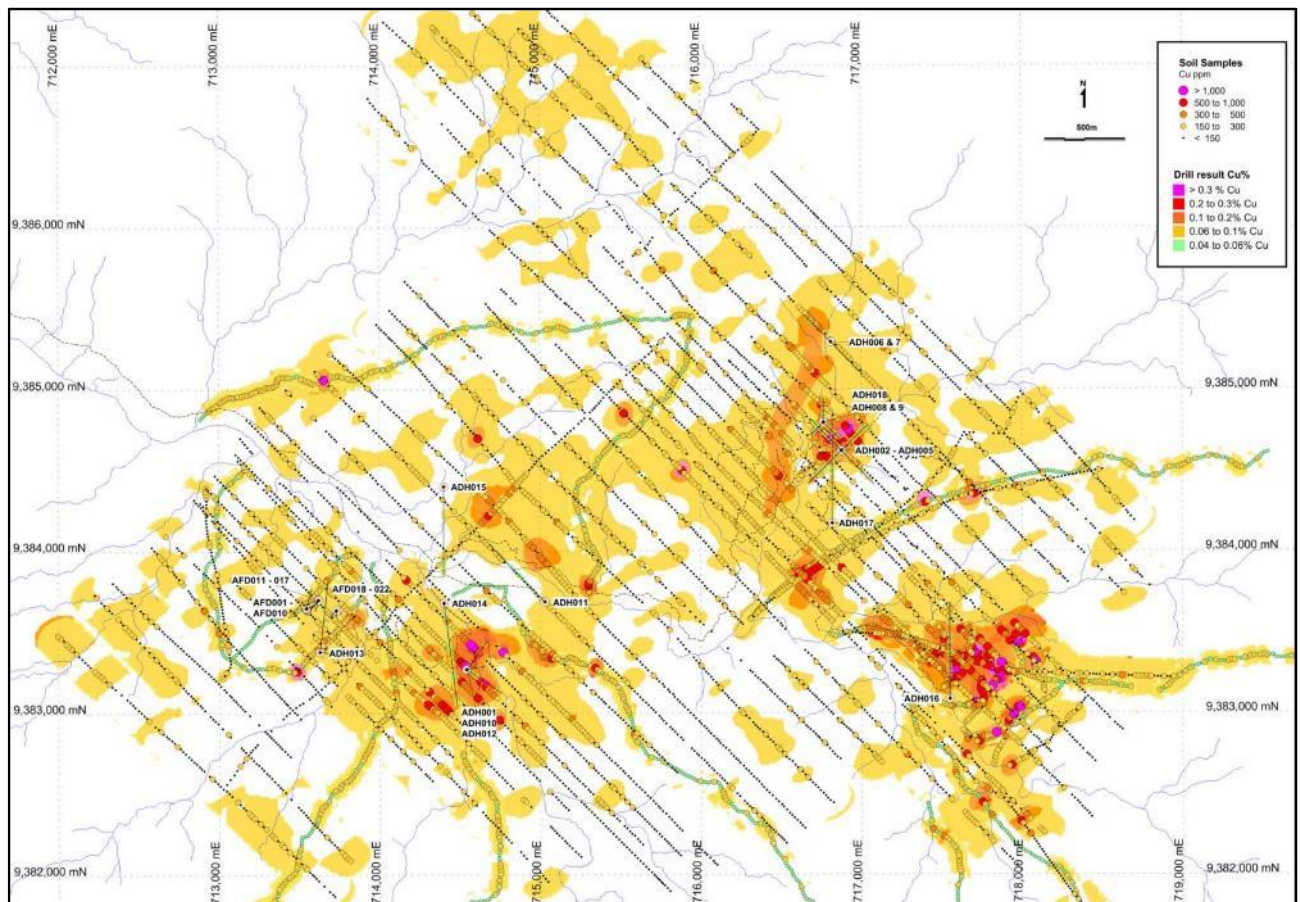
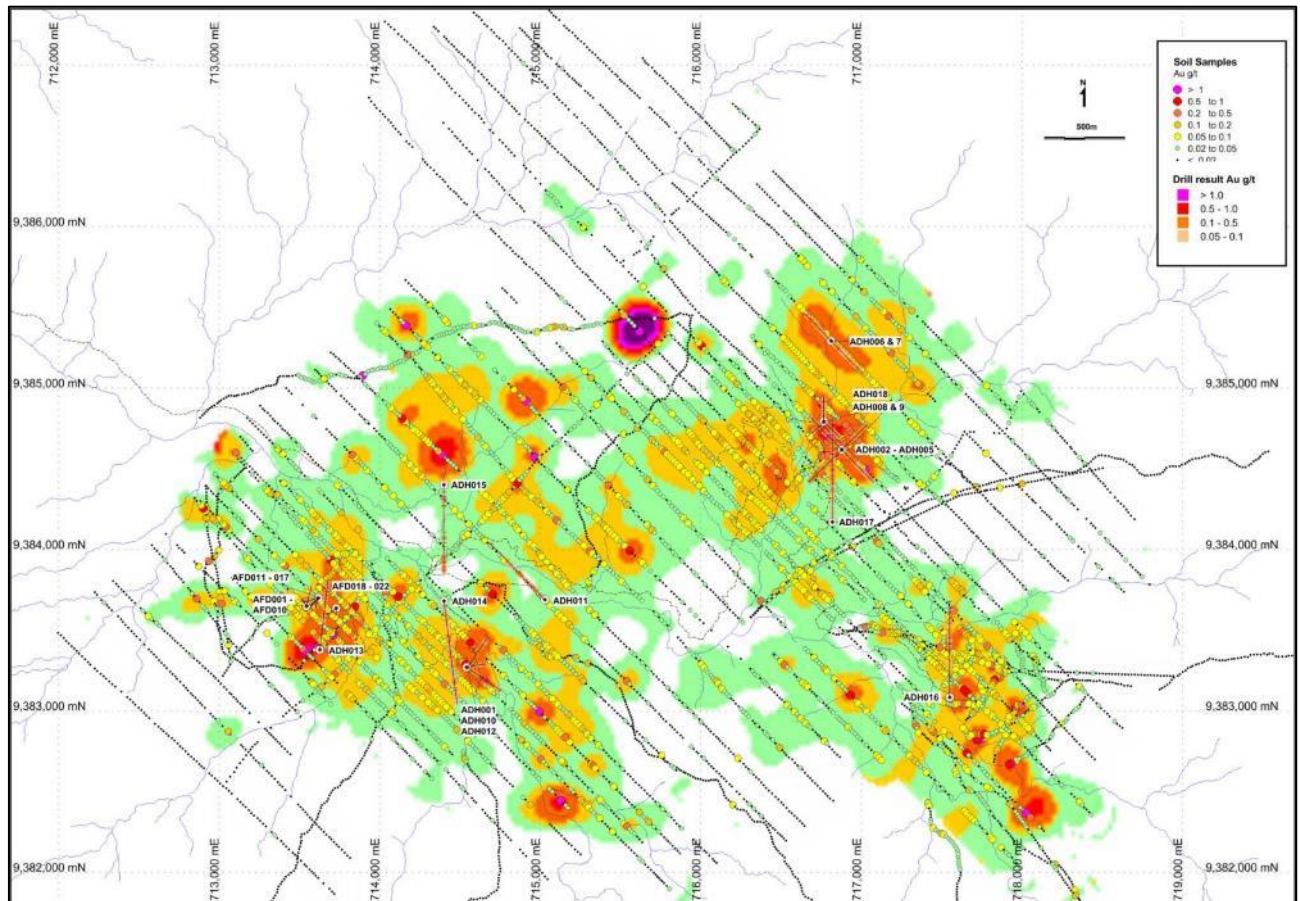
The access track from the coast was successfully pushed through to the Andewa base camp and thence to the Ehgin and Ekhos prospects. Road side cuts with good geological exposures were mapped and sampled as trenches. The results from the trenches were generally disappointing as most of the hand trenches were usually less than 1m deep and failed to penetrate into the bedrock. They were invariably terminated in the thick, poorly sorted and chaotic colluvium/scree that mantles most of the hill sides.

A low level airborne magnetic survey was conducted over the entire Andewa exploration licence. This survey was conducted by specialist geophysical consultants, Aeroquest Airborne in March, 2012. The survey was conducted using the WGS 84 coordinate system within zone 55 with line spacing of 100m and a sensor height of 60m from the ground up. The tie in line spacing was 1000m. A total of 1,538-line kilometres was completed. Magnetic data was collected during the survey along with radiometric information Thorium, Potassium and Uranium.









A total of 1,538-line kilometres was completed. Magnetic data was collected during the survey along with radiometric information Thorium, Potassium  
 Results from this aeromagnetic survey are very encouraging and confirmed areas of copper and moly anomalism in soil as magnetic highs (small) indicating possible intrusive activity. Major magnetic highs appear to be located



on the fringes of the immediate Andewa crater within the crater rim. The lows appear to correlate well with areas of strong structural activity.

Diamond drilling commenced July 1 2011 and was completed in late 2012. See the Table for a summary of drill results. A 2x rig diamond drilling program was initiated to drill test some of the IP chargeability and resistivity anomalies generated. The drilling program was initially started off by the smaller TGD 500 rig which completed 9 holes before two brand new rigs; the CS1800 and CS1800 were introduced. Drill holes were selected in areas with high chargeability/conductivity anomalies with corresponding coherent and anomalous gold, base metal and pathfinder element geochemistry. Drilling began at the Samarung prospect and continued up to Ehgin and Ekhos prospects.

Forty holes have been completed at Andewa in total for 12,531.6m, with eighteen for 9,907.9m since mid-2011. The Newcrest diamond core drilling program was terminated at Andewa in November 2012 with eighteen holes completed since the program commenced mid-2011, for a total of 9,892.9m, of which 4,632.4m was part of the Newcrest Joint Venture program (commencing 1/1/2012).

Holes ADH001, ADH010 and ADH012 drilled to the south of the main Andewa camp in an area of coherent IP chargeability and surface geochemistry had consistent copper mineralisation throughout the entire length of the hole. Holes ADH002-ADH005 drilled into an anomalous surface geochemical anomaly at the Ehgin

prospect returned encouraging fracture controlled, but porphyry related gold, copper and moly mineralisation. Holes ADH006 and ADH007 were drilled on the fringes of the geophysical anomaly at Ehgin and returned background values in copper mineralisation with occasional high gold values associated with the presence of quartz veins. Occasional elevated gold intervals associated with quartz veins were noted in holes ADH008 and ADH009 which were drilled closer to the anomaly at Ehgin.

The Komsem Prospect, was initially recognised as the principal target and it lies on the western side of the deeply dissected Mt Andewa crater and occupies a roughly circular area of alteration about 2.5 km in diameter. The Kehedie Prospect is a short distance east of the Komsen Prospect and may contain its strike-continuation.

Summary of Andewa ADH diamond drill hole gold, copper and moly intercepts							
Hole Number	Intercept Length	Gold (g/t)	Copper (%)	Moly. (ppm)	From (m)	To (m)	Nominal Gold Cut Off Grade
ADH001 incl.	398.8 m	0.35	0.15	8	0.0	398.8	Nil
	106.6 m	0.75	0.30	6	139.2	245.8	0.4
ADH002 Sum 6 zones= incl. and	372.0 m	0.36	0.10	9	0.0	372.0	Nil
	114.0 m	0.74	0.20	18	5.1	268.0	0.1
	19.0 m	1.86	0.39	14	154.0	173.0	0.5
	6.0 m	1.30	0.24	6	246.0	252.0	1.0
ADH003 incl. incl.	409.1 m	0.30	0.08	9	0.0	409.1	Nil
	7.3 m	2.16	0.11	3	46.8	54.1	0.5
	1.0 m	9.40	0.26	7	52.0	53.0	5.0
ADH004	404.6 m	0.24	0.06	9	0.0	404.6	Nil
ADH005	296.2 m	0.29	0.09	6	21.4	317.6	Nil
ADH006	353.5 m	0.13	0.02	2	0.0	353.5	Nil
ADH007	408.4 m	0.09	0.02	1	0.0	408.4	Nil
ADH008 incl. and and and and	403.5 m	0.27	0.05	5	0.0	403.5	Nil
	1.0 m	2.19	0.25	25	159.0	160.0	2.0
	1.5 m	2.06	0.23	3	196.5	198.0	2.0
	1.0 m	2.94	0.46	2	201.2	202.2	2.0
	2.2 m	1.10	0.14	2	226.0	228.2	1.0
	1.1 m	1.38	0.08	4	241.6	242.7	1.0
ADH009 incl. and	407.9 m	0.23	0.06	8	0.0	407.9	Nil
	9.3 m	0.72	0.14	2	219.7	229.0	0.3
	3.0 m	1.15	0.05	5	396.0	399.0	0.7
ADH010 incl.	332.0 m	0.21	0.16	13	0.0	332.0	Nil
	1.0 m	1.99	0.14	12	54.0	55.0	1.0
ADH011 incl. incl.	697.1 m	0.08	290	1	3.5	700.6	nil
	160.0 m	0.13	361	1	188	348	0.10
	2.0 m	2.24	227	3	226	228	2.00
ADH012 incl. plus	377.0 m	0.20	0.13	14	0.0	377.0	Nil
	20.0 m	0.40	0.25	20	347.0	367.0	0.3
	173.0 m	0.12	0.10	16	491.0	664.0	0.1
ADH013 incl. and and incl. incl.	625.5 m	0.19	0.02	1.6	0.0	625.5	Nil
	4.0 m	2.99	0.03	1.6	28.0	32.0	1.0
	2.0 m	1.89	0.02	2.1	57.6	59.6	1.0
	9.4 m	6.68	0.03	1.6	443.6	453.0	0.1
	3.0 m	20.41	0.05	2.9	448.5	451.5	1.0
	1.5 m	39.30	0.03	3.2	450.0	451.5	39.0
ADH014 and and	1,004.0 m	0.09	0.05	10.3	0.0	1,004.0	Nil
	2.0 m	1.55	0.06	7.4	392.0	394.0	1.00
	2.0 m	1.17	0.06	3.3	544.0	546.0	1.00
ADH015 incl. plus incl. plus	852.7 m	0.08	0.02	2.4	0.0	852.7	Nil
	2.0 m	1.34	0.09	2.3	130.0	132.0	1.00
	12.0 m	0.54	0.01	2.6	134.0	146.0	0.50
	2.0 m	1.26	0.01	1.9	142.0	144.0	1.00
ADH016 incl. incl. plus	2.0 m	1.00	0.03	0.9	502.0	504.0	1.00
	918.7 m	0.06	260	4	7.1	925.8	nil
	12.0 m	0.96	379	3	706.4	718.4	0.20
	2.0 m	3.93	752	11	706.4	708.4	1.00
ADH017 plus	5.6 m	0.50	224	2	923.2	925.8	0.50
	993.3 m	0.10	0.03	4	7.1	1000.4	nil
ADH018 incl.	2.0 m	3.95	0.11	1	986.0	988.0	3.0
	238.2 m	0.12	541	5	1.5	239.7	nil
	18.0 m	0.37	0.15	8	182.0	200.0	0.10

The Ekhos Prospect is approximately 1 km x 2 km in area and lies in the south-eastern sector of the crater. The Ehgin prospect lies on the north-eastern part of the crater just in the shadows of Mt. Andewa. The Samarung prospect consists of the camp area and most of the flat area within the centre of the crater. This area is referred to in some reports as “the great depression”.

A continuous programme of mapping, sampling and drilling by Frontier Resources Ltd, has refined knowledge of the Komsen, Kehedie and Ekhos Prospects, which have been defined more closely as potential hosts for gold in epithermal vein systems trending east to southeast. The mineralisation at the Komsen and Ekhos Prospects is interpreted as bi-phasal, with an early, high-temperature propylitic event, thought related to intrusion of a porphyry, being overprinted by a phyllic event related to the epithermal mineralisation.

Drill intersections in 2008 defined an east-striking, steeply north-dipping vein system at the Komsen Prospect, within the broader zone of alteration, and drill-cores have indicated that, locally, grades as high as 35g/t can occur. Sphalerite and galena have also been found in veins in the trenches here and in the Kehedie Prospect area, and sphalerite, galena, chalcopryrite, pyrite and silver (together with stibnite and arsenious minerals) have been reported from the drill-core.

During the 2010/2011 year, an extensive grid (approx. 21 sq km) was surveyed and cut for a 3D-IP geophysical and soil geochemical exploration program. Soil and rock geochemical sampling was undertaken and approximately 4,500 grid based soils and 500 rock-chip samples were collected.

The data allowed a comprehensive geological, geochemical and geophysical assessment of the Andewa gold mineralised system and high-quality, coherent and coincident anomalies were defined for further evaluation/ drill testing.

Hand Trench Number	Intercept Length and Grade	Total Trench Length	Comments
Central Komsen SPZ 2	21.6m of 4.41 incl. 2m of 24.22	26.6m	>1.0 g/t at one end + <u>Visible Gold</u>
Central Komsen B2	4.0m of 6.35 incl. 3.0m of 8.28	4.0m	>16.0 g/t and >0.5 g/t at ends
Central Komsen C4 OC2	8.0m of 3.14 incl. 2.0m of 9.34 plus 1.0m of 4.55	8.0m	>4.0 g/t at each end
Central Komsen SPZ 3	11.5m of 0.91 incl 2.0m of 1.70 plus 2.0m of 1.69	20.5m	<u>Visible Gold</u>
Central Komsen C4	4.5m of 2.23	4.5m	>1.0 g/t at both ends
Central Komsen C5	7.0m of 0.48 incl. 1.0m of 1.02 plus 1.0m of 1.4	7.0m	>1.0 g/t and >0.1 g/t at ends
Central Komsen SPZ 1	1.4m of 1.14	3.4m	>1.0 g/t at one end
Central Komsen SPZ 4	10.5m of 0.15	12.0m	>0.1 g/t at one end
Central Komsen SPZ 5	6.0m of 0.46 incl. 1.0m of 1.45	6.0m	>0.1 g/t at both ends
Central Komsen B1 Vn1	0.9m of 0.57	5.9m	>0.1 g/t at one end
Central Komsen B3 Vn2	7.1m of 0.38 incl. 2.3m of 0.66	7.1m	>0.1 g/t at both ends
E.Kehedie	32.7m of 0.66 incl. 1.4m of 0.59 plus 2.4m of 1.0 plus 15.3m of 1.07 plus 2.0m of 0.50 plus 2.0m of 0.73	32.7m	>0.5 g/t at both ends, <u>Visible Gold</u>
W.Kehedie 2	5.3m of 2.04 incl. 1.0m of 9.43	5.3m	>0.5 g/t and >0.1 g/t at ends
W Kehedie	1.1m of 0.51	4.5m	>0.1 g/t at one end
Central Ler T1 OC 2	4.0m of 2.63 incl. 1.0m of 9.89	4.0m	>0.1 g/t at both ends
Central Ler T1 OC2	3.9m of 0.66	3.9m	>0.1 g/t at both ends
W Ler	1.0m of 1.66	42.0m	weakly anomalous throughout
TBL	2.0m of 2.43 incl. 1.0m of 3.95	5.0m	>0.1 g/t at both ends
TBL	2.0m of 1.38	13.0m	

NB: Silver sporadically to 43 g/t

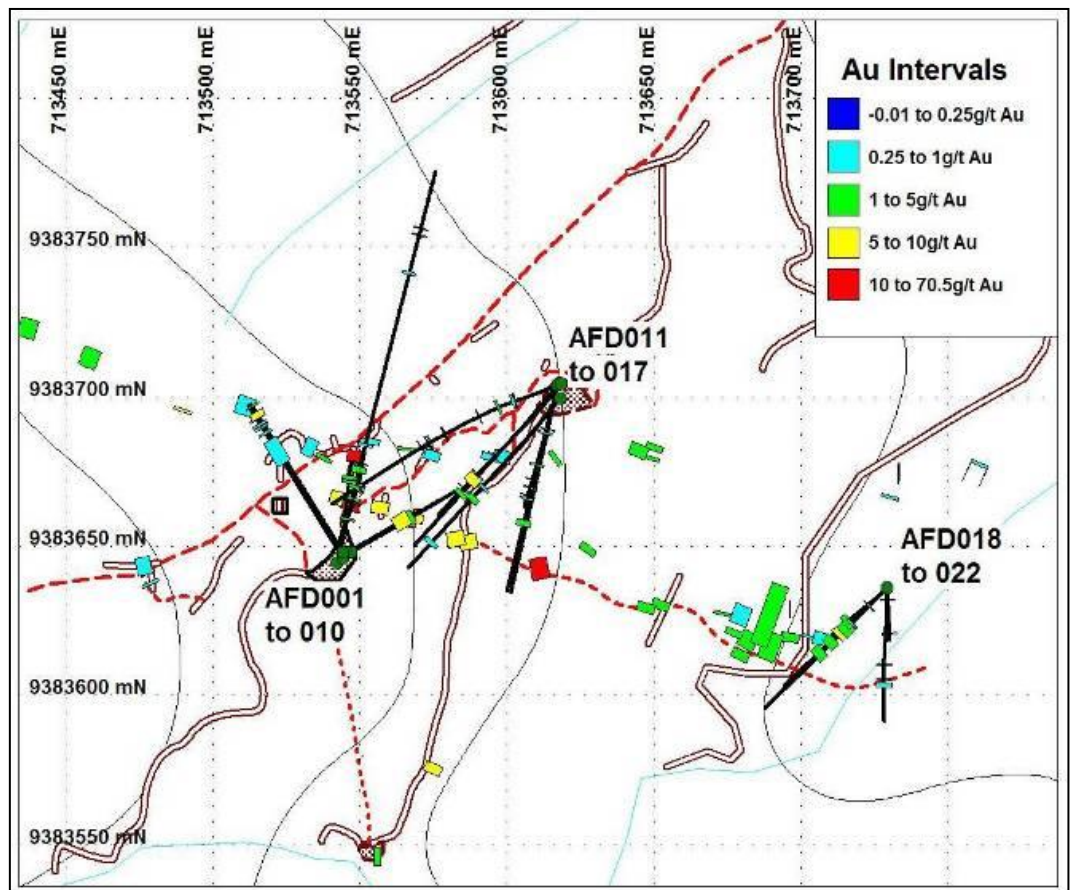
Hole Number	Intercept Length	Weighted Assay Grades		
		Gold (g/t)	Silver (g/t)	Zinc (%)
AFD001	1.2 m	4.06	-	-
AFD002	0.2 m	5.43	95.0	11.10
AFD003	2.5 m	1.43	16.4	0.25
AFD004	6.9 m	1.60	4.6	0.12
incl.	0.7 m	6.28	3.0	0.39
AFD005	4.5 m	5.69	1.4	2.34
incl.	1.0 m	18.45	-	10.30
AFD006	2.9 m	6.39	6.2	-
incl.	0.9 m	10.55	-	-
AFD007	5.9 m	13.07	6.0	0.14
incl.	2.0 m	15.25	-	-
AFD016	1.0 m	6.41	1.5	-
AFD017	10.8 m	6.99	12.4	0.17
AFD018	17.9 m	2.09	0.7	-
AFD019	18.6 m	1.13	0.7	-
AFD020	3.5 m	6.51	1.5	-
incl.	0.9 m	15.10	1.7	-

## GEOLOGY

Mt Andewa crater lies in westernmost New Britain and forms part of a chain of Holocene, generally calc-alkaline volcanoes (Bismarck Volcanic Arc), that extend from Rabaul in the east to Manam Island in the west. They represent the recent expression of volcanism above the northward subducting Solomon Sea microplate south of New Britain and the obliquely subducting Australian plate to the west of New Britain. Many of the volcanoes of the Bismarck Arc are still active, including Mt Gloucester 50km west of Mt Andewa, but those at Mt Schrader and Mt Andewa may be 650 000 years old and are regarded as extinct.

Mt Andewa has been mapped as a Pleistocene to Holocene volcano (the Andewa Volcanic Complex of Ryburn (1976)) overlying a series of Pliocene volcanoclastic sediments (Aria beds) to the south. These rocks appear to interdigitate southwards with the Pliocene marine calcareous siltstone units of the Johanna beds, which overly unconformably a basement series of Eocene to Pliocene age. These basement rocks consist of the Miocene-Pliocene to Miocene Yalam Limestone and the unconformably underlying Eocene to Oligocene calc-alkaline volcanics and interbedded sedimentary rocks of the Baining Volcanics.

Further east, the Baining Volcanics are overlain unconformably by the Late Oligocene Merai Volcanics, composed of moderately indurated lapilli tuff, andesitic breccia, conglomerate and minor limestone. Dioritic and microdioritic dykes and stocks intrude the Baining Volcanics. Other basement units include Early to Middle Miocene sedimentary rocks cropping out east of the EL and include the Pali



River Conglomerate and the Bergberg Formation (calcareous sandstones and mudstones).

No major faults were recognised in the Mt Andewa region by Ryburn (1976), although aerial photos show possible fault-controlled lineaments in the general area around EL 1345. The early work of the mining companies since 1976 included reconnaissance mapping in the Mt Andewa-Schrader region (Wroe, 1987; Wroe, 1988a, b; Harris *et al.*, 1988, 1989; Harris 1989; Harris and Morrissey, 1990; Harris, 1991, 1992) and confirmed Ryburn's assessment of the dominant rock-types in these two volcanoes.

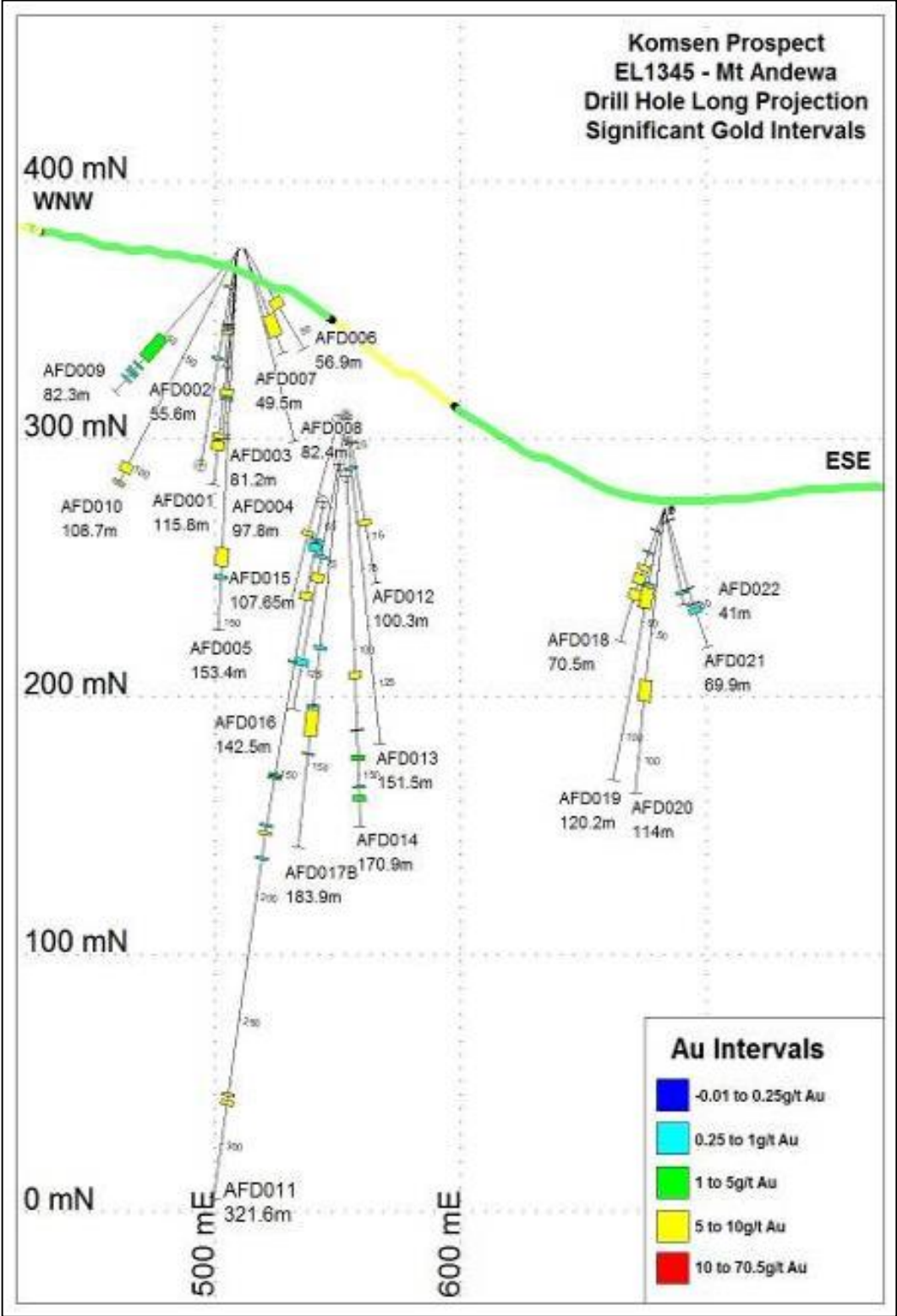
Mt Andewa is a heavily dissected, slightly asymmetric volcanic cone ranging in altitude between 200m in the crater floor to around 1300m at the top of Mt Crater on the northern side of the crater rim which is about 9km across. The relief is steep and in places deeply incised and the rivers draining the crater are still cutting down, as evidenced by perched fluvial deposits on the sides of gorges cut into the bedrock (Findlay, 2006). This may indicate recent or continuing uplift.

In some past reports, the Mt Andewa volcano has been referred to as a caldera, implying an explosive collapse. Although interpretation of LANDSAT imagery and reconnaissance mapping in the Mt Schrader volcano has led to the suggestion that this volcano may indeed be a caldera, there is no known evidence for explosive collapse at Mt Andewa; this has been assumed but not proved in some early reports.



The Mt. Andewa volcano crater rim has been breached on its northwest side by the Komsen River. Although the crater rim is composed of basalt, the strongly eroded core contains lithology of a more variable range in composition and texture, e.g. lavas, tuffs and pyroclastic rocks of andesitic, basaltic and dacitic composition. Intrusive units have also been mapped in creek exposure and logged in core. They include a suite of mafic intrusive rocks dominated by microdiorite, pyroxene rich and lesser hornblende diorites, and felsic rocks which include dacites, feldspar porphyries and diorites. A unit of intrusive breccia occur in structural intersections.

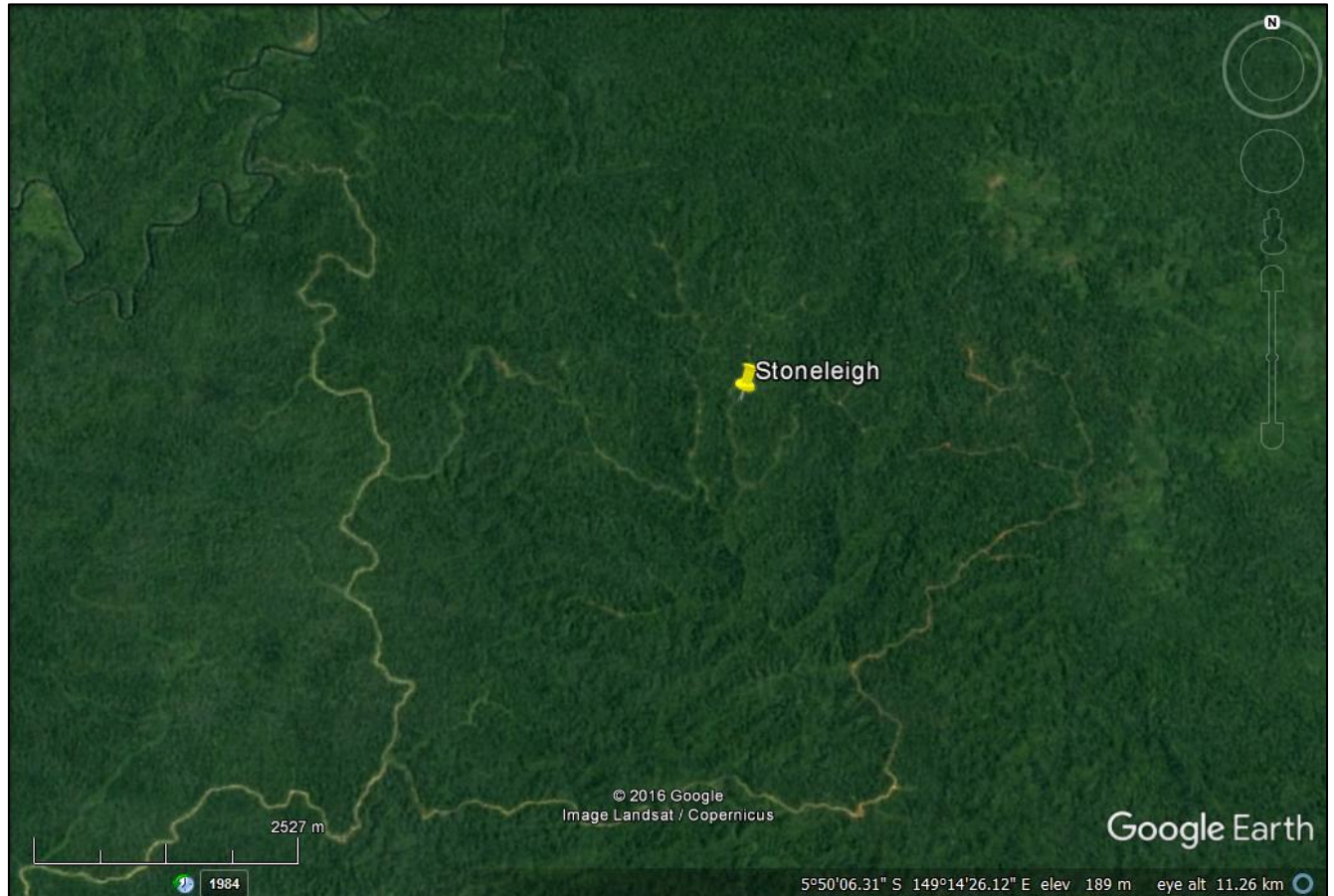
The most common rock type within the prospect area in creek exposures and in drill core are andesites, dacites and basalts. Differentiation of basalts and andesites is generally based on grain size with andesites being medium grained to coarse grained rocks whereas basalts are generally fine grained with occasional coarse grained porphyritic basaltic rocks with big feldspar phenos in very fine basaltic ground mass. Occasional fragments of other rock types are embedded in the groundmass of these rocks. They are believed to have been caught up on the way to the surface. Both the andesites and basalts are pyroxene rich with main mineral being hypersphene – augite with lesser hornblendes. The groundmass of some of these rocks consists of feldspar and quartz. The dacitic rocks are generally grey green in colour and outcrop mostly in lower elevations at creek level and occur both as pyroclastics and perhaps also as intrusives.



## STONELEIGH PROSPECT

The Stoneleigh prospect occurs within an interpreted 5.6 km diameter circular rim identified from SRTM topography.

There has been effectively no exploration work conducted over this prospect which is associated with a ~50 km<sup>2</sup> window of weakly molybdenum mineralised volcanics at the NW end of the major crustal Lamogai Structure at the juncture of a NNE trending structure. A recent major earthquake on the Lamogai Structure occurred at 70km depth, demonstrating the 'plumbing' system is well developed to enable the potential formation of significant mineral deposits.



CRA completed regional reconnaissance stream sampling in the area in the 1960s. BHP completed rock sampling at the Aria River prospect and their extremely limited work 21 years ago showed copper >0.1% in two different rock types (0.1% was the analysis method maximum reading and the actual value was not later determined by a method capable of reading a higher limit), along with effectively all the samples collected being anomalous in molybdenum and arsenic with trace gold.



The limestones that overlie the volcanics are quartz veined and arsenic and molybdenum anomalous, demonstrating close proximity to a mineralising system.

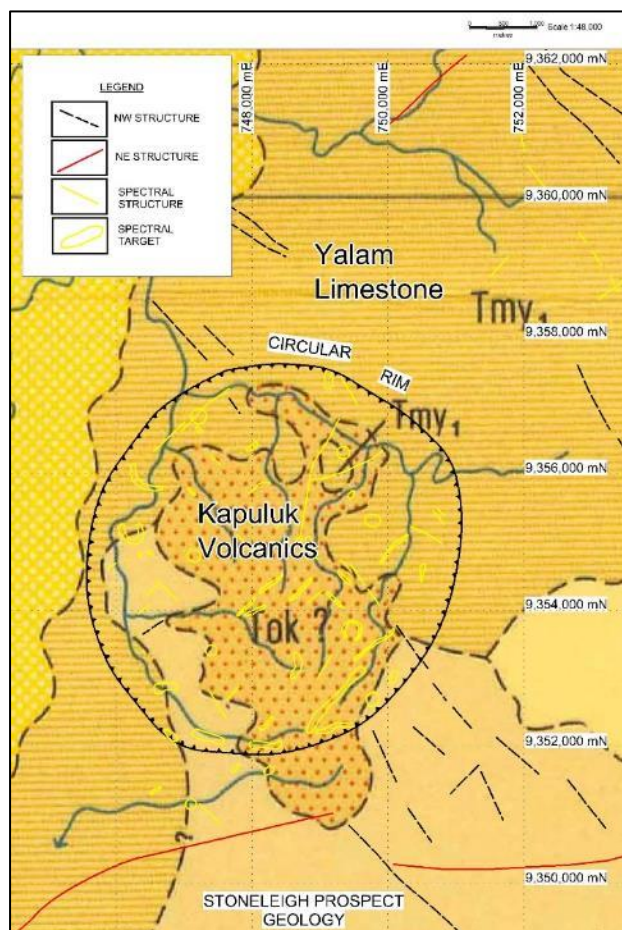


The average of the 36 reconnaissance samples was 165 ppm arsenic + 25 ppm molybdenum + 0.02 g/t gold + 96 ppm copper. This shows the area is significantly molybdenum and arsenic anomalous, being proximal to porphyry copper or porphyry gold mineralising systems. Anomalous stream sediment samples (> 100 ppm arsenic) occur within the interpreted circular rim of the Stoneleigh prospect and eight stream panned concentrate samples reported visible gold.

Mineralised rock types sampled included:

- Basalt, (or tuff, unaltered).
- Tuffaceous andesite.
- Epithermal quartz vein.
- strongly silicified and acid leached rock, with minor pyrite.
- Strong silicification, disrupted chalcedonic quartz, ~1% strong haematite.
- Altered microdiorite.
- Volcanic breccia and tuff.

Additional conceptual targets occur in the tenement within the lightly explored volcanics and under limestone cover rocks at other major structural intersections. Limestone at Stoneleigh contains molybdenum and strong arsenic associated with quartz veining demonstrating that the limestones were in contact with mineralising fluids



Au	Mo	As	Cu	Sample	Lithologic Description
0.05	50	160	>1000	GWE06RF8	<b>Basalt</b> , if not tuff. Unaltered. 2-5% quartz veining with 1% pyrite and strong 2-5% magnetite, possibly 1-2% chalcopryite. The chalcopryite mineralisation is likely associated with the quartz veining; quartz veining also introduced the magnetite.
0.02	10	340	>1000	GWE11RF8	<b>Tuffaceous andesite</b> . Phenocryst replacement of the plagioclase to clay; 4:1 mafic/felsic ratio. 1%pyrite restricted to veins, strong limonite coating in fracture, minor quartz veins. Open spaced quartz - chalcedony veins.
0.06	18	230	27	GWE06RF12	<b>Silicified acid leached rock</b> . Strong silicification, acid leaching, disrupted patches of chalcedonic quartz. 1-2% pyrite, strong haematite (speckle and earthy), goethite, limonite. Original texture completely obliterated, cavities infilled by fine
0.04	18	60	17	GWE08RF6	<b>Epithermal quartz vein</b> . Silica replacement of carbonate, epithermal textures: lattice & cockscomb texture, vuggy quartz. 1-2% pyrite, possibly compact pyrite. Petrology analysis shows the rock to be part of a pyritic epithermal quartz/chalcedonic silic
0.15	15	210	92	GWE06RF5	<b>Intermediate intrusive</b> . Possibly phlogopite alteration overprinted by quartz>>sericite>>pyrite, vugs infill by quartz and euhedral pyrite. 1-2% pyrite, No magnetite, no other sulphides.
0.01	36	<50	146	GWE06RF10	<b>Intermediate intrusive (microdiorite)</b> . Weak chlorite/epidote alteration, 1% quartz micro veinlets. 1-2% disseminated pyrite, no magnetite. Quite strong surficial limonite.
<0.005	84	150	9	GWE11RF5	<b>Limestone</b> . Chalcedony silica veinlets. Vuggy.
0.01	16	70	17	GWE06RF11	<b>Biomicritic limestone</b> . (petrology: fossiliferous marine limestone). Vein controlled chalcedonic quartz replacement. No visible sulphides. Petrological analysis showed the rock to be silicified fossiliferous (bryozoal foraminiferal) marine limestone
0.02	59	420	19	GWE06RF13	<b>Altered microdiorite</b> . Strong Sericite>>pyrite>>quartz. Strong Silicification.>2%pyrite fracture coating and disseminated limonite >> goethite. No magnetite. Strongly fractured
0.02	52	270	38	GWE06RF9	<b>Altered pyroclastic</b> . Possible sericite>>quartz>>pyrite, strong surficial limonite coating. Pyrite is the only sulphide. Both clasts and matrix undergo clay pyrite alteration.
0.01	18	220	94	GWE04RF1	<b>Volcanic breccia</b> . Weakly chloritised, carb-epidote-chlorite veining, surficial limonite coating. >2%disseminated pyrite, << 1% magnetite, no other sulphides. Possibly propylitically altered rock, clast of glass, quartz and lithic fragments in chl
0.01	16	170	61	GWE03RF2	<b>Volcanic breccia</b> . Strong pervasive chlorite/epidote alteration, both in matrix and clast. 1-2% pyrite, possible >1% Matrix supported breccia, clasts strongly rotated, no magnetite.
0.01	23	130	58	GWE06RF1	<b>Volcanic breccia</b> . Strong porphyry alteration (epidote>>chlorite). Clasts comprised dominantly volcanolithic and lithic fragments and mineral grains in a strong propylitic altered matrix
0.02	64	170	31	GWE03RF3	<b>Altered tuff</b> . 50% rock displaying epidote with strong chlorite alteration, possible garnet. No sulphide visible. Clasts and phenocryst of the original rock totally replaced by epidote/Chlorite alteration. Original texture obliterated, likely syn-volcanic
0.01	14	130	36	GWE04RF2	<b>Volcanic tuff</b> . Massive epidote garnet. Quartz vein possibly replacement alteration. 1% pyrite surficial limonite coating, strong magnetite. Epidote-garnet. Quartz vein propagate fractures.
0.02	14	310	14	GWE11RF7	<b>Andesitic</b> Fragmentation. Quartz/sericite pervasive. 4% disseminated pyrite.
0.01	11	140	6	GWE03RF4	Weak chlorite alteration in the groundmass, phenocryst unaltered. 3-5% magnetite, trace dissemination pyrite. No other sulphides. Huge euhedral phenocryst of feldspar, in a chloritised groundmass, Possible <b>andesite if not a high level of porphyry</b> .
0.01	13	150	33	GWE04RF3	<b>Intermediate intrusive</b> . Strong pervasive chlorite >> epidote alteration, possible rare phlogopite, if not fine hematite. 5% pyrite, strong surficial limonite, no magnetite, no other sulphides. Possibly high level intrusive.
0.01	9	180	23	GWE03RF1	Epidote, strong goethite & limonite in fractures and phenocryst and clastic replacement. >5% pyrite disseminated and fracture coating. Possible <b>intermediate intrusive or dactic volcanic or high porphyry</b> . Brown staining appear to be alteration biotite



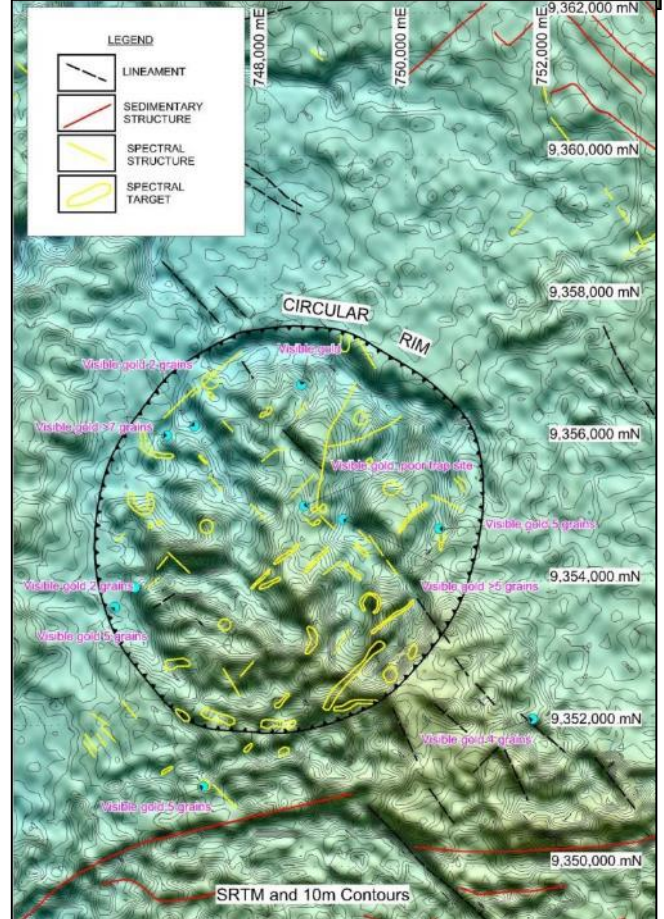
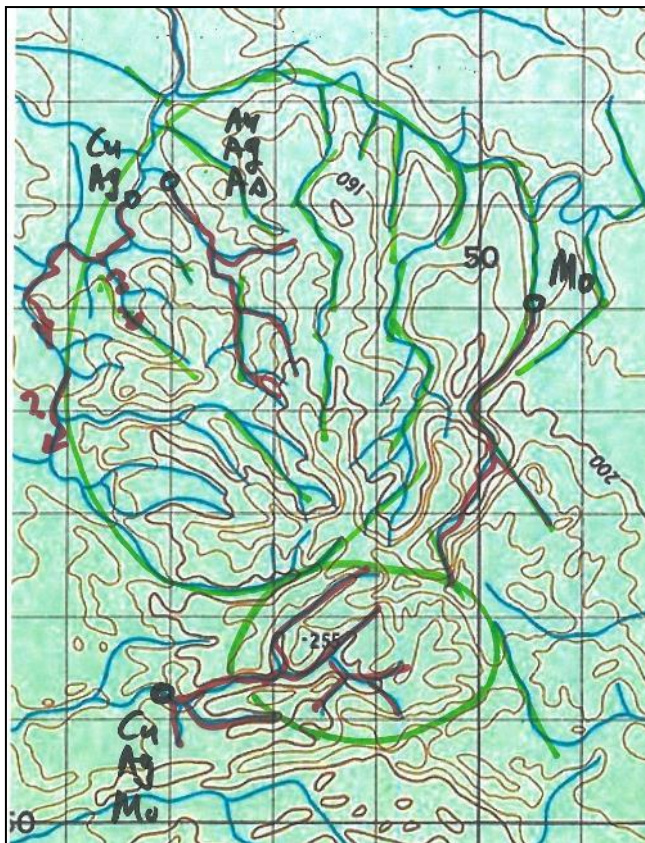
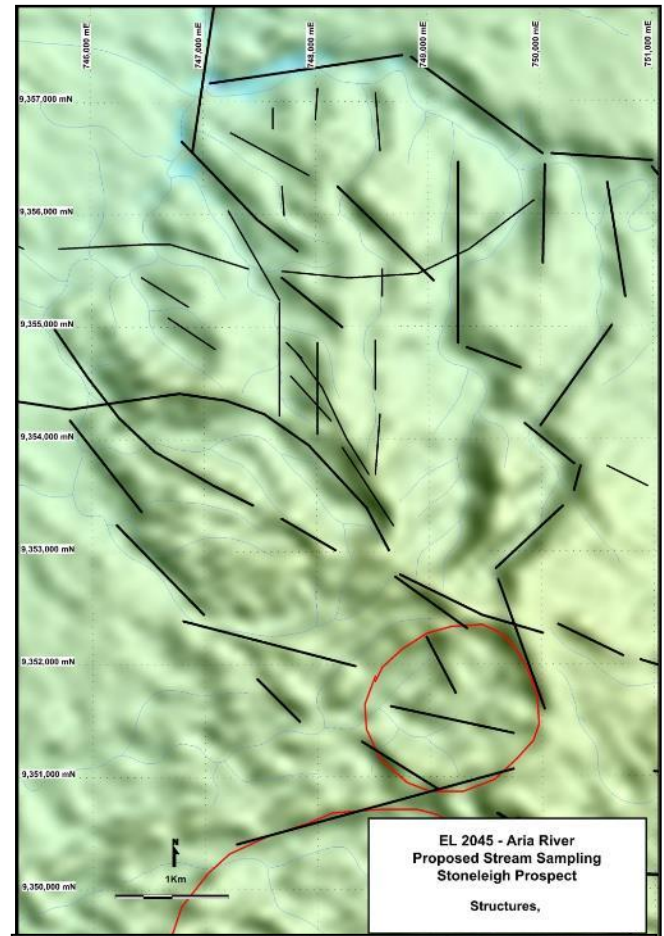
Aster satellite imagery was acquired over the tenement and Image enhancements were created to help discriminate between clay types as a result of possible alteration.

Interpretation of the Aster image enhancements outlined areas of potential mineralisation related to alteration, structure and silica. A total of 41 target areas were selected within or near the interpreted 5.6km diameter circular topographic rim, collectively called the Stoneleigh prospect and nearby to panned gold in historical creek sample.

Enhancements also utilised higher resolution band of 15m pixel size and the lower resolution 90m pixel size bands to show quartz or silica. The SRTM topography and higher resolution (15m pixel size) infra-red images were used to interpret structures. These interpreted targets help locate areas of possible alteration and mineralisation. Interpreted zones of silicification and linear silicified structures have been identified from the quartz and silica ratio images. These target areas of silicification require follow-up stream and rock chip/float sampling.

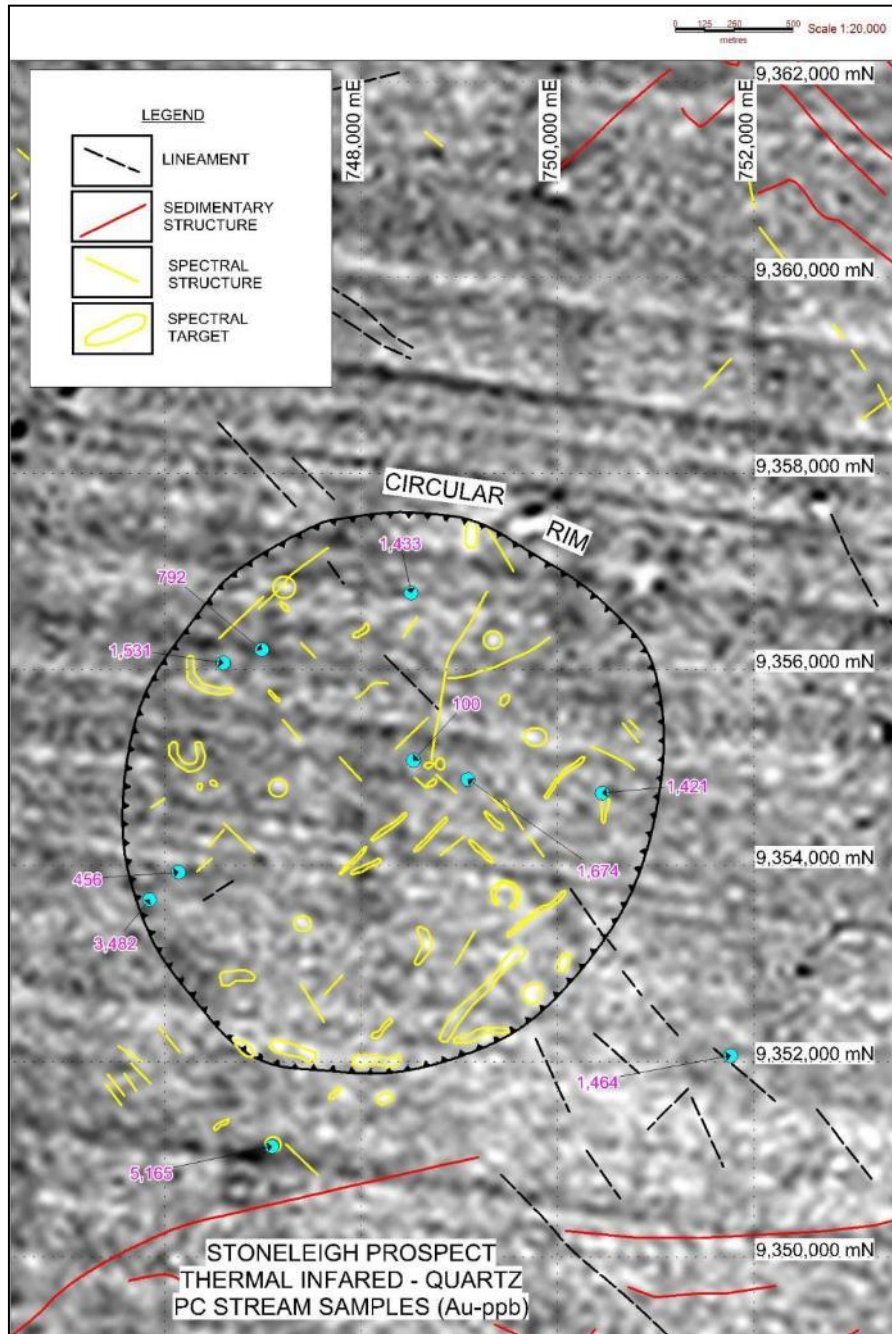
A total of 41 separate target areas (S1 to S41) have been interpreted from Aster images as zones of silicification or alteration. Linear features have also been identified and may represent zones of epithermal activity along structures.

Visible gold was panned in eight sites within the circular rim of the Stoneleigh prospect and target areas have been interpreted from the Aster imagery with a view that they may be potential sources of alteration and mineralisation.

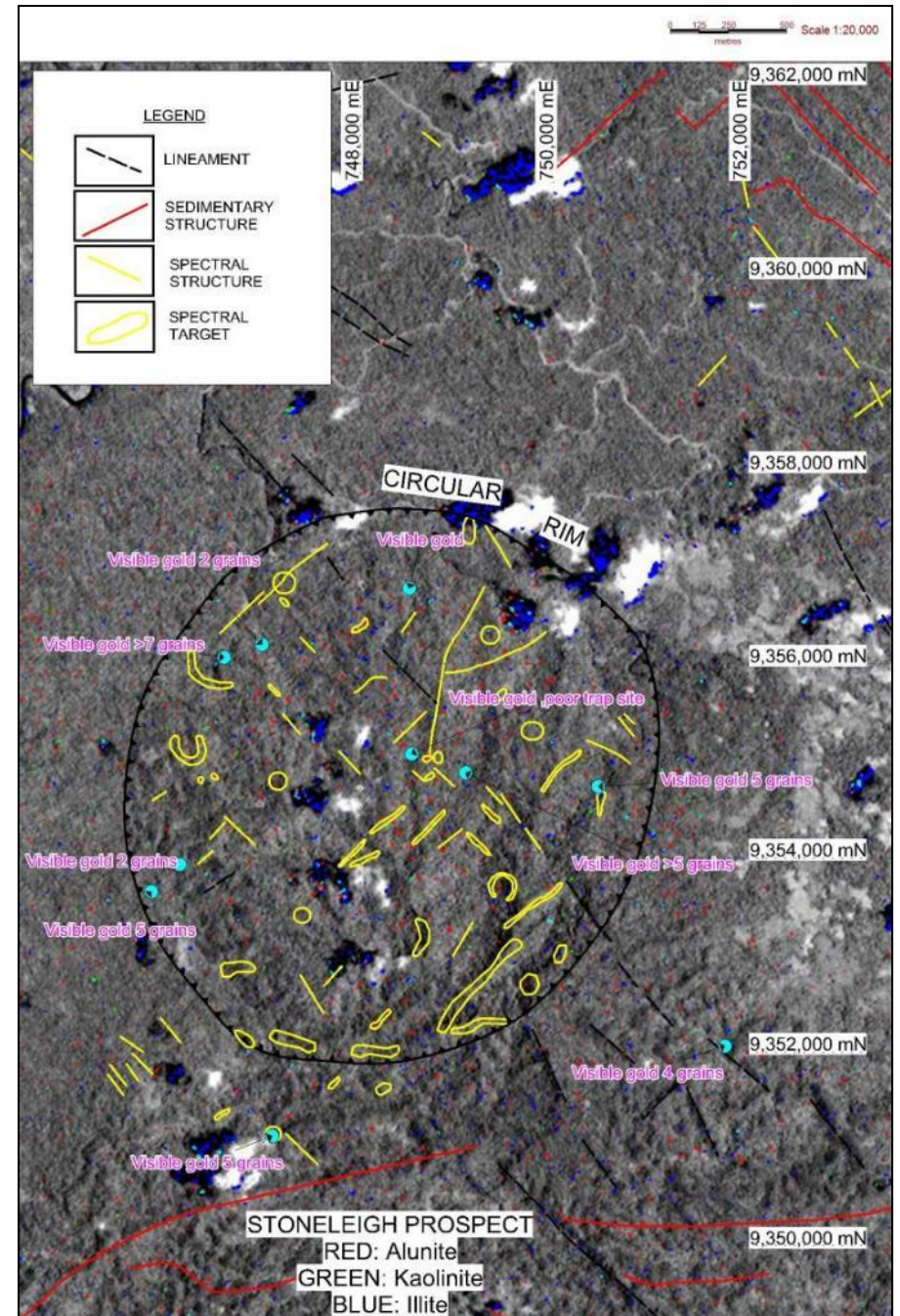




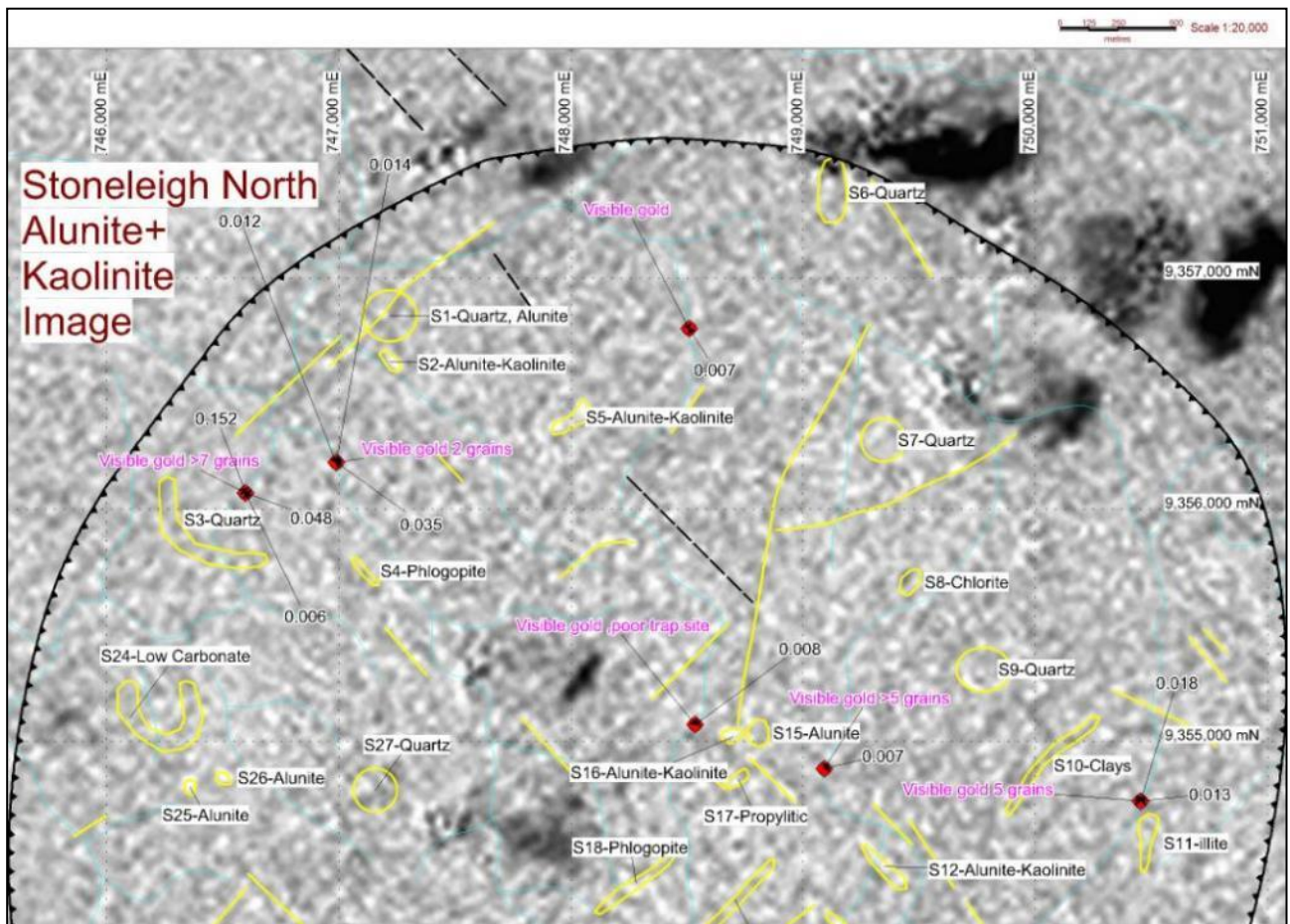
TIR quartz ratio image over the Stoneleigh prospect



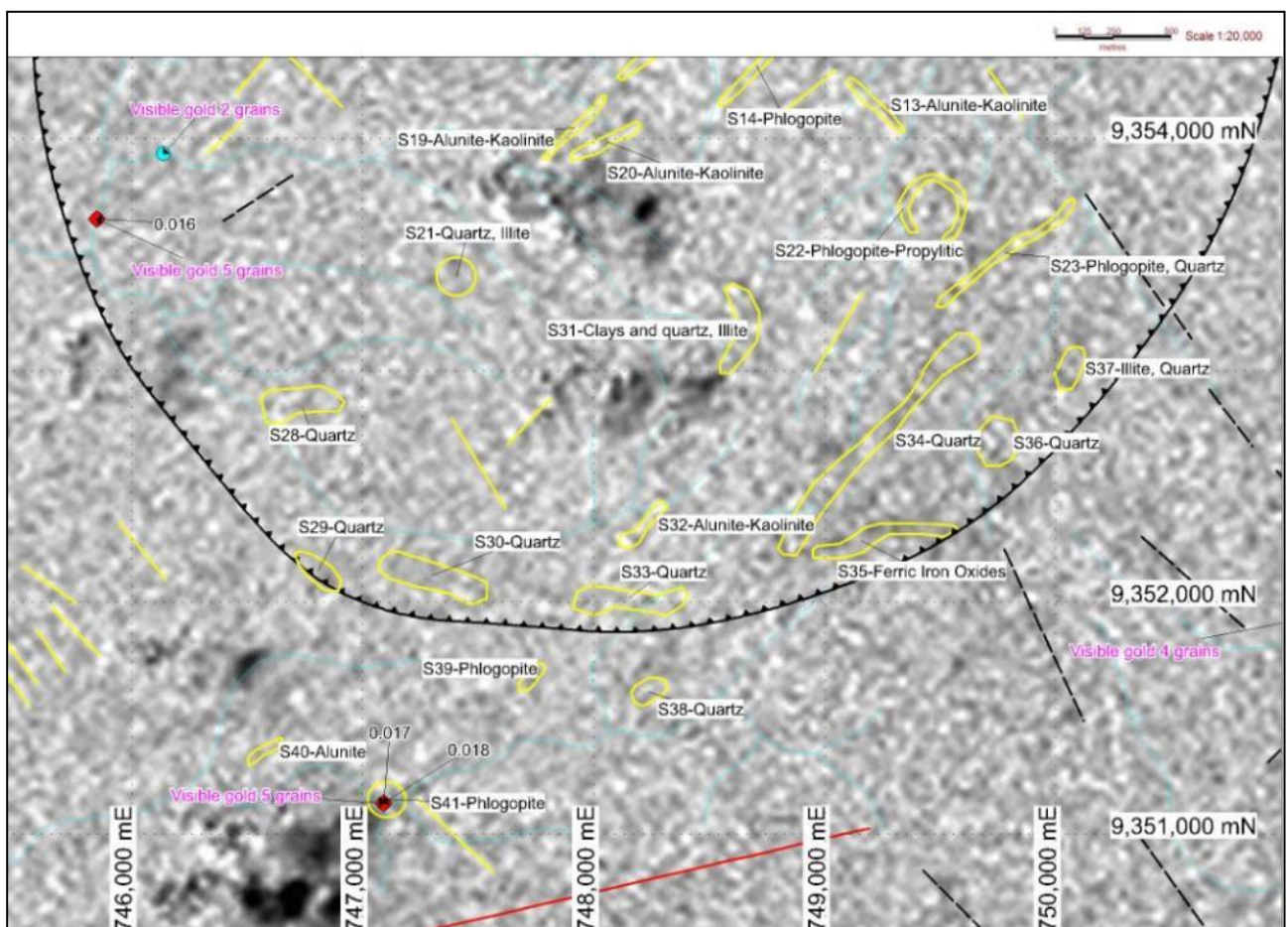
SWIR image over the Stoneleigh prospect







Alunite/kaolinite greyscale image over the northern half of the Stoneleigh prospect

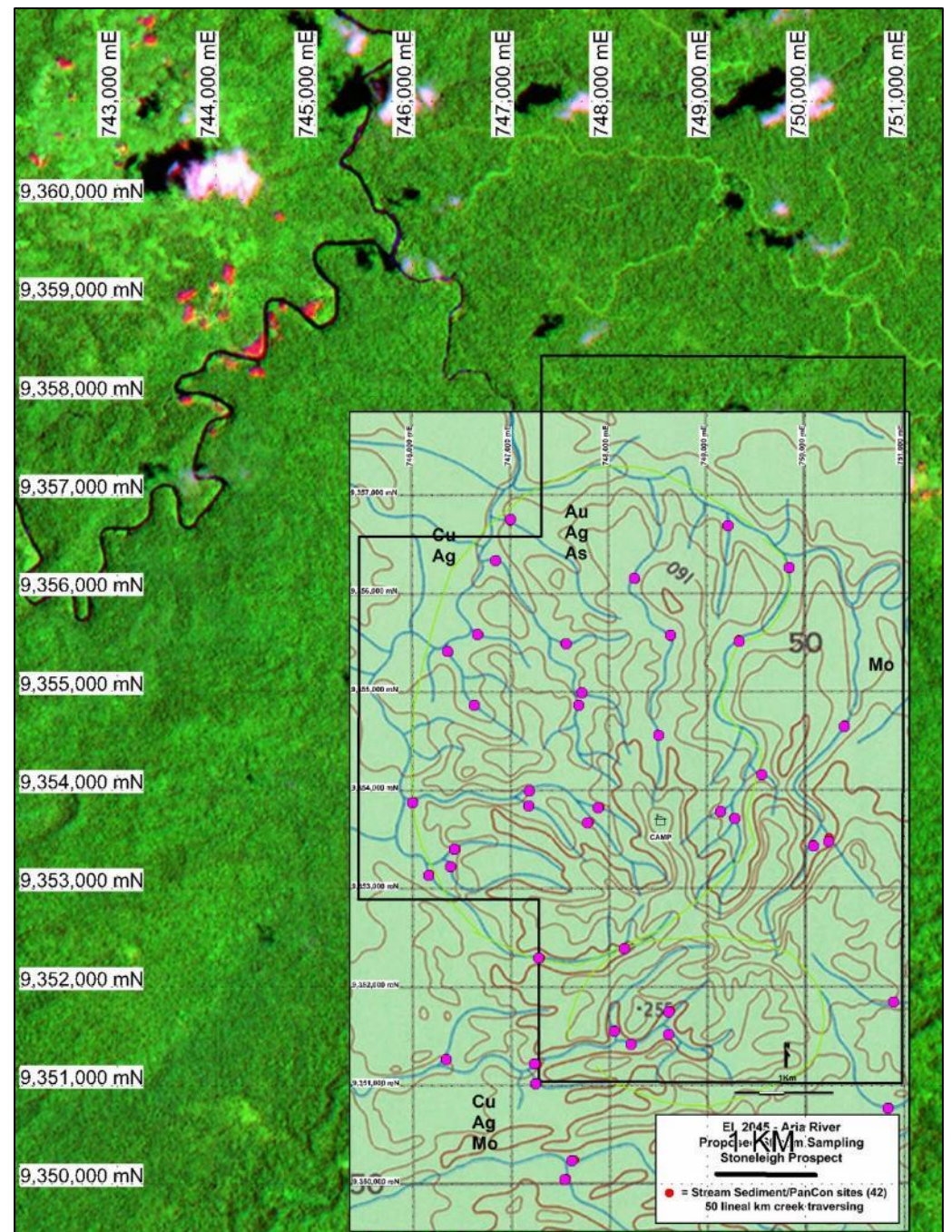
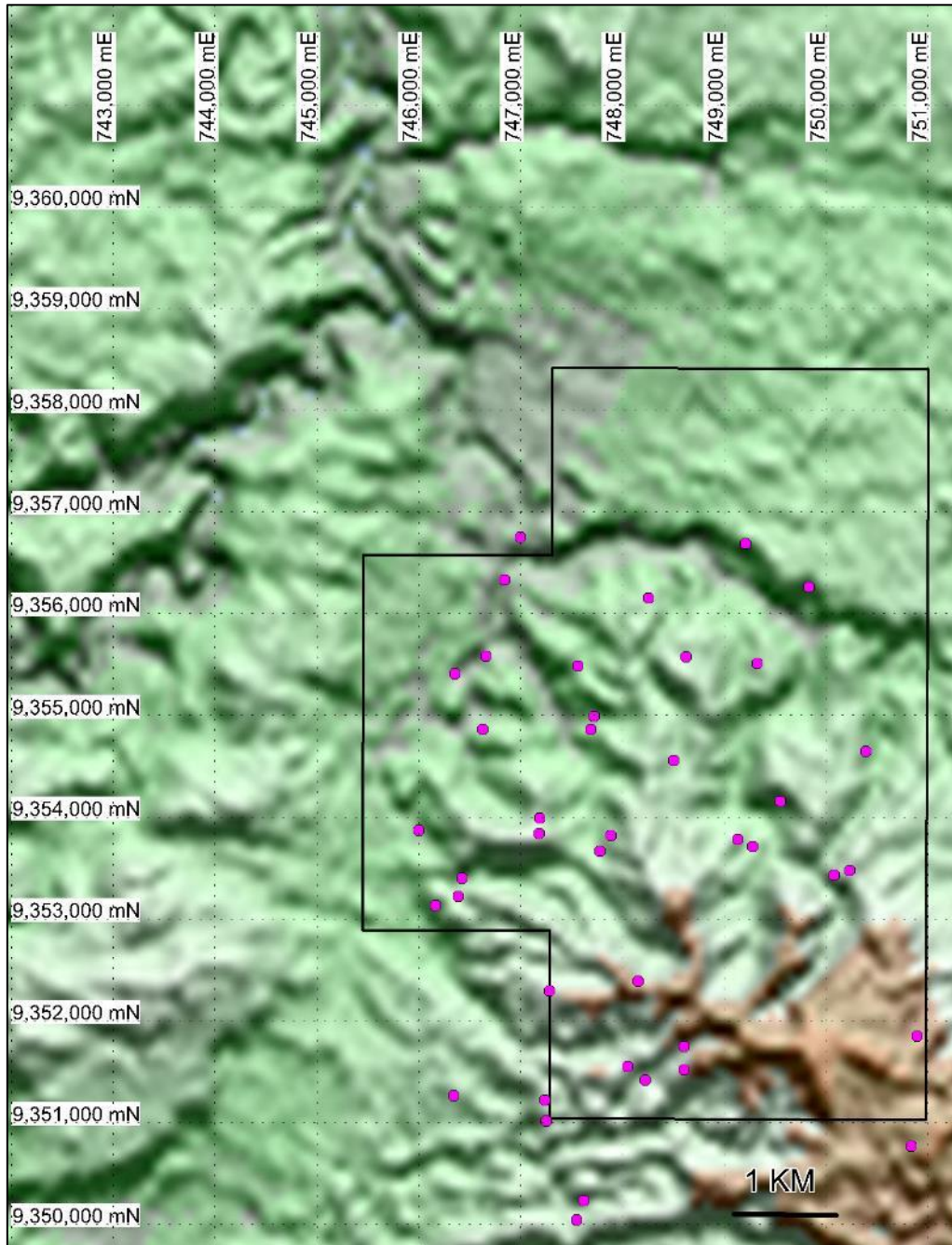


Alunite/kaolinite greyscale image over the southern half of the Stoneleigh prospect

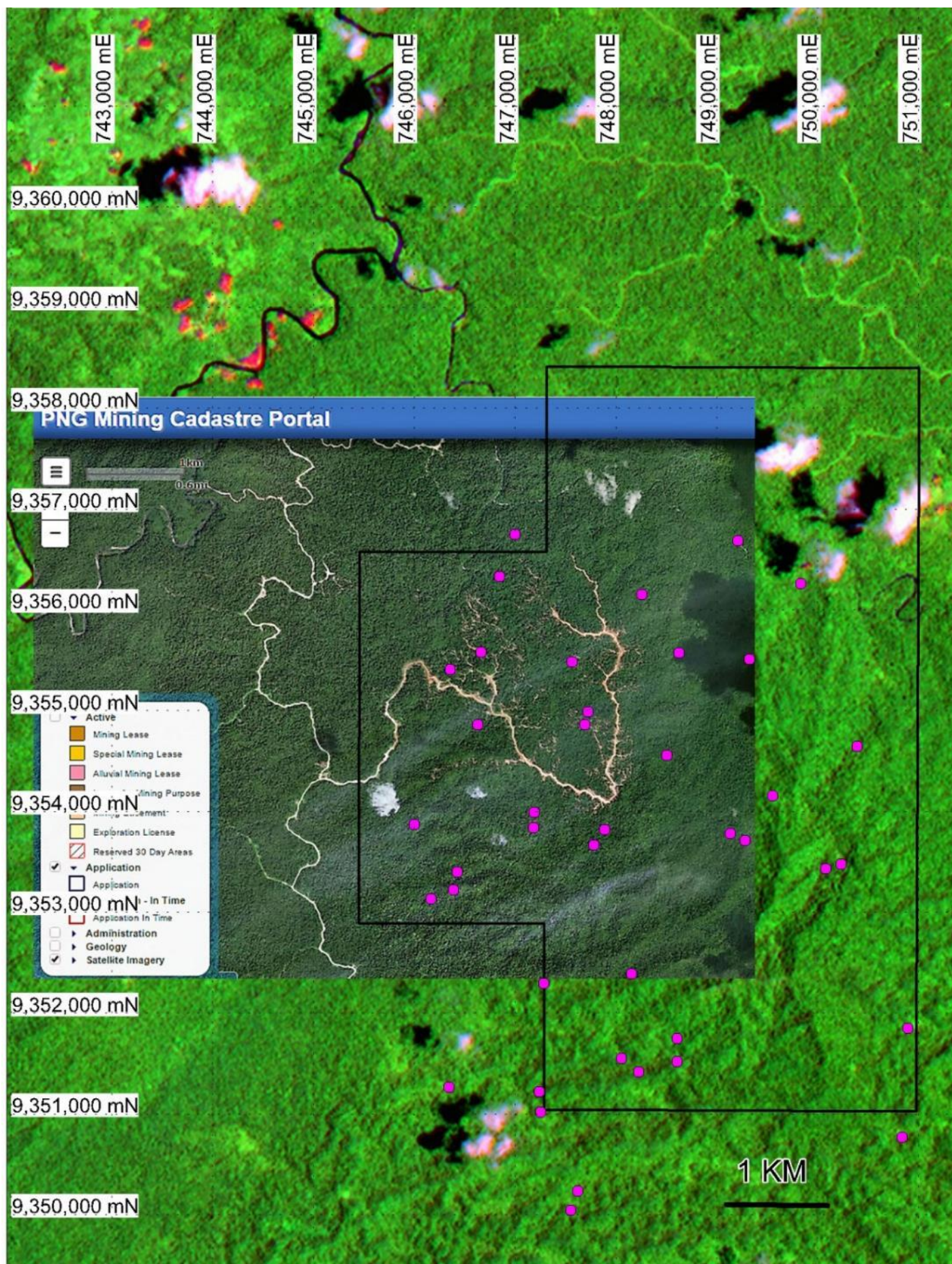


No.	Location (AGD066, Zone 55)	Stoneleigh Prospect Area Aster targets Description
S1	747220e, 9356840n	Circular anomaly in the TIR quartz image on a linear NE trending structure.
S2	747220e, 9356640n	Anomalous in alunite, kaolinite and illite, 80m in length trending northwest along the edge of a creek.
S3	746500e, 9355790n	Circular anomaly in the TIR quartz band 600m in length and cutting across a creek upstream from reported visible gold in pan con samples.
S4	747080e, 9355760n	Anomalous in possibly phlogopite in a 150m long northwest trending anomaly 140m from a creek.
S5	748040e, 9356420n	Anomalous in alunite and kaolinite over 150m in length.
S6	749110e, 9357360n	Oval shaped anomaly in the TIR quartz band ratio and 200m in length.
S7	749340e, 9356300n	Circular 100m diameter anomaly in the TIR quartz band ratio.
S8	749470e, 9355690n	Small chlorite-illite anomaly.
S9	749770e, 9355320n	Circular anomaly in the TIR silica ratio band.
S10	749990e, 9354870n	A 500m elongated area anomalous clays indicating possible alteration.
S11	750490e, 9354630n	North-south trending target anomalous in illite and next to a creek where 5 grains of visible gold were panned.
S12	749320e, 9354480n	Elongated alunite-kaolinite anomaly trending northwest, 200m in length and lying across a creek.
S13	749170e, 9354190n	A 300m in length, elongated alunite-kaolinite anomaly which continues across a creek.
S14	748620e, 9354210n	Linear northeast trending structure anomalous in the phlogopite and propylitic alteration ratios.
S15	748800e, 9355040n	A 70m diameter circular alunite anomaly.
S16	748690e, 9355020n	A small 50m diameter circular alunite-kaolinite anomaly.
S17	748730e, 9354840n	A northeast trending anomaly in the propylitic ratio.
S18	748210e, 9354340n	Linear 400m long northeast trending structure anomalous in phlogopite and propylitic alteration ratio at the headwater of a creek.
S19	747940e, 9354060n	Linear 350m long northeast trending structure anomalous in alunite-kaolinite at the headwaters of a creek.
S20	748080e, 9354000n	Linear 300m long northeast trending structure anomalous in alunite-kaolinite at the headwaters of a creek, 70m south of anomaly S19.
S21	747420e, 9353400n	Minor circular target anomalous in the quartz ratio.
S22	749580e, 9353750n	A 200m diameter annulus of phlogopite also anomalous in the propylitic ratio, next to a creek.
S23	749860e, 9353570n	Linear 700m long zone of propylitic alteration trending northeast.
S24	746220e, 9355010n	Low carbonate halo 370m in diameter cutting across a creek.
S25	746350e, 9354800n	Small discrete alunite anomaly.
S26	746500e, 9354840n	Small discrete alunite anomaly.
S27	747150e, 9354800n	Discrete circular anomaly in the TIR quartz ratio.
S28	746630e, 9352830n	Two discrete anomalies in the TIR silica ratio occurring between creeks.
S29	746820e, 9352130n	Discrete oval shaped TIR quartz ratio anomaly on the south-western section of the









The Stoneleigh Project is the SE section of 3 non-contiguous tenement blocks relating to the Option Agreement for FNT to earn a 90.1% interest in EL 2461, by exploration expenditure totalling \$100,000 (released to ASX 28/4/2017) (Option requires a 'fairness report' and shareholder approval).



## **OPTION AGREEMENT SIGNED TO PURCHASE FRONTRUNNER EXPLORATION PNG LTD ALA RIVER EL AND KOL MOUNTAINS ELA, WEST/EAST NEW BRITAIN PROVINCES, PNG**

Frontier Resources Limited (**Frontier**) is very pleased to announce it has signed an Option Agreement to purchase 100% of FrontRunner Exploration PNG Ltd on 15/12/2017, for the consideration of A\$80,000 (reimbursed expenses), plus a future 4.9% Net Smelter Royalty to the vendor's nominees, on all metal /saleable products produced, from each Mining Lease /mining operation within the boundaries of EL 2375 - Ala River and ELA 2513 - Kol Mountains (subject to Frontier shareholder approval).

### **No exploration was conducted at EL 2375 - Ala River between 1986 and 2012 and Exploration highlights are:**

- **Uasilau -YauYau is a copper in soil anomaly > 9,000m long by 700m to 2,000m wide.** Most of the grid was not analysed for gold.  
13 shallow (<90m) and 2 deep holes were drilled in the 1970's at a miniscule density of 1 hole/sq km.  
The Koka Prospect hole returned 304m of 0.12 % copper + 82 ppm molybdenum over its entire length and outcrop sampled creeks returned 395m averaging 0.15% copper.  
The Kaikai Prospect hole (located 2,100m to the east) returned 305m grading 0.10% copper + 21 ppm molybdenum over its entire length.
- The **Pelepuna Skarn** Prospect has continuous outcrops to 4m of 15.8% zinc and 5m of 128 g/t silver. Seven short holes were drilled 34 years ago, with results to **16.7m grading 6.88% zinc**.
- **The Pelepuna copper-gold porphyry deposit potential remains untested by drilling.**
- **Uasilau North has a gold in soil anomaly > 2,000m long and 700m wide** with excellent access and hand trench results to 12m grading 1.25 g/t gold and 35m of 0.80 g/t gold.
- **Gavuvu Prospect has 10m of 150 g/t silver** in very limited trenching completed, with extensive low tenor gold, copper, lead, zinc and arsenic in soils.
- **Ala River Prospect has 8m of 2.41% copper + 0.11 g/t gold** in a trench and up to 4.34% copper in float.

Chairman and Managing Director, Peter McNeil commented:

*FrontRunner Exploration PNG Ltd is minority owned by myself (49%) and 2 Papua New Guinean consultants/ shareholders to Frontier Resources with 51%. FrontRunner owns Ala River- EL 2375 and has also applied for Kol Mtns - ELA 2513, on New Britain Island.*

*Ala River is an excellent porphyry copper-gold, epithermal gold and polymetallic skarn region that has not been explored on the ground for 31 years. The Pelepuna porphyry has never been drilled, while its surrounding skarns returned up to 16.7m grading 6.88% zinc in very limited drilling.*

*Frontier has negotiated an Option to purchase a 100% interest in FrontRunner for a 4.9% Net Smelter Royalty on possible future production, plus a cash payment of A\$80,000, for all compiled data and the bond on EL 2375.*

*It is much easier and cost effective to explore in New Britain relative to the Highlands of PNG and access in the Ala EL area is excellent for possible future mine developments. The Kol Mountains ELA had a successful Warden's Court Hearing in early-March 2017 and should go before the Mining Advisory Council (MAC) in July to consider granting the EL. A comprehensive report will be posted to the website post haste and information will be released on the Kol Mtns ELA forthwith.*

### **EL 2375 - ALA RIVER SUMMARY**

Exploration Licence 2375 was granted to FrontRunner Exploration PNG Ltd on December 14<sup>th</sup> 2015; it is located about 90km east to southeast of Kimbe straddling the boundary of West and East New Britain Provinces. No ground exploration has been completed for 31 years.

The region is highly prospective and contains two known porphyry copper mineralised zones, zinc - gold skarns, gold in quartz sulphide veins and epithermal gold – silver. Known prospects include, Uasilau/ YauYau, Pelepuna skarns, Pelepuna porphyry copper, Uasilau North, Gavuvu and Ala River Skarn.

A multi-phase intrusive complex of Miocene age intruded older volcanics and limestone of the Baining and Kapaluk Volcanics. There is widespread surficial tephra cover. The intrusives were emplaced in three pulses over a 6.6Ma period during the Miocene (30Ma to 23.5Ma). Alteration and mineralisation is associated with the youngest phase. Intrusive



types include granodiorite, quartz diorite, gabbro and quartz feldspar porphyry, with associated andesitic and rhyolitic volcanics.

### Uasilau -YauYau

The Uasilau mineralisation was discovered in 1965 by CRAE during the Craestar survey. Results of up to 3400ppm copper (one assay of 1.2% copper was reported) and 4360ppm zinc in stream sediment samples were reported.

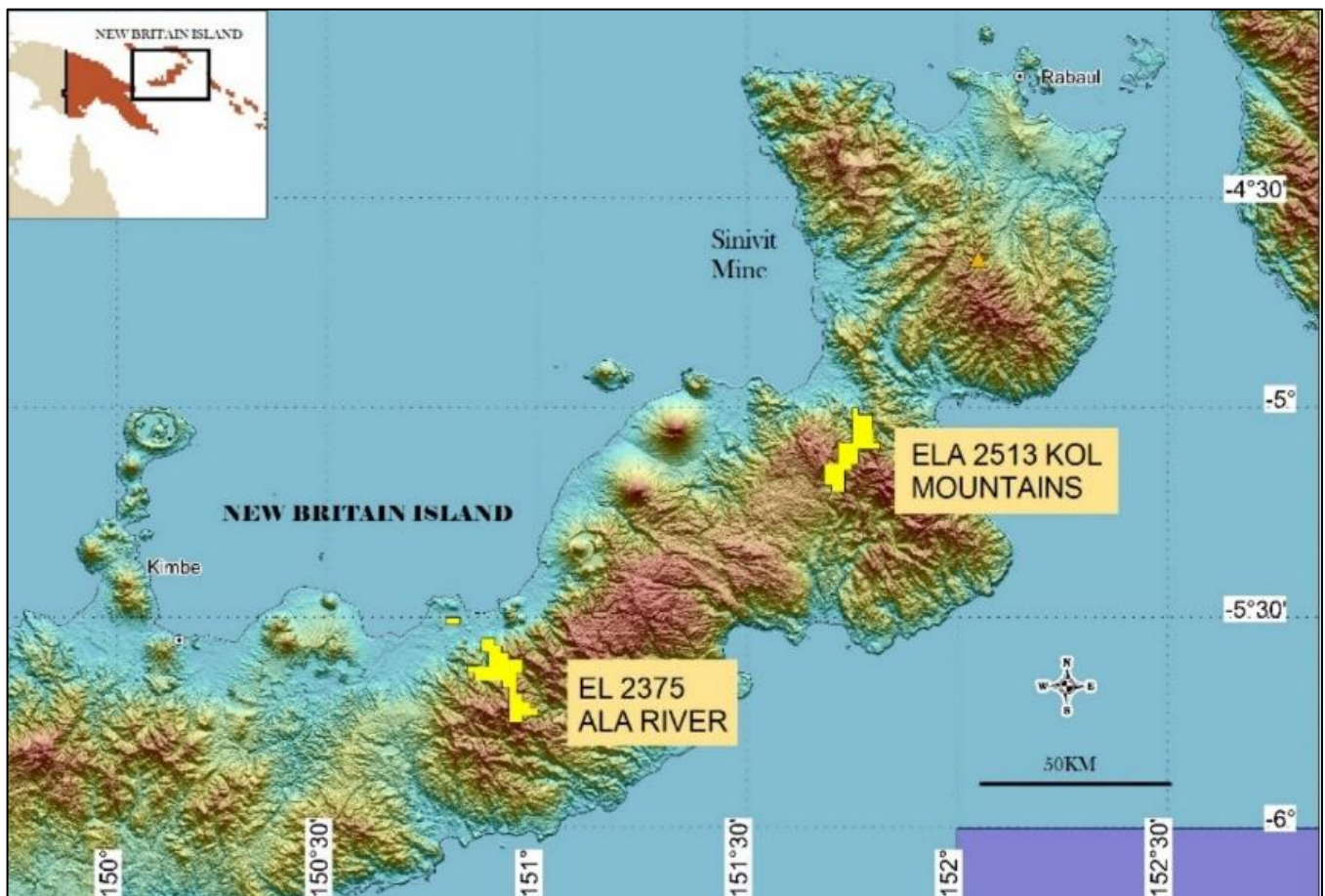
Rock and ridge / spur soil geochemistry by CRAE defined an erratic anomalous area with dimensions of about 9km x 1.2km trending NW, within which there are several zones containing 0.1-0.2% copper in soils over areas of up to 90,000 sq m. The latter areas were grid soil sampled, hand trenched and pitted.

Bedrock sampling highlights included a 360m x 550m area of plus 0.1% copper and ~500m grading 0.15% copper in Bilele Creek. The highest bedrock copper values correlate with zones of more intense shearing and brecciation. Follow up grid soils, pitting and drilling was carried out by CRAE. Subsequent work was undertaken by Placer, CEC-MIMETS, Triako-Buka, Esso PNG and Frontier/OTML.

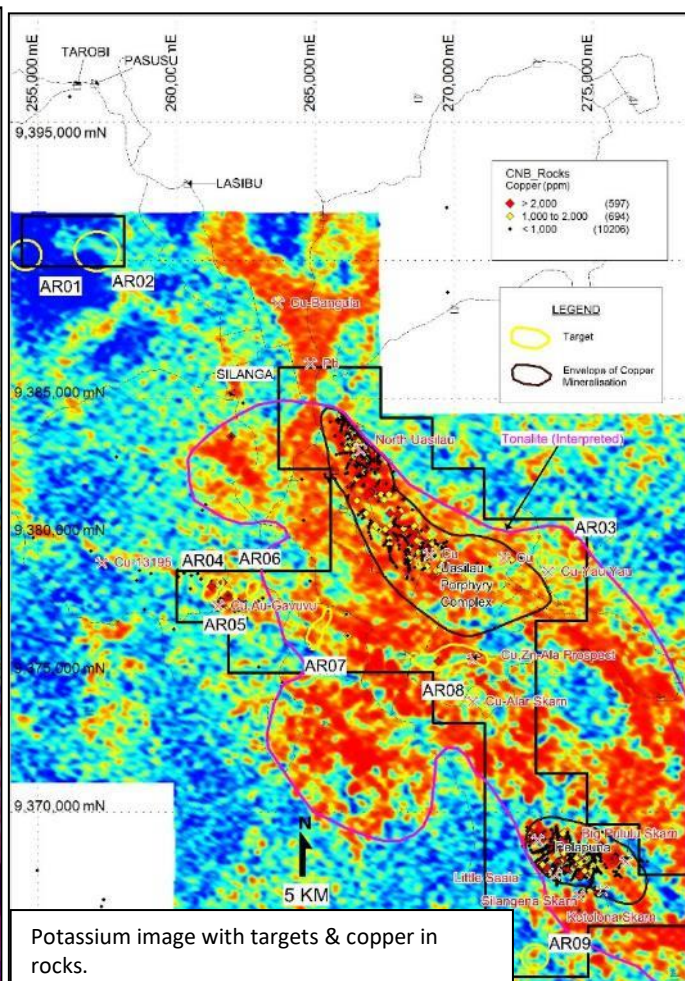
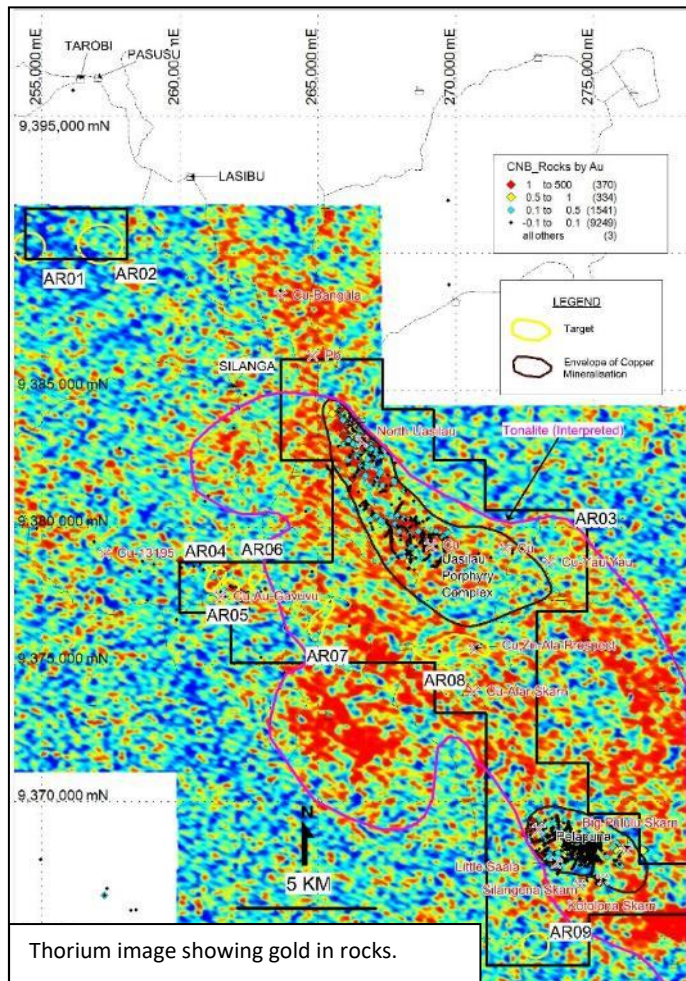
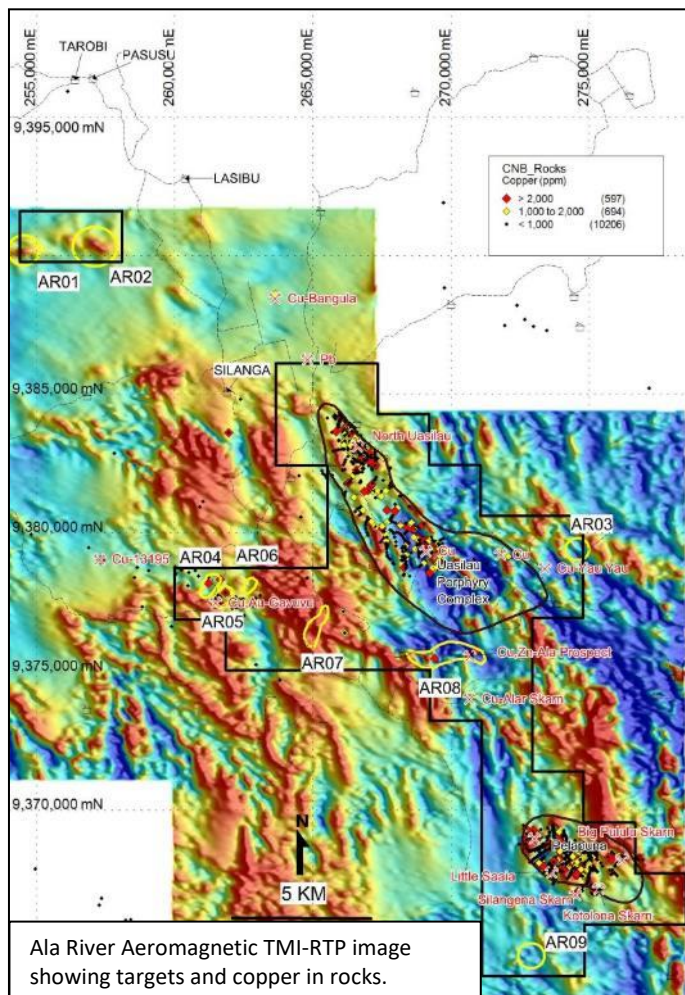
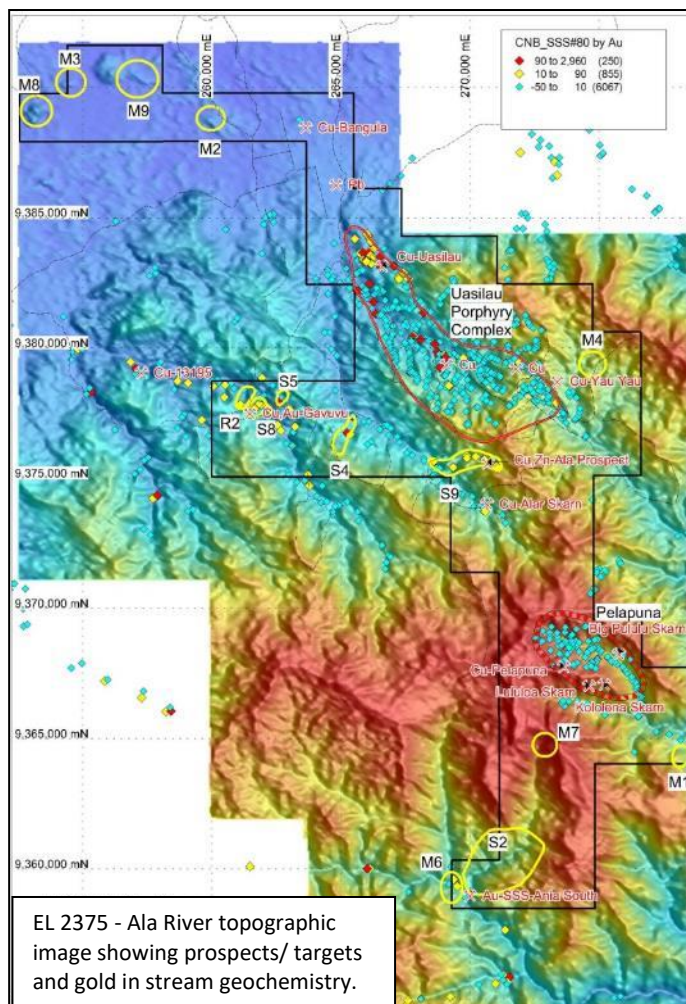
15 historical holes were drilled by CRAE, Placer and CEC.

CRAE: 2 diamond holes (304m & 305m), 2.5km apart based on soil/pit geochem to test Koka and Kaikai anomalies with copper mostly 0.1-0.2% on surface. Best intersection was 300m grading 0.12% copper, including 3m grading 0.47g/t copper, with low gold, molybdenum and silver. The Kaikai hole appears to have intersected 305m of a possible diatreme breccia.

Placer: 3 diamond holes (37m, 90m and 99m) based on IP anomalies, copper values 0.02-0.1% and a high pyrite to chalcopyrite ratio. CEC: 6 diamond holes (66-70m deep). The best hole averaged 0.24% copper, the others averaged in the range 0.07% to 0.18% copper, molybdenum <100ppm, low gold, 1-4% total sulphides and a pyrite: chalcopyrite ratio of 6:1.







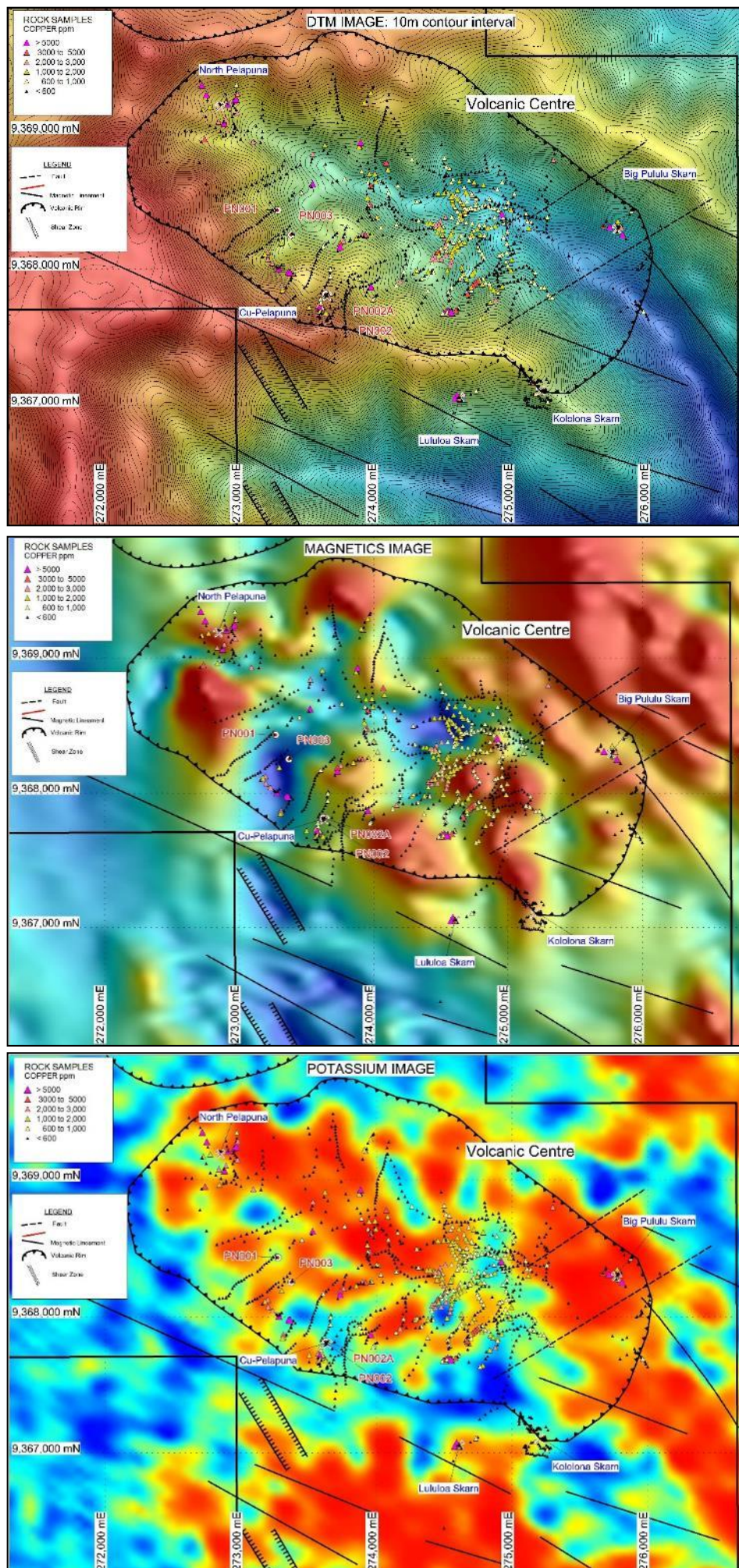


## Pelepuna and Ala River Prospects

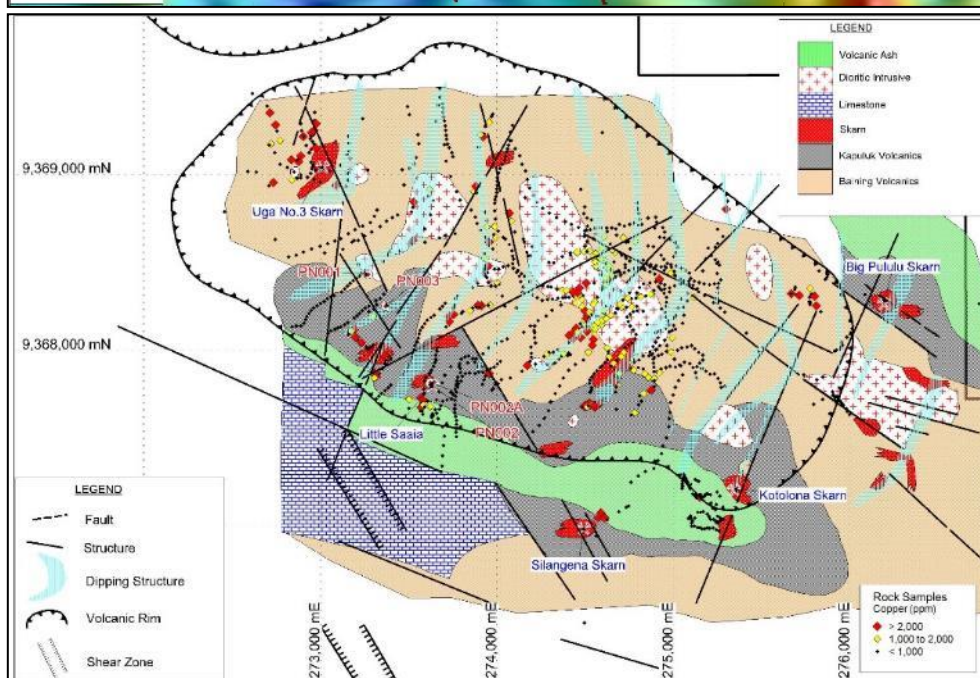
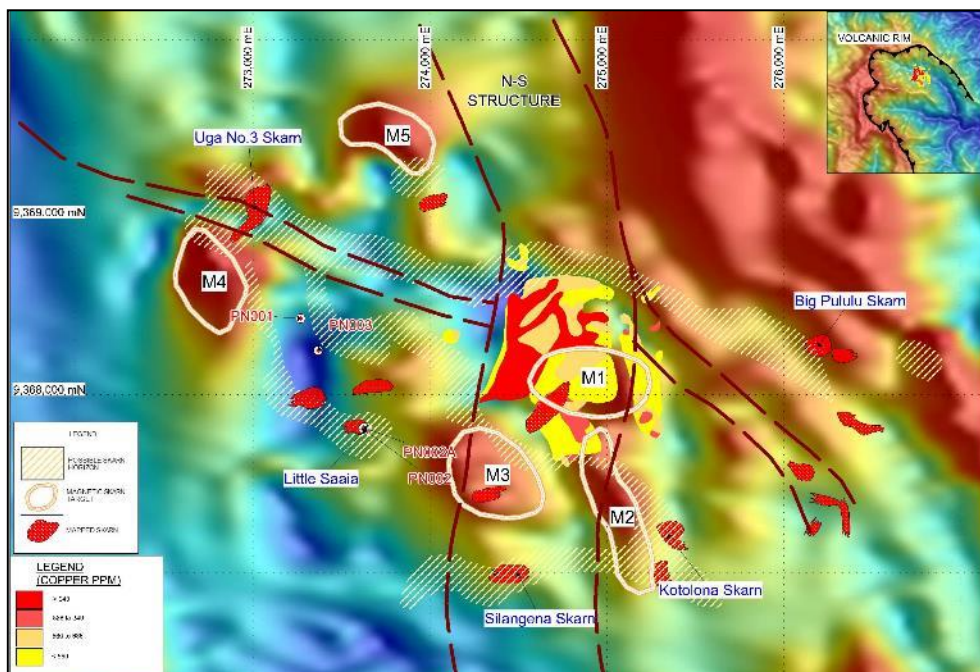
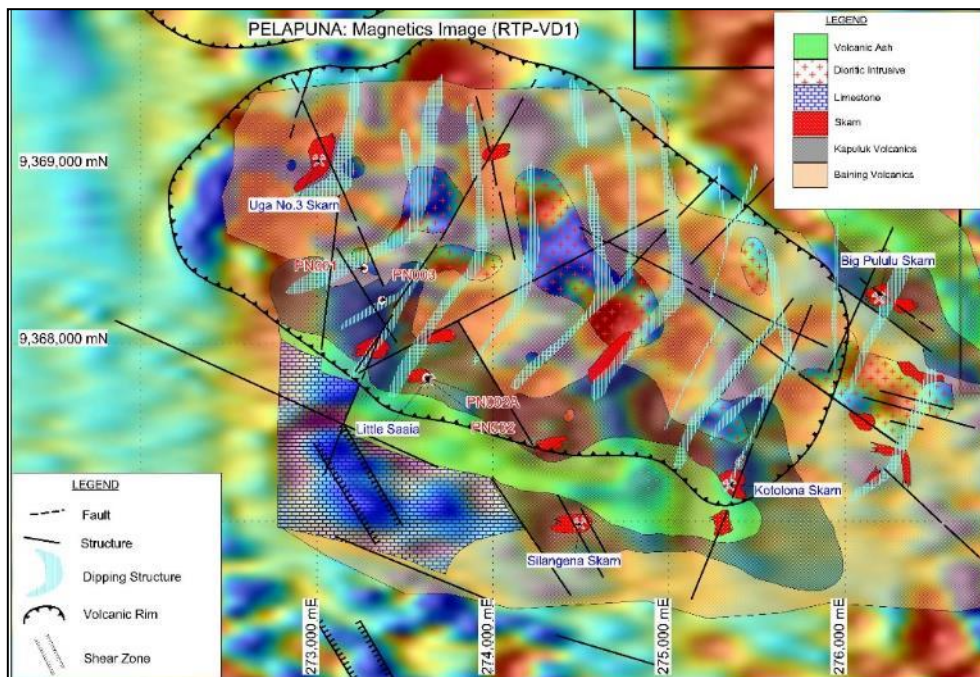
Pelepuna is located ~14km south of Uasilau. There are zinc-rich skarns at both Pelepuna and Ala River.

A variety of calc-silicate skarns are developed at Pelepuna related to dyke-like gabbro-diorite bodies intruding Kapaluk volcanics and limestone. Skarn assemblages include garnet, magnetite, epidote, chlorite, tremolite-actinolite, diopside, pyrite, sphalerite, galena and chalcopyrite.

Surface sampling and drilling shows the skarns are zinc-rich and copper-poor. Four diamond holes were drilled by Esso to test a fault-controlled skarn carrying sphalerite, galena and pyrite. The best intersection was 16.7m grading 6.88% zinc with low gold and copper.









## Uasilau North

The prospect contains a gold in soil anomaly > 2,000m long and 700m wide, with seven geochemically anomalous zones historically defined on the basis of gold anomalous soils, with three considered more prospective (A, B and G).

There is strongly fractured (180°, 150° and 040°, with 70° dips) to brecciated granodiorite float / outcrop with pervasive sericite –clay altered zones (to >10m wide) and quartz sulphide limonite veining was noted in Alelegwa Creek, with a pebble dyke occurring along it (indicating possible buried porphyry copper-gold mineralisation) plus various breccias.

Pyrite is ubiquitous, with rare chalcopyrite, chalcocite, covellite and bornite in quartz/pyrite veins/veinlets. Sphalerite was noted in float and outcrop in 2 locations. There is intense manganese in trenches 1, 2 and 25 through 30, indicating possible manto mineralisation. The latter trenches also contain weakly anomalous zinc associated with the manganese. There is low intensity disseminated epidote and/ or chlorite throughout the intrusive with slightly increasing intensity to the SE.

488 trench samples were collected from 31 general short trenches totalling 1,078m (at 1m, 2m and then 5m intervals). Higher grade gold, but rarely silver, occurred in isolated narrow quartz –pyrite veins /fracture zone. The peak trench grade = 5m of 5.38 g/t gold and grabs from veins in sericite altered zones in trench 17 returned 21.1 g/t gold + 19 g/t silver + 8 ppm molybdenum + 87 ppm arsenic and 4.03 g/t gold + 26 g/t silver + 13 ppm molybdenum + 370 ppm arsenic.

Hand trench assay result highlights included:

Trench 14 - 12m grading 1.25 g/t gold (area G)

Trench 3 - 26m of 0.50 g/t gold

Trench 29 - 35m of 0.80 g/t gold (peak = 5m of 5.38 g/t gold + 0.25% zinc + 1.42% manganese, at end of trench)

Trench 31 -25m grading 0.50 g/t gold (peak = 5m of 0.72 g/t gold + 0.15% copper + 4,800 ppm manganese + 18 ppm molybdenum + 40 ppm arsenic).

Trench 2 -1m of 4.58 g/t gold + 12 g/t silver + 0.10% copper + 650 ppm manganese

Semi-continuous generally quartz sulphide veined granodiorite outcrop rock chip sample assay highlights included:

- 5m of 6.70 g/t gold + 25 g/t silver + 17 ppm molybdenum + 210 ppm arsenic plus 141m of mineralisation containing 10m of 1.82 g/t gold + 0.18% copper, 10m of 0.94 g/t gold + 14 g/t silver + 0.16% copper + 0.18% zinc and 5m of 5.48 g/t gold + 15 g/t silver + 0.16% copper (+ 0.10% zinc + 70 ppm molybdenum).
- 13m of 1.60 g/t gold + 20.5 g/t silver (+ zinc, manganese and arsenic)
- 7m of 3.20 g/t gold + 17 g/t silver (+ 2,010 ppm manganese + 112 ppm arsenic)
- 0.6m of 10.7 g/t gold + 30 g/t silver + 0.16% copper (+ 1.96% manganese + 112ppm arsenic)
- 10m of 2.30 g/t gold

256 semi-continuous rock chip included 55 samples > 0.5 g/t gold, 75 samples from 0.1 to 0.5 g/t gold, 62 samples from 0.05 to 0.1 g/t gold and 64 samples < 0.05 g/t gold.

115 float rock samples were collected in 6 general locations/traverses, with 75 samples > 0.1 g/t gold. 18 samples were > 1.0 g/t gold and ranged from 1.13 to 15.0 g/t gold, with silver to 132 g/t (with 5.80 g/t gold). All samples had moderate to strong molybdenum. Copper ranged up to 0.17%, zinc to 0.26% and lead to 0.40%. Virtually all the floats had weak to moderate copper and sometimes higher silver associated with lower gold or with copper and zinc.

Float rock highlights included:

15.0 g/t gold + 21 g/t silver + 0.094% copper + 38 ppm molybdenum + 174 ppm arsenic

5.30 g/t gold + 32 g/t silver + 0.13% copper + 53 ppm molybdenum + 236 ppm arsenic

5.70 g/t gold + 47 g/t silver + 870 copper + 0.15% lead + 38 ppm molybdenum + 490 ppm arsenic

5.87 g/t gold + 132 g/t silver + 0.092% copper + 690 ppm lead + 128 ppm molybdenum + 1,320 ppm arsenic

5.68 g/t gold + 14 g/t silver + 720 ppm arsenic

0.37 g/t gold + 36 g/t silver + 0.41% lead + 33 ppm molybdenum + 327 ppm arsenic

2.01 gold + 18 g/t silver + 0.04% copper + 63 ppm molybdenum + 79 ppm arsenic

3.79 g/t gold + 24 g/t silver + 0.10% copper + 0.25% lead + 35 ppm molybdenum + 560 ppm arsenic

2.21 g/t gold + 4 g/t silver + 0.094% copper + 16 ppm molybdenum + 180 ppm arsenic

2.32 g/t gold + 4 g/t silver + 19 ppm molybdenum + 170 ppm arsenic

1.96 g/t gold + 35 g/t silver + <5 ppm molybdenum + 33 ppm arsenic

## REGIONAL GEOLOGY

A multi-phase, 15km by 6km intrusive complex has intruded older volcanics and limestone and there is widespread surficial tephra cover. The intrusives were emplaced in three pulses over a 6.6 million years ago (Ma) period during the Miocene (30 to 23.5 Ma). Alteration and mineralisation was associated with the youngest phase of intrusion. The geological plan, illustrates the intrusives, volcanics and sediments.

## PREVIOUS EXPLORATION

The Ala River EL was originally granted to Frontier Resources in 2010 and the Kol Mountains ELA was the third EL granted to Frontier in PNG in 2004. Both areas were Joint Ventured to Ok Tedi Mining Ltd from 2010 until 2013. Ok Tedi withdrew after spending about ~A\$12 million in exploration of the combined \$24 million earn-in requirement. Subsequently Frontier did not reapply for the EL's and allowed them to lapse.

FrontRunner Exploration PNG applied for Ala River in early-2015 and it was granted 14 December 2015.

No exploration was conducted between 1986 and 2012.

The property comprises at least four main prospects defined historically as multiple 2 mineralised porphyries, 1 cluster of skarns and epithermal to quartz sulphide vein mineralisation.

The tenement has a 9km long porphyry copper-gold-molybdenum occurrence at Uasilau/ YauYau, a zinc- gold skarn + porphyry copper-gold-molybdenum occurrence at Pelepuna, a zinc- gold skarn prospect at Ala River (+ a possible buried porphyry copper-gold deposit), an aeromagnetic porphyry signature and an intrusive/epithermal silver-gold occurrence at Gavuvu.

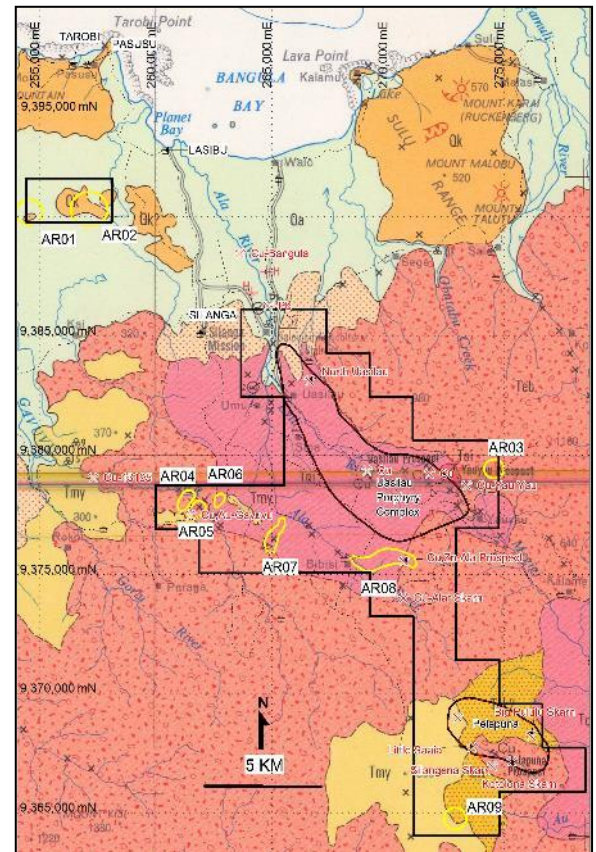
The Uasilau /YauYau porphyry copper molybdenum Prospect was discovered in 1965 and has been cursorily tested for porphyry and skarn-related copper mineralisation, with mapping, rock / soil geochemistry, airborne / ground geophysics and drilling of about 15 holes. Known primary porphyry-style copper grades are sub-economic (in the range 0.1-0.2% copper), with low gold and silver, but often moderate levels of molybdenum. Rock and soil geochemistry suggests there has been surficial enrichment of copper.

The rock and ridge/spur soil geochemistry defined a NW trending anomalous area more than 9,000m long and between 700m and 2,000m wide, with 5 areas about 1 sq km each, with > 500ppm copper, plus 4 smaller areas > 500ppm copper.

Bedrock sampling highlights included a 360m x 550m area with > 0.1% copper and about 500m grading 0.15% copper correlating with zones of more intense shearing and brecciation. The copper anomalism is strongest at the south end (YauYau) and is not closed off. The gold, conversely is strongest at the north end, but that is also an artefact of how much gold sampling was conducted at the time.

Drilling of mostly short holes included 304m grading 0.12% copper (including 3m of 0.47g/t copper) + 82 ppm molybdenum, with low gold, and silver. One hole appears to have intersected 300m of a possible diatreme breccia (the Golpu /Wafi Deposits are associated with a mineralised diatreme). The drill density is approximately 1 hole per 1.5 sq km of anomalous area.

Intrusives include quartz diorite, granodiorite, gabbro and quartz feldspar porphyry, with associated andesitic and rhyolitic volcanics. There is a large area of advanced argillic alteration representing possible unevaluated epithermal gold mineralisation. Gold analyses are limited, but indicate significant anomalous areas in soils and rock chips that warrant follow up.





Zinc-rich skarns are present at Pelepuna and Ala River Prospects. Pelepuna has a variety of calc-silicate skarns related to dyke-like gabbro-diorite bodies. Surface sampling and drilling shows the skarns are zinc-rich and copper-poor. Seven diamond holes tested a fault-controlled skarn with sphalerite, galena and pyrite and returned 16.75m grading 6.88% zinc + 0.14% copper + 0.15 g/t gold + 4 g/t silver, from 6.5m.

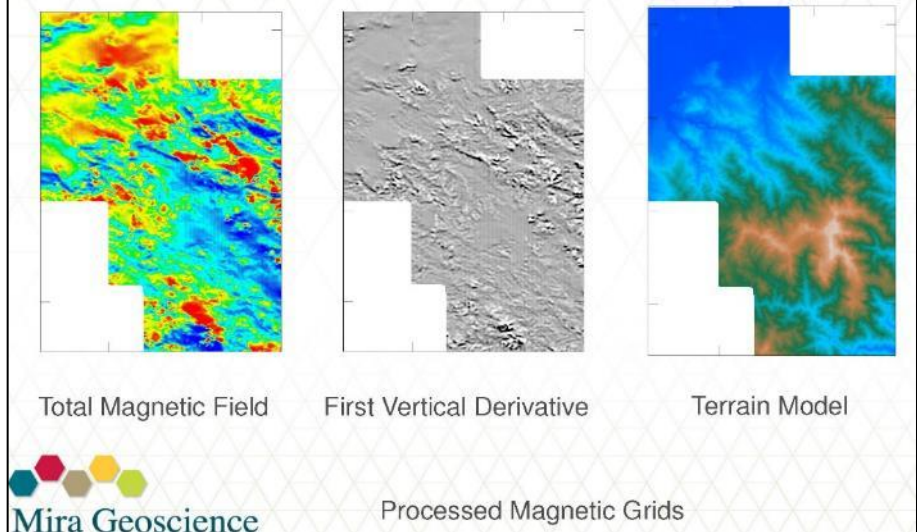
The Ala River Prospect noted 8m of 2.41% copper + 0.11 g/t gold in a trench and up to 4.34% copper in float.

The Gavuvu area has low + higher order silver anomalies in several drainages. The silver mineralisation occurs in silicification and quartz sericite alteration. Limited trenching has demonstrated to 10m of 150 g/t silver (incl **5m of 252 g/t silver**). A grab sample of a semi massive sulphide pod graded 0.90 g/t gold + 112 g/t silver + 47.5 % zinc + 6.1 % copper + 132 ppm molybdenum.

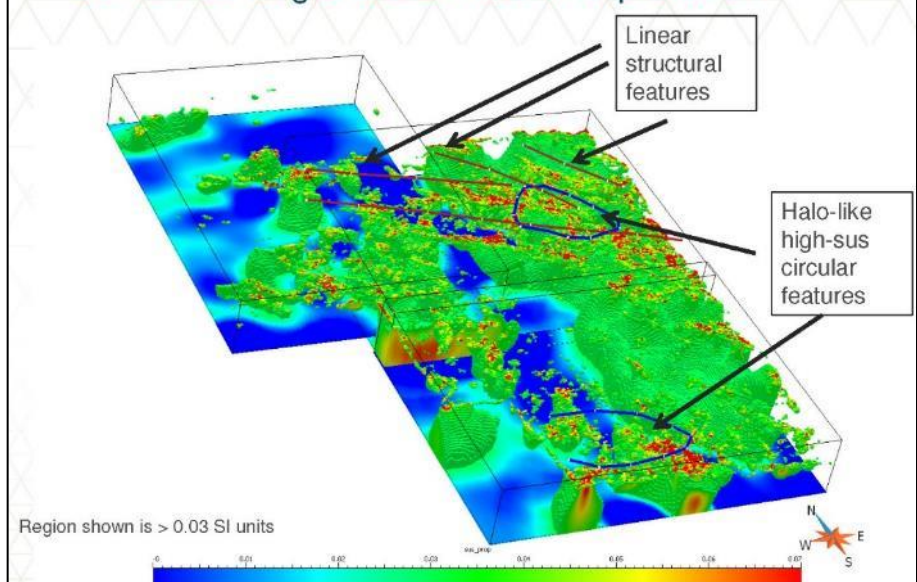
Previous geophysics were flown on a wide spacing in the early 1980's. Aeroquest UTS were engaged to fly a geophysics survey with a nominal sensor height at 50m, 200m line spacing, and a tie line every 2,000m, covering a total distance of 4,085-line kilometres. The following products were produced and are shown below in Figures 7 to 11. MIRA Geoscience produced preliminary unconstrained 3D inversion modelling and the initial magnetic susceptibility heterogeneous model.

A Lidar topographic airborne survey was carried was completed in late 2012 by Fugro Spatial Solutions Pty Ltd of Perth Western Australia, to enable efficient target selection and field sample planning.

## New Britain - Gridded Data Products MAG



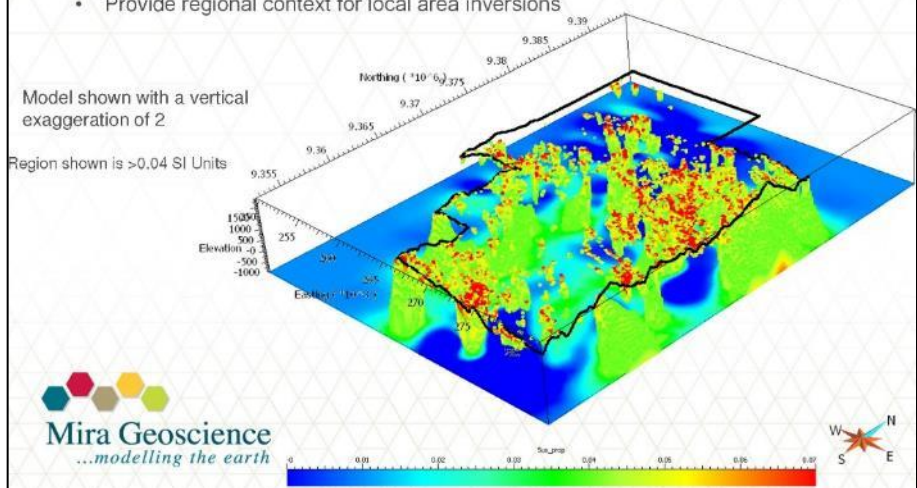
## Combined target areas initial interpretation



## Regional 3D Heterogeneous Inversion

### 200mx200mx50m Unconstrained Regional Inversion

- 1.5km depth
- Establish regional trends and character of major susceptible features
- Provide regional context for local area inversions

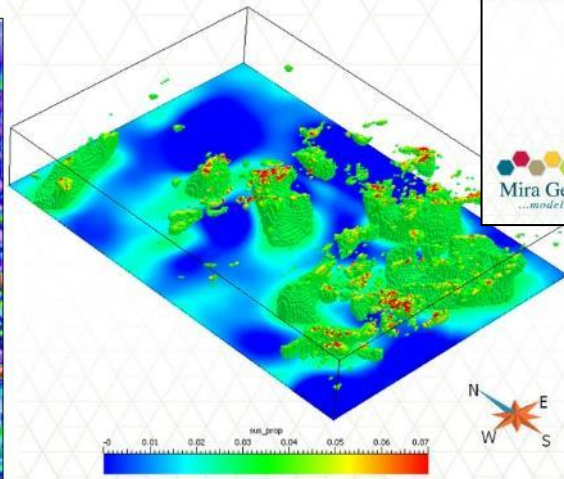
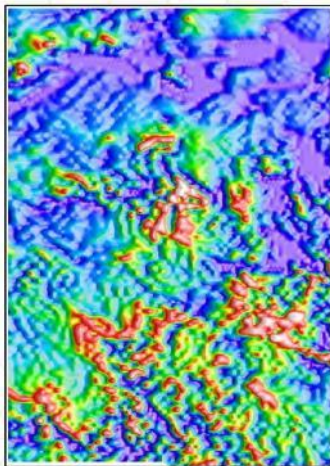




## Target Area A

### 100m Resolution Unconstrained Local Inversion

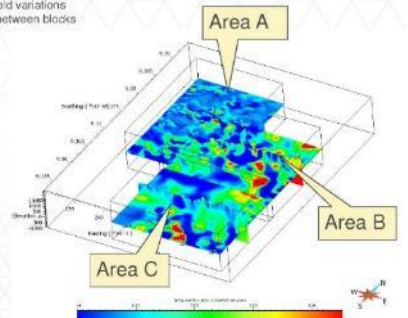
Regional Apparent Susc



Region shown is > 0.03 SI units

## Local Unconstrained Inversions

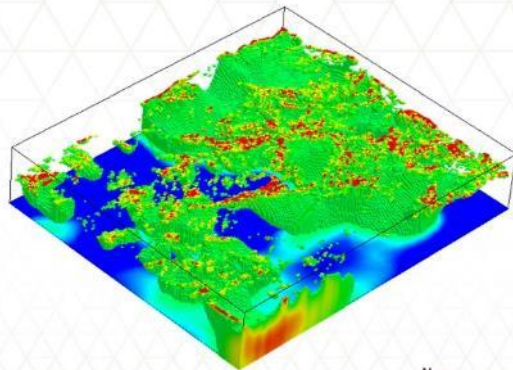
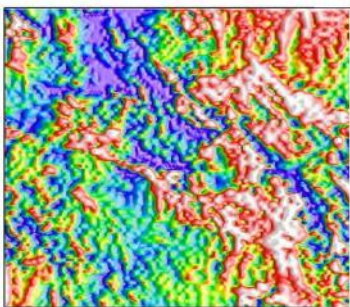
- 3 local target regions created for 100x100x50m resolution unconstrained heterogeneous inversions
- Each inversion run incised into the regional apparent susceptibility model
  - Account for regional field variations
  - Maintain consistency between blocks



## Target Area B

### 100m Resolution Unconstrained Local Inversion

Regional Apparent Susc



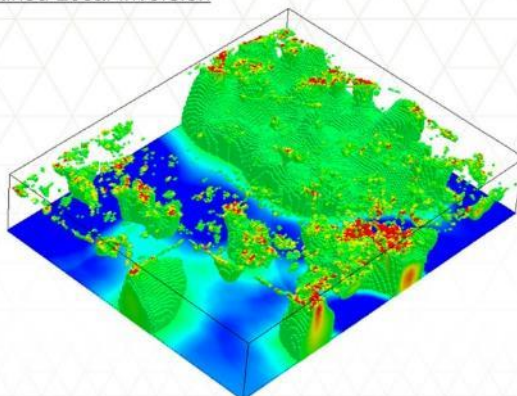
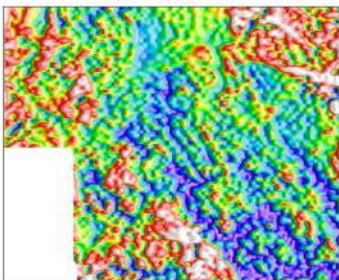
Region shown is > 0.03 SI units

Mira Geoscience  
...modelling the earth

## Target Area C

### 100m Resolution Unconstrained Local Inversion

Regional Apparent Susc



Region shown is > 0.03 SI units

Mira Geoscience  
...modelling the earth



## ELA 2513 KOL MOUNTAINS - INFORMATION SUMMARY

Frontier Resources Limited (**Frontier**) is pleased to announce summary information regarding ELA 2513, located in the Kol Mountains, between Wide and Open Bays in West and East New Britain Provinces, Papua New Guinea. Access to the area is good with logging tracks to the north end of the EL / Bukuam Prospect.

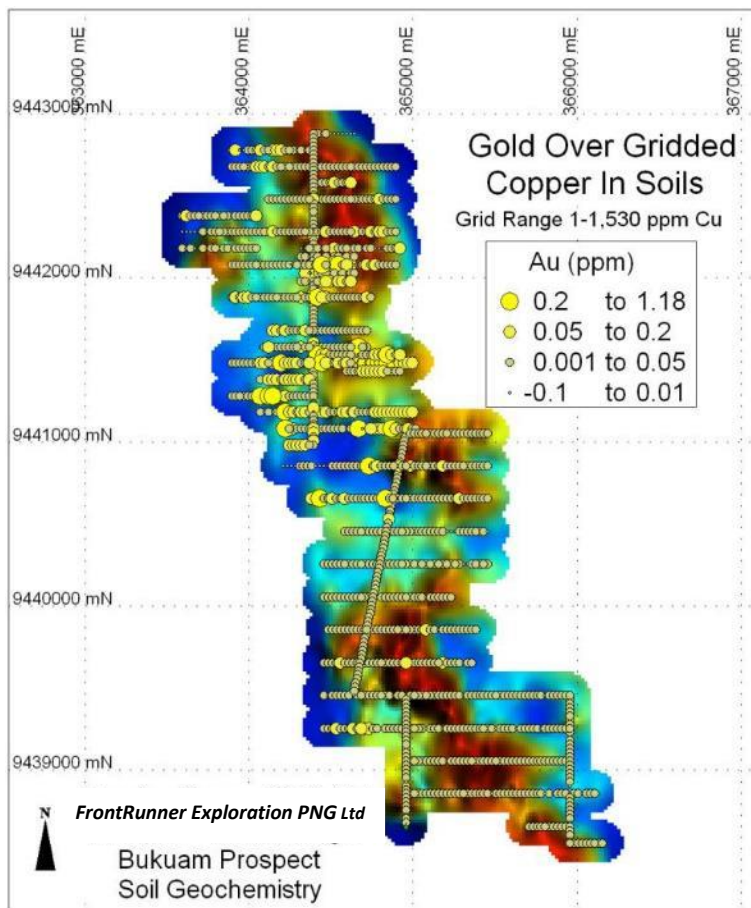
The Kol Mountains ELA is prospective for porphyry copper, gold - silver -zinc skarn and /or epithermal gold deposits. The area contains the Bukuam porphyry copper/molybdenum/gold/zinc soil anomalies and the Esis porphyry occurrence, which are situated about 14km opposite each other on the flanks of the Esis-Sai granitoid complex.

**Bukuam** is in a 5.5km x 1.2km copper in stream sediment anomaly with an open ended, 4.8km long base and precious metal soil anomaly. Trenching returned 205m at 1.9 g/t gold (including 5m at 13.1 g/t gold) and 70m at 1.7 g/t gold. Limited diamond drilling on skarns returned 6m at 2.2g/t gold + 9.5 g/t silver + 1.2% zinc.

The soil assays are still open to the north and the south, with some probable width extensions to the east. The copper soil anomaly in the southern section of the grid is higher in overall tenor than the northern section, with 10 assays reporting >0.1% copper.

The length of the Bukuam mineralised system in soils reflects high prospectivity for the discovery of a 'World Class' copper - molybdenum (+/-) gold deposit.

**Esis** had fifteen diamond core holes drilled in 2012 by the Frontier / OTML JV for a total of 7,590.9m. Results included 238m grading 0.37% copper (from 3m to 241m) in hole NBE001, 184m grading 0.30% copper (from 2m to 186m) in hole NBE002, 199m grading 0.28% copper (from 0m to 199m) in hole NBE003 and 306.8m grading 0.28% copper (from 18m to 324.8m) in hole NBE005.



Multiple zones of copper mineralisation have been shown to extend over a +1,100m strike length in drill holes. The copper anomalism is open in all directions with porphyry copper mineralisation demonstrated over a +750m strike length between mineralised intercepts in drill holes NBE002 and 006.

The copper mineralisation is open at depth at +700m vertically below surface in multiple zones including NBE001, which terminated in 0.41% copper. Hole NBE007 was terminated with 233.8m grading 0.20% copper to 602.7m, also showing mineralisation to the west of the long section line (60-degree inclination). The mineralisation is open to the east with holes including Hole NBE004 - terminated in 0.38% copper at 719.9m (60-degree inclination).

There are signatures of porphyry style alteration and the mineralised breccias in NBE015 suggest these structures are possible conduits that tap into a larger mineralising porphyry system at depth.

## Kol Mountains - Ela 2513 Summary

The Kol Mountains ELA is prospective for porphyry copper, gold - silver -zinc skarn and /or epithermal gold deposits. The area contains the Esis porphyry occurrence and the Bukuam porphyry copper, molybdenum, gold and zinc soil anomalies, which are situated about 14km opposite each other on the flanks of the Esis-Sai granitoid complex.

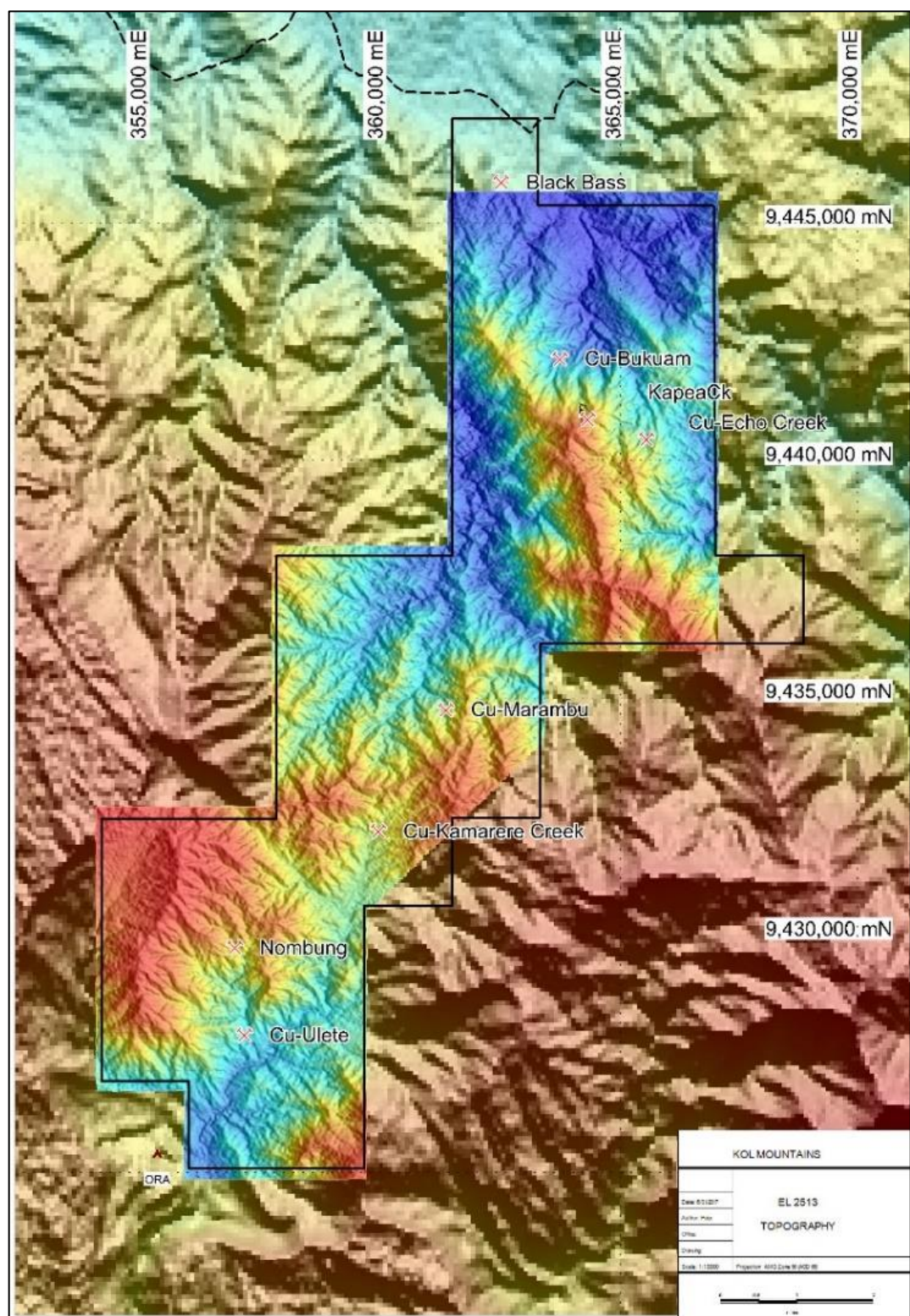
New Britain forms part of the volcanic island arc system that developed during the Palaeogene period. Intrusive porphyry copper-gold and high-level epithermal gold deposits are affiliated with similar island arc systems elsewhere in Papua New Guinea. The ELA covers a total area of approximately 123 km<sup>2</sup>, located about 100km southeast of Rabaul straddling the East and West New Britain Provinces of Papua New Guinea.

The stratigraphy of the Gazelle Peninsula of New Britain is dominated by pre-Miocene sequence which consists of the Baining Volcanics. This sequence is intruded by acid to basic intrusive rocks of late Oligocene. This extrusive-intrusive sequence is confined to the north and is host to a number of copper-gold occurrences.

The Merai Volcanics occur to the southwest and consist of tuff, andesite breccia, conglomerate and limestone. The Mio-Pliocene sequence is dominated by the reefal Yalam Limestone, unconformably overlain by the Nengmutka Volcanics. These volcanics which host the Wild Dog (Sinivit) epithermal gold deposit, are composed of fluvial and pyroclastic-epiclastic sediments interbedded with pyroclastic flow deposits and andesites. These volcanics have been deposited in a caldera related environment.

The Sinivit Formation is dominated by volcanoclastic sandstone and siltstone with minor conglomerate and limestone. These are both marine and terrestrial intercaldera sequences associated with the Nengmutka, Keravat and Sikut Calderas. The main structural features in the region include the Baining Mountain Horst and Graben Zone and the spatially related caldera systems. The Wide Bay Fault system parallels the Baining Mountain Structural Zone.

The tenement contains at least three target types/ areas of interest, being porphyry copper at Esis and Bukuam, high grade gold and base metals in skarns at Bukuam and high-level, epithermal and include the Esis-Ulete porphyry copper deposit (located to the south), the Kamarere and the Nombung anomalies. The Nombung anomaly is situated around Nombung and Ulete creeks and the Esis River to the south. The Bukuam Prospect occurs in the head waters of Sai River and lies within the NW-SE striking Wide Bay Fault Zone (WBFZ). The Sai River drains through Open Bay to the Bismarck Sea.





## Previous Exploration

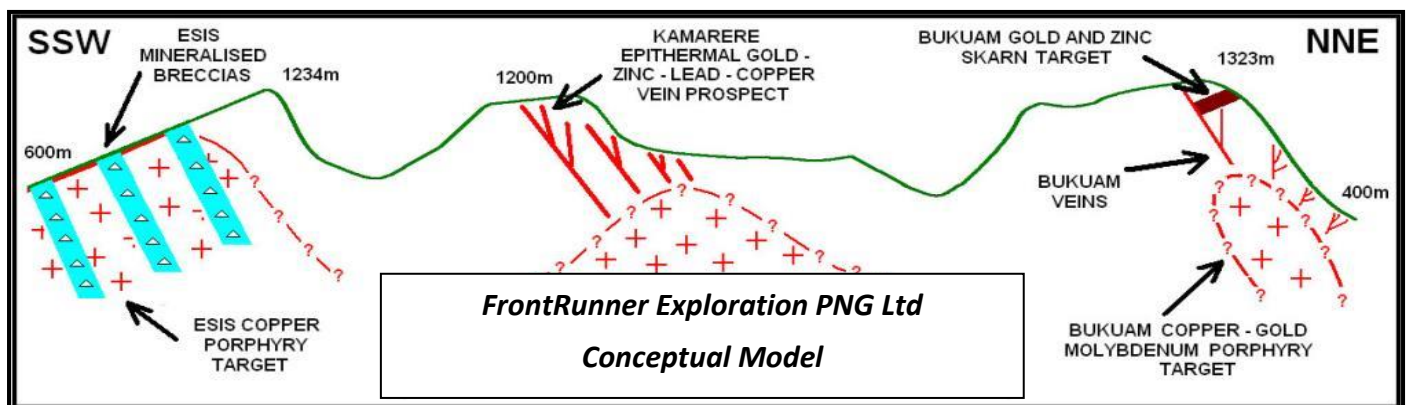
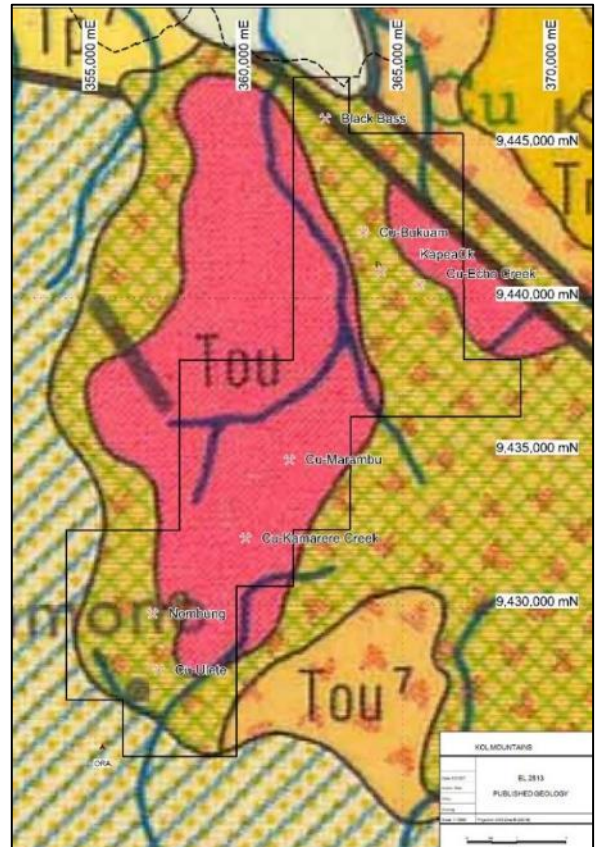
BHP and CRA carried out extensive work in the area between the late 1960s to late 1980's in the Bukuam zinc-Cu-gold skarn area and the Esis Prospects. These prospects had very limited drill testing prior to the Frontier/OTML JV.

The Bukuam Prospect contains high surface gold values within a mineralised silicate-sulphide skarn body, which is situated adjacent to the upper Oligocene Esis-Sai intrusive granitoid complex. Trenching returned 205m at 1.9 g/t gold (including 5m at 13.1 g/t gold) and 70m at 1.7 g/t gold from two different zones. Results from the diamond drilling returned a best intercept of 6m at 2.2g/t gold + 9.5 g/t silver + 1.2% zinc.

The Esis-Ulete porphyry copper deposit occurs within mineralised quartz-diorite breccias on the western flanks of the Esis-Sai granitoid complex.

Frontier and OTML JV drilled fifteen diamond core holes at Esis for a total of 7,590.9m and multiple zones of copper mineralisation have been shown to extend over a +1,100m strike length in drill holes and the mineralisation is open in all directions (along strike N and S, across the width from E to W and at depth).

Porphyry copper mineralisation was demonstrated over a +750m strike length between mineralisation in drill holes NBE002 & 006.



Drill results include:

- 238m grading 0.37% copper (from 3m to 241m) in hole NBE001.
- 184m grading 0.30% copper (from 2m to 186m) in hole NBE002.
- 199m grading 0.28% copper (from 0m to 199m) in hole NBE003.
- 274.2m of 0.25% copper (from 4m to 278.2m), plus 18m of 0.30% copper from 691m to 709m in NBE004.
- 306.8m grading 0.28% copper (from 18m to 324.8m) in hole NBE005.
- 232.5m grading 0.27% copper (from 3.5m to 236.0m) in hole NBE006.
- 138.0m grading 0.23% copper (from 0m to 138m), plus 233.8m grading 0.20% copper (from 368.9m to 602.7m EOH) in hole NBE007.

The copper mineralisation is open at depth (+700m vertically below surface) in multiple zones.

- Hole NBE001 was terminated in 0.41% copper at 697.6m (drilled vertically).
- Hole NBE007 was terminated with 233.8m grading 0.20% copper to 602.7m, also showing mineralisation to the west of the long section line (60-degree inclination).

The mineralisation is open to the east.

- Hole NBE004 was terminated in 0.38% copper at 719.9m (60-degree inclination).
- Hole NBE005 was terminated in 0.21% copper at 598.5m (60-degree inclination).

- Hole NBE006 was terminated in 14.3m grading 0.23% copper at 598.3m (60-degree inclination) with elevated molybdenum (82 ppm compared to the hole average of 25 ppm) suggesting slightly different mineralisation.

A 402m wide copper mineralised zone was intersected in NBE015 from surface and hosted primarily in andesite, basalt and siliceous breccias that are intruded by a series of felsic quartz porphyry dykes similar to NBE012. Mineralisation is dominantly pyrite-chalcopyrite and occurs as veins and along fractures in the volcanics whilst it tends to occur as disseminations within chloritised, hornfelsed and phyllic altered matrices of mineralised siliceous breccias. Alteration is dominantly phyllic, characterised by quartz-sericite-chlorite.

There are signatures of porphyry style alteration and the mineralised breccias in NBE015 suggests these structures are possible conduits that tap into a larger mineralising porphyry system at depth.

Aeroquest UTS flew an airborne geophysics acquisition; the survey commenced on the 25th June 2010 and was completed on the 22nd July 2010. Line were run North – South with a 50m line spacing and a sensor height of 30m, delivering, magnetic intensity, topography and radiometric data. The MIRA Geoscience report, inversion model, radiometric images from Aeroquest are included below. A Lidar Survey was completed in November 2012.

### Bukuum Prospect

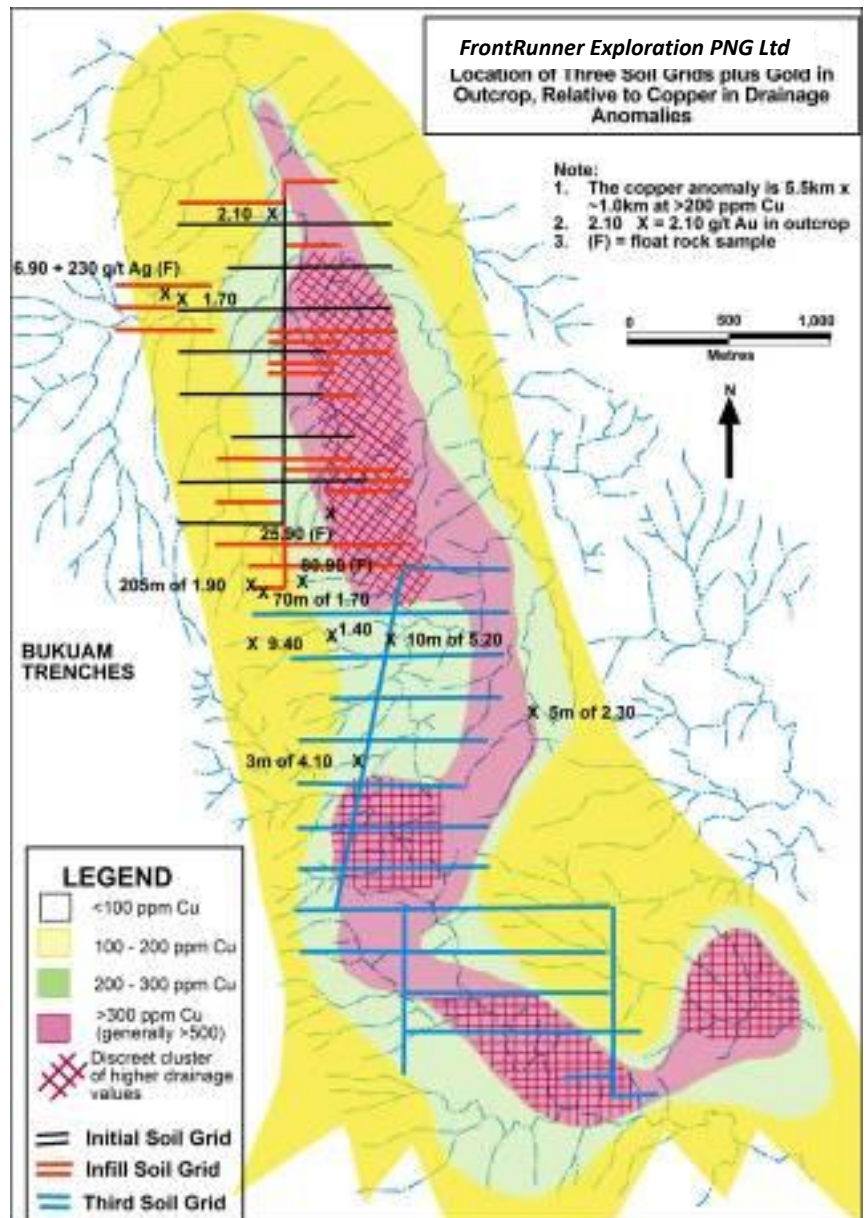
Bukuum is located in a 5.5km x 1.2km copper in stream sediment anomaly in East New Britain. It consists of an open ended, 4.8km long multi-element soil anomaly (copper + coincident molybdenum + lesser gold and silver). The anomalies are cohesive and contiguous, with mostly coincident geochemistry along most of its length.

The length of the Bukuum mineralised system in soils reflects high prospectivity for the discovery of a 'World Class' copper - molybdenum (+/-) gold deposit. The probability of discovering other target models such as of zinc – silver - gold skarns and /or high-grade shear hosted and epithermal gold is very good.

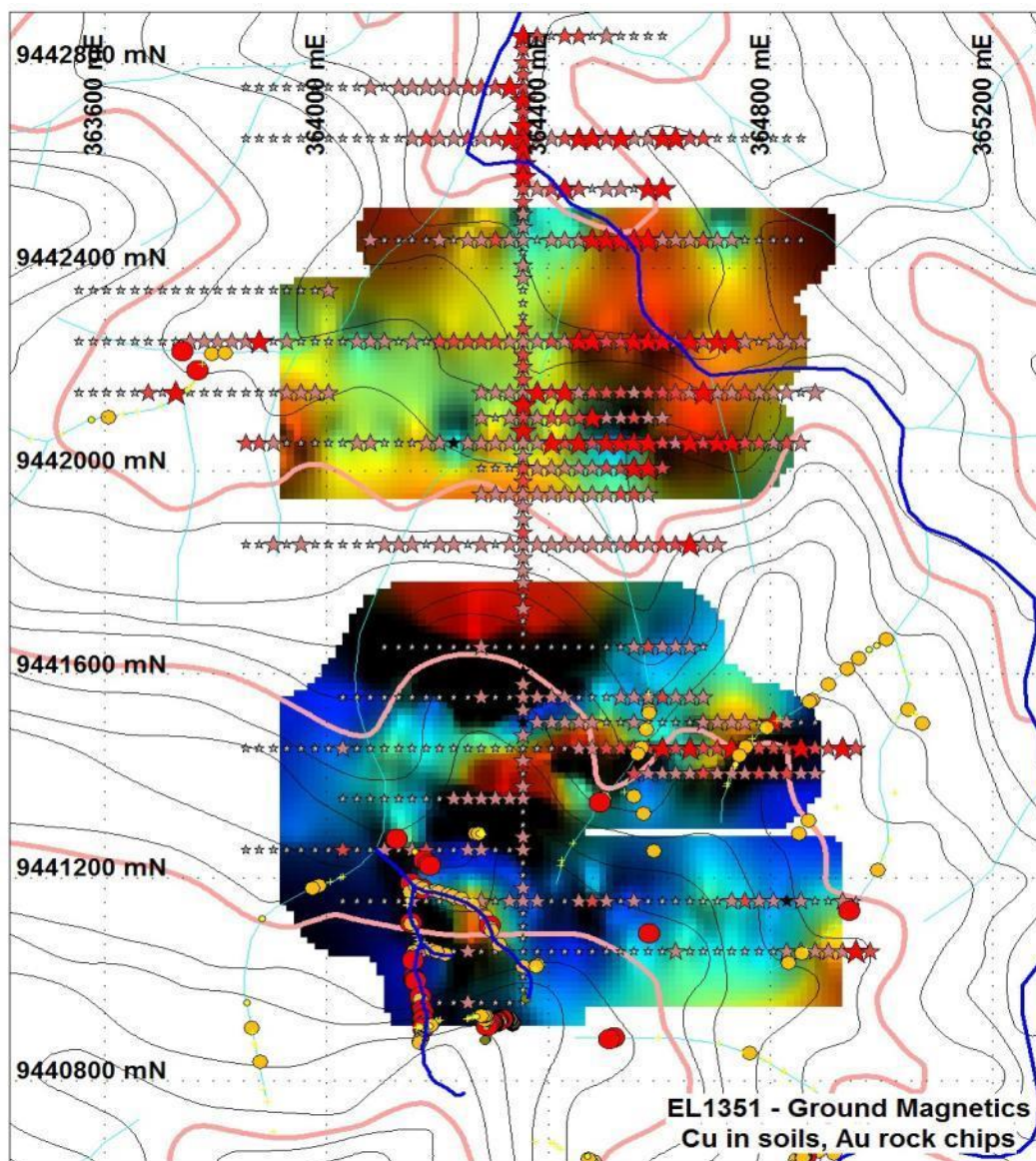
The soil assays are still completely open to the north and the south, with some probable width extensions to the east. The grid still needs to be extended another kilometre to the SE to cover the remainder of the copper in drainage anomaly. Zinc, gold and silver also show encouraging assays. Additional soil sampling will be considered to close these anomalies off.

The copper soil anomaly in the southern section of the grid is higher in overall tenor than the northern section, with 10 assays reporting greater than 0.1% copper. In comparison, the molybdenum anomalism is not as wide as in the northern section, perhaps reflecting a greater depth to the inferred copper – molybdenum mineralised porphyry.

Seven geochemically anomalous zones were evaluated in 2007 via focused pitting, hand trenching and composite rock chip sampling, plus geological mapping. It is anticipated that continued hand trenching, rock chip sampling and geological mapping will enable a good evaluation of the area and provide good targeting vectors to insitu mineralisation.

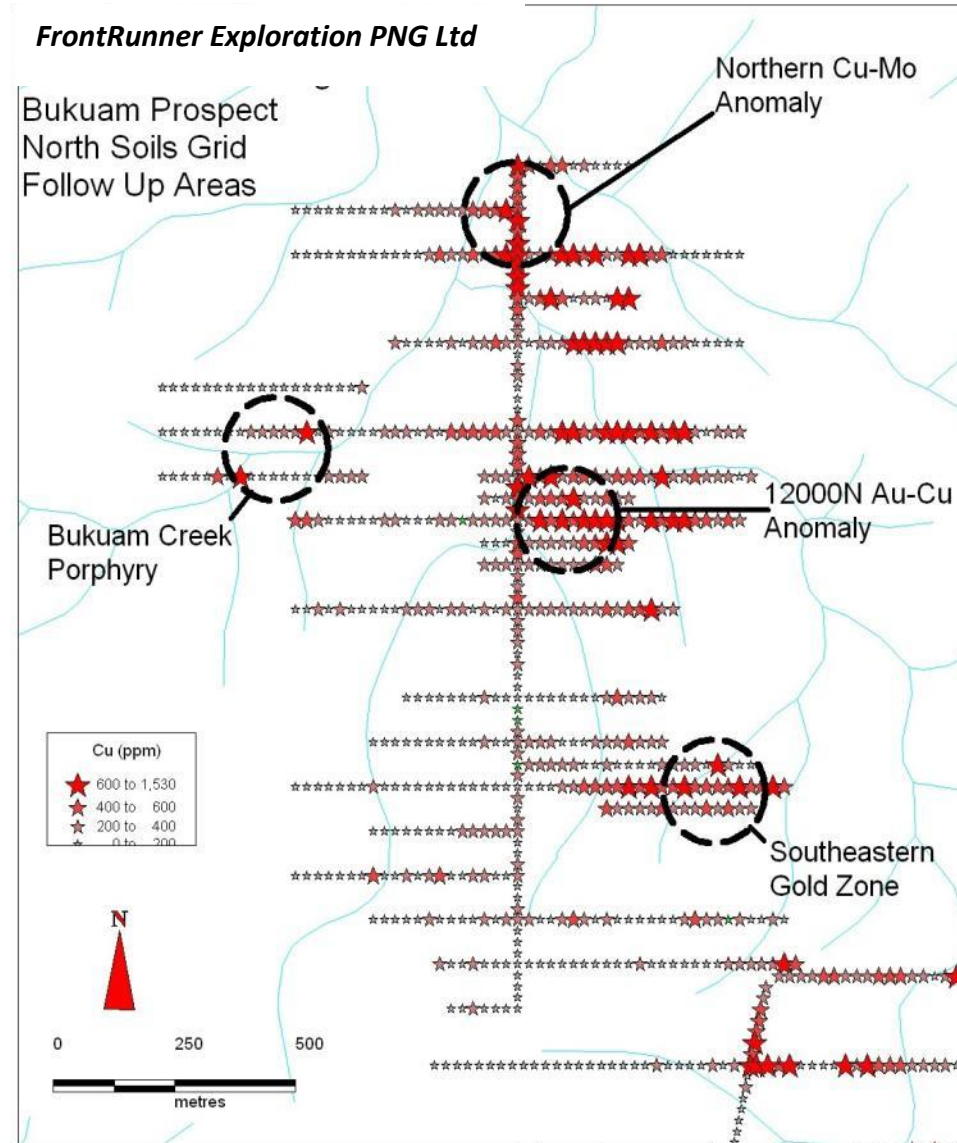


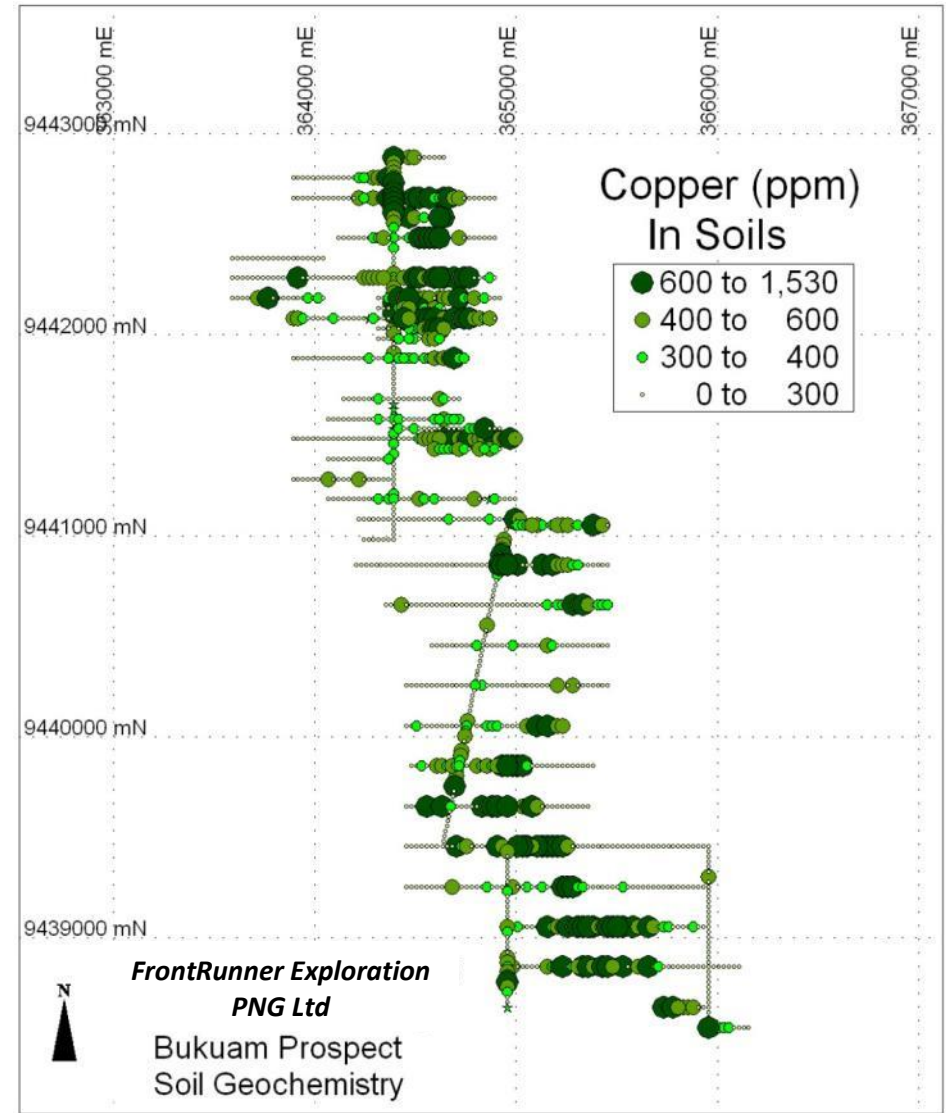
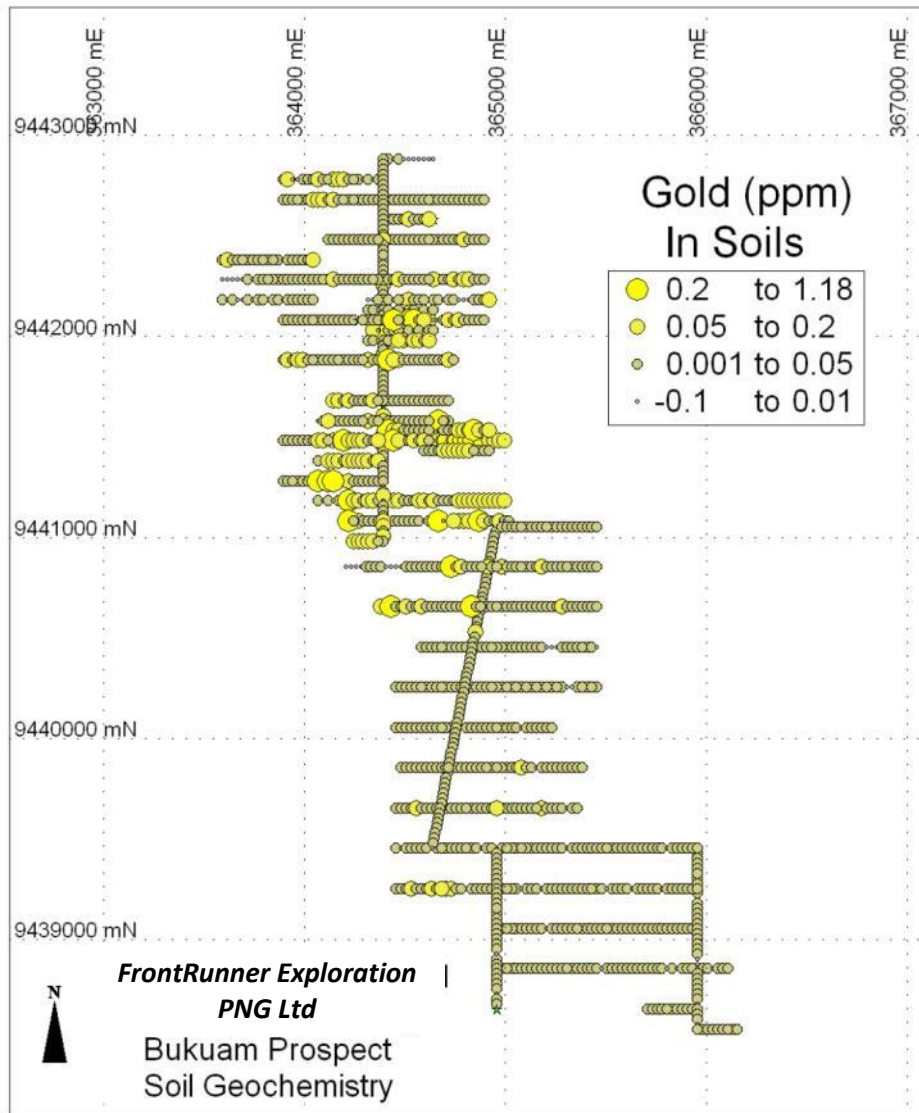




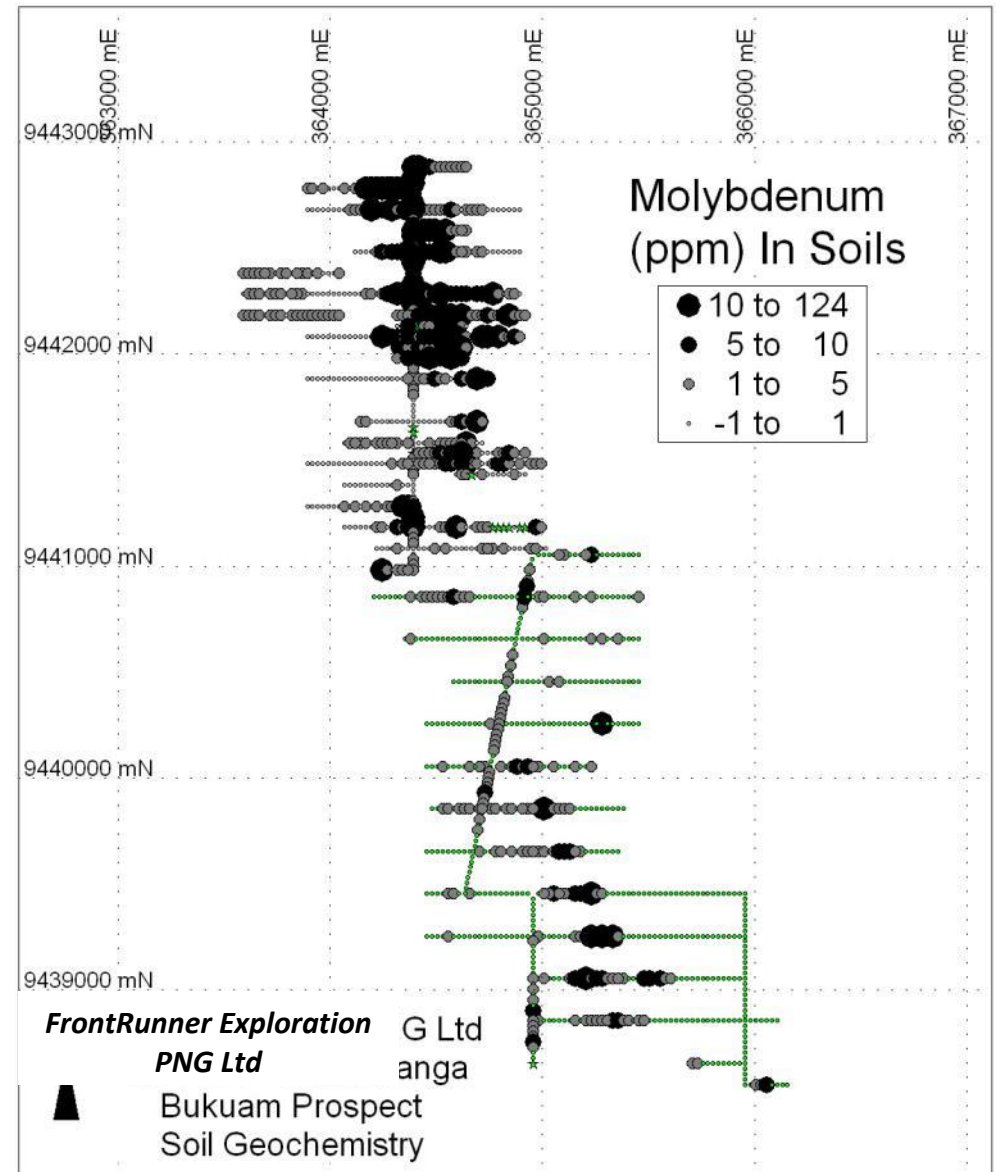
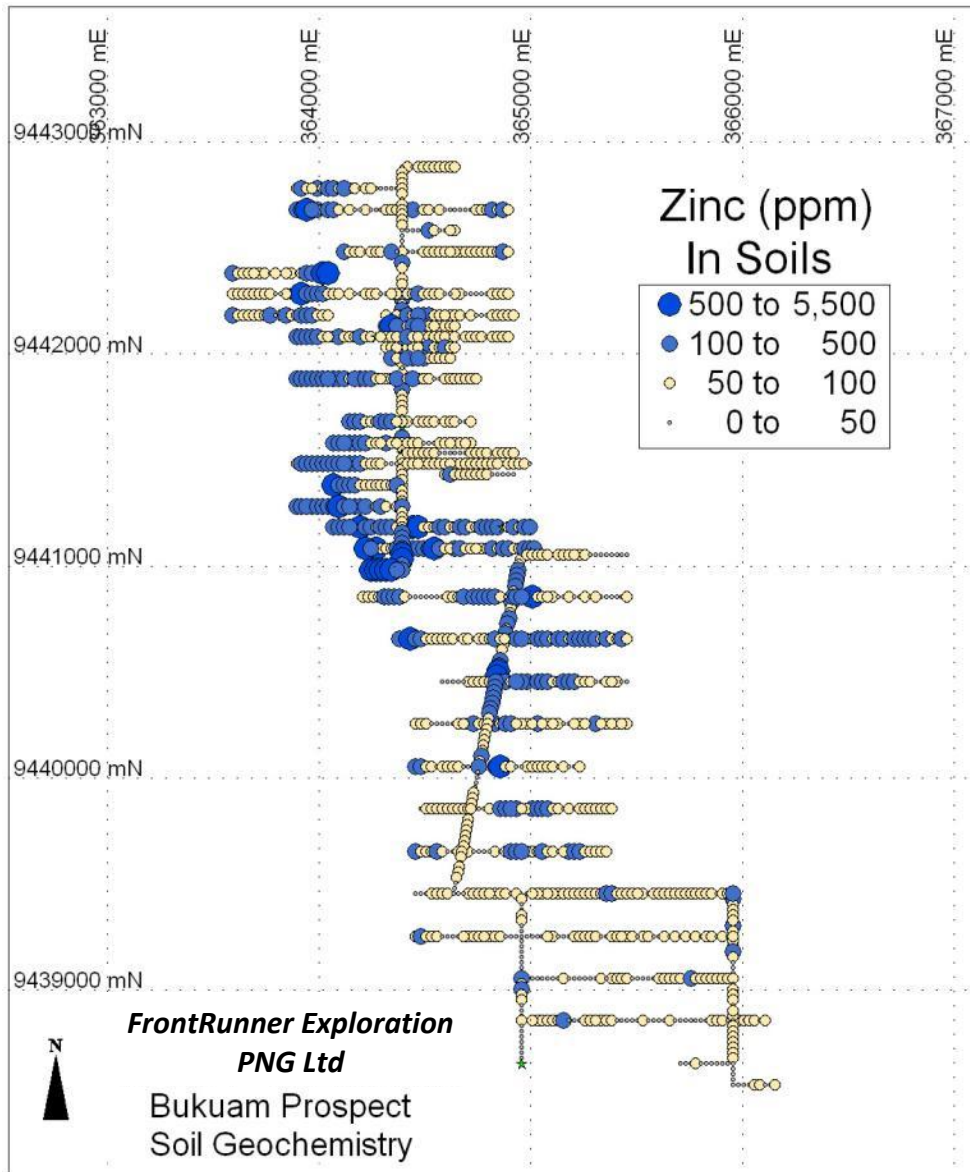
# **FrontRunner Exploration PNG Ltd**

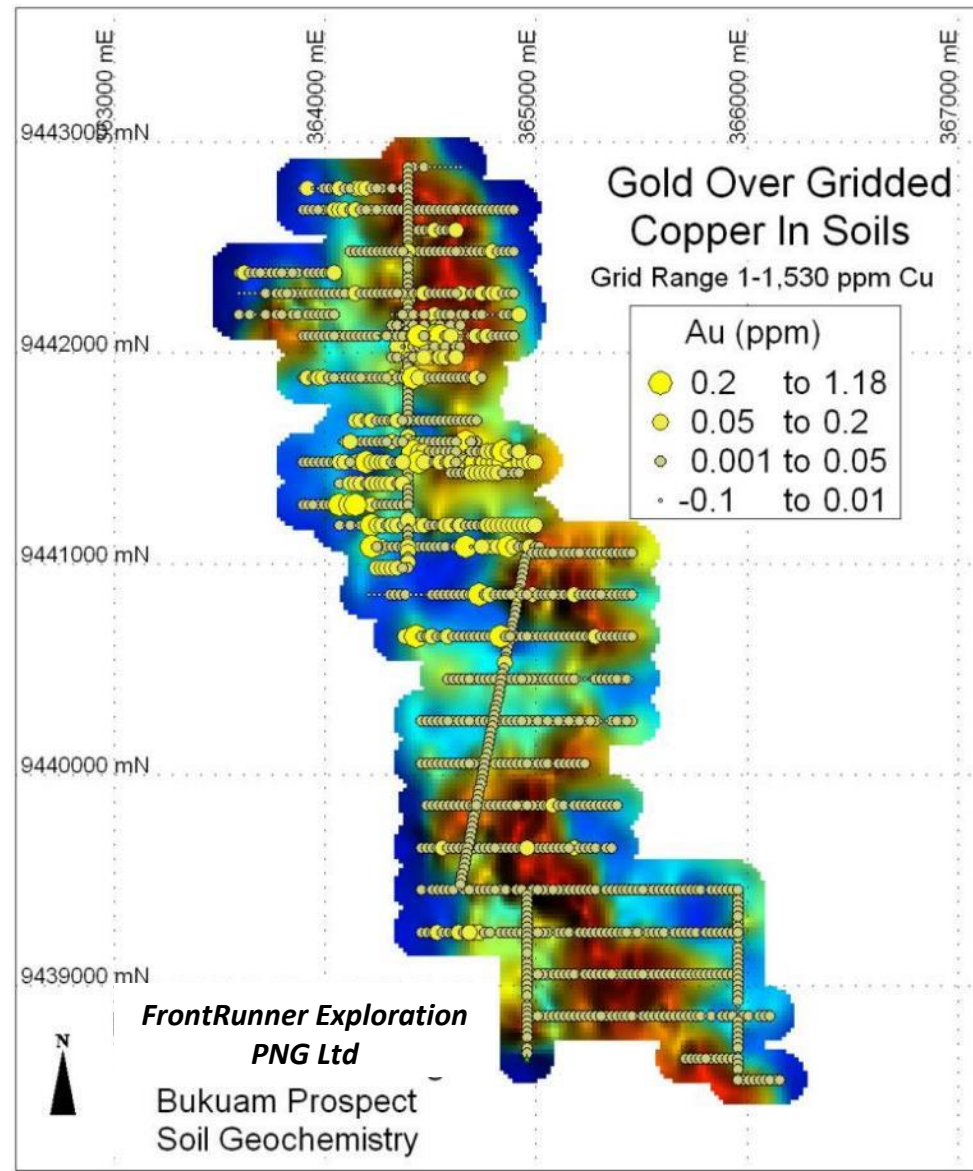
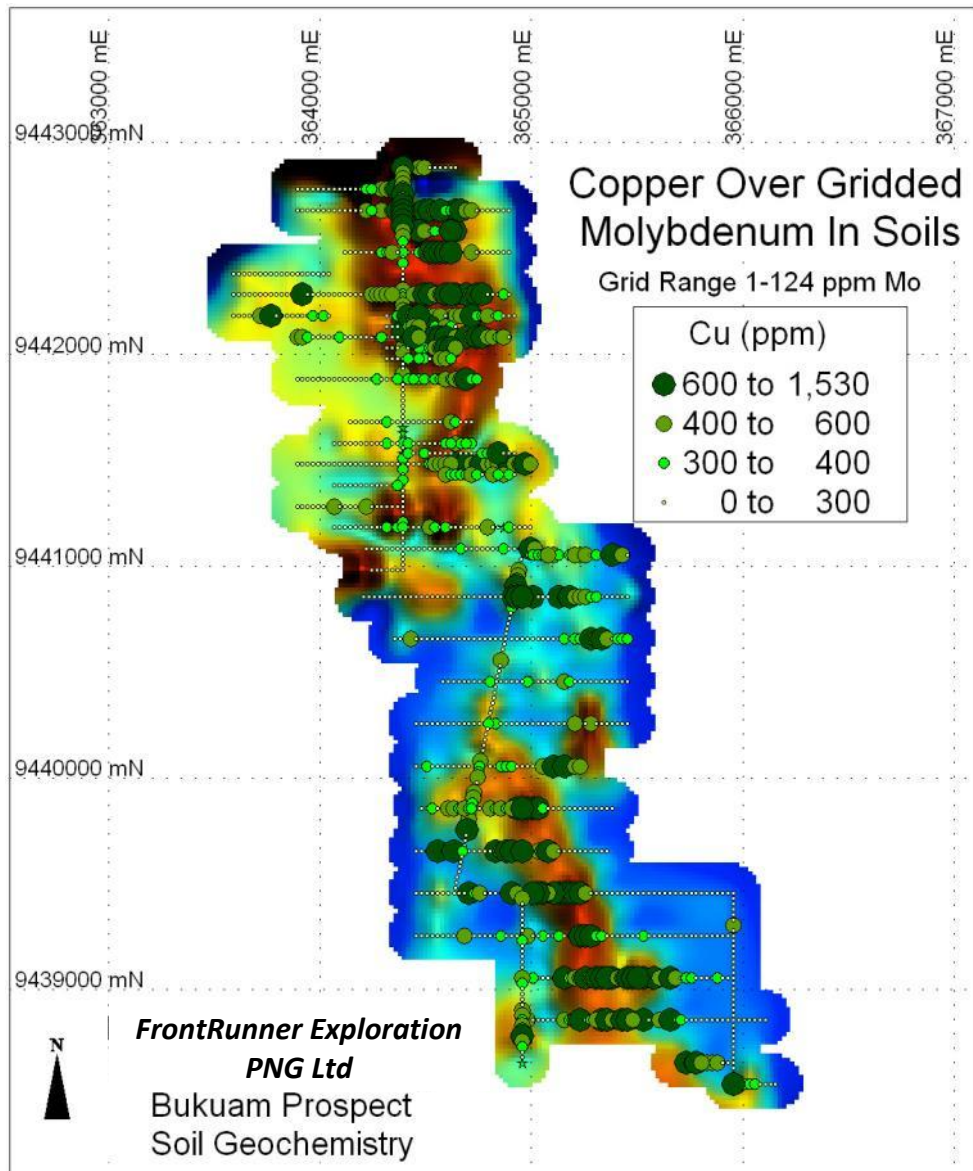
Bukuum Prospect  
North Soils Grid  
Follow Up Areas



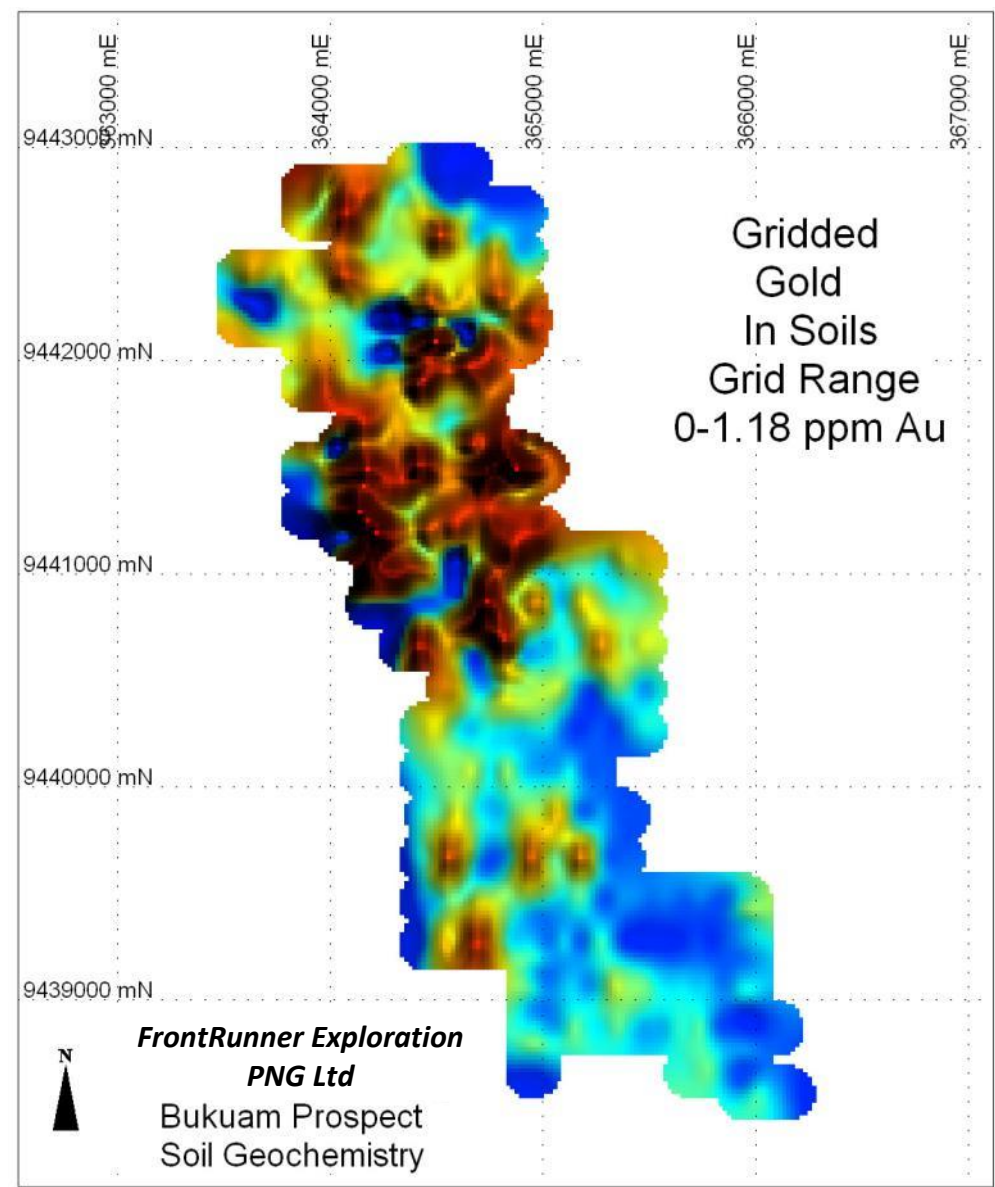
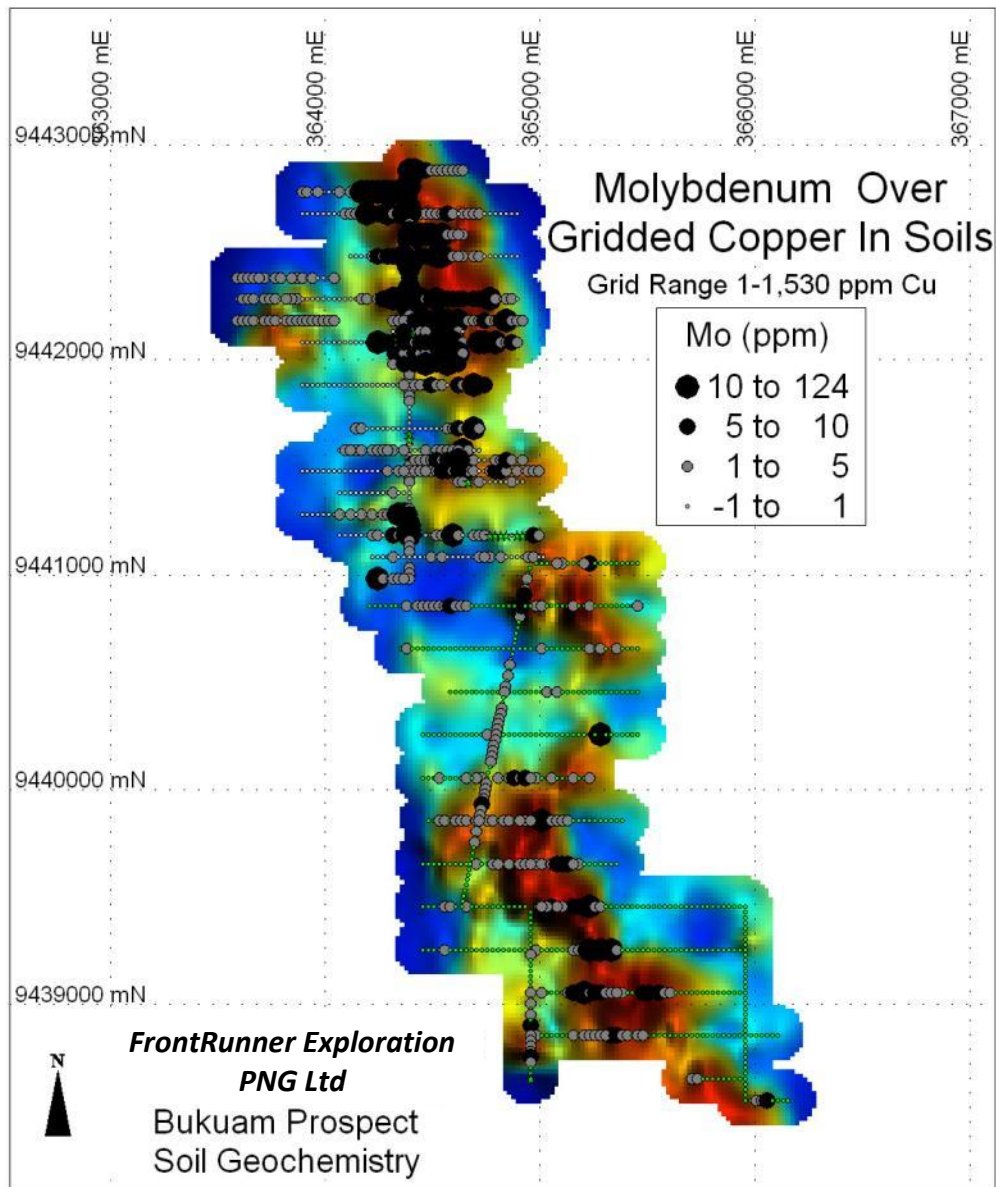








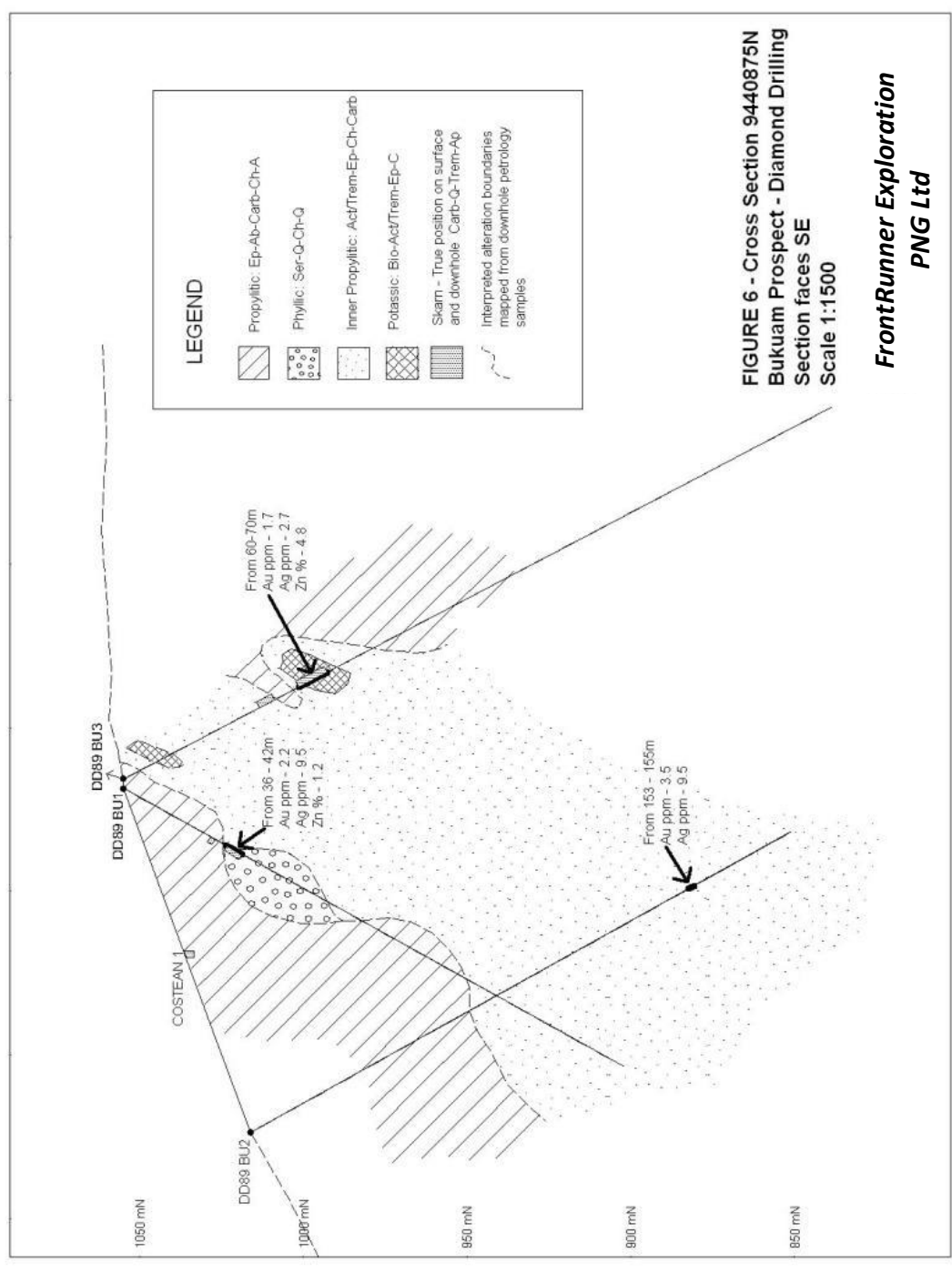
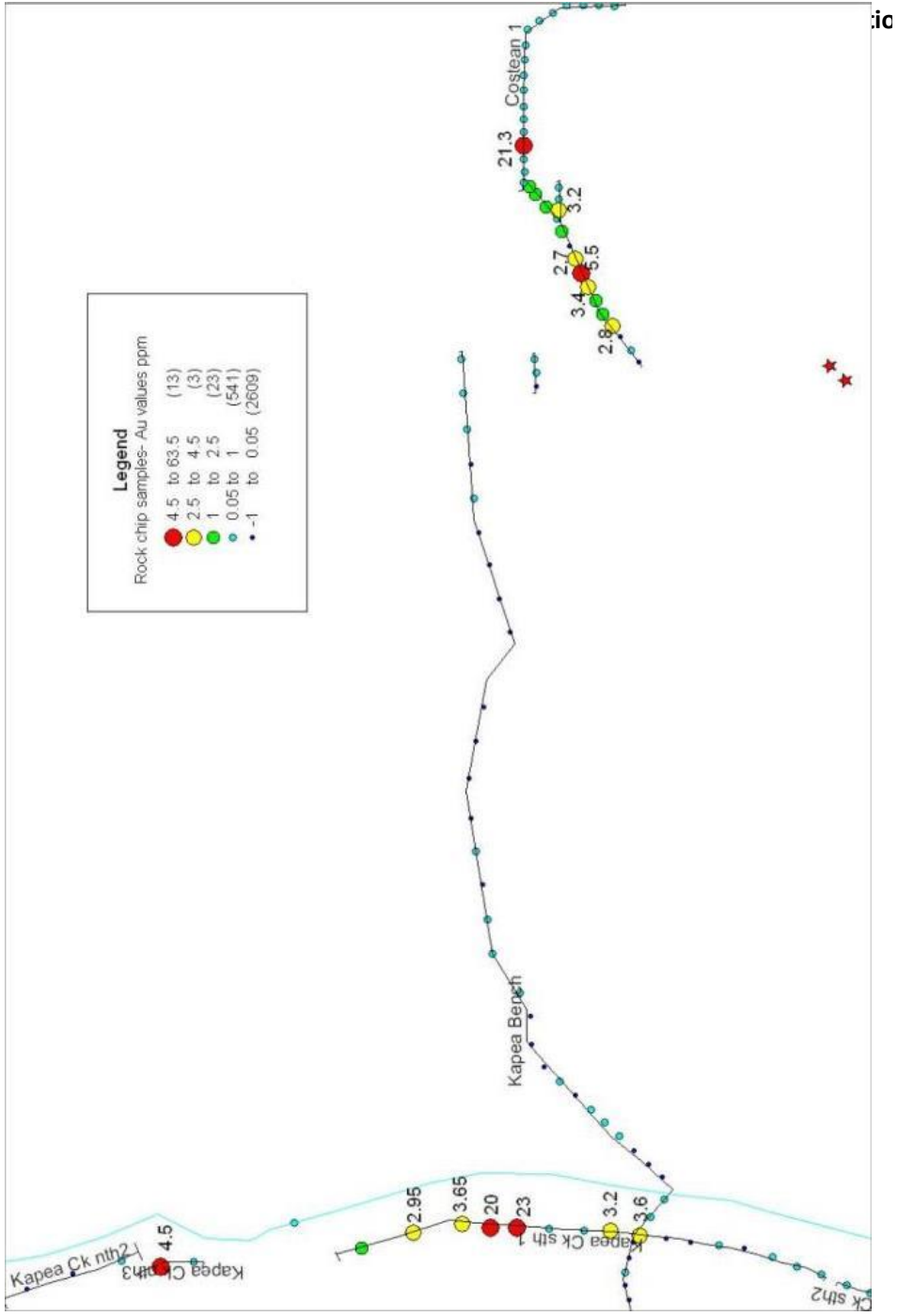








**Gold assays in rock chip sampling along trenches in Kapea and Gupa Creeks and the Costean No. 1 and the Kapea Bench.**





## Location of Drill Holes at the Bukuam Prospect (from Price, 1989)

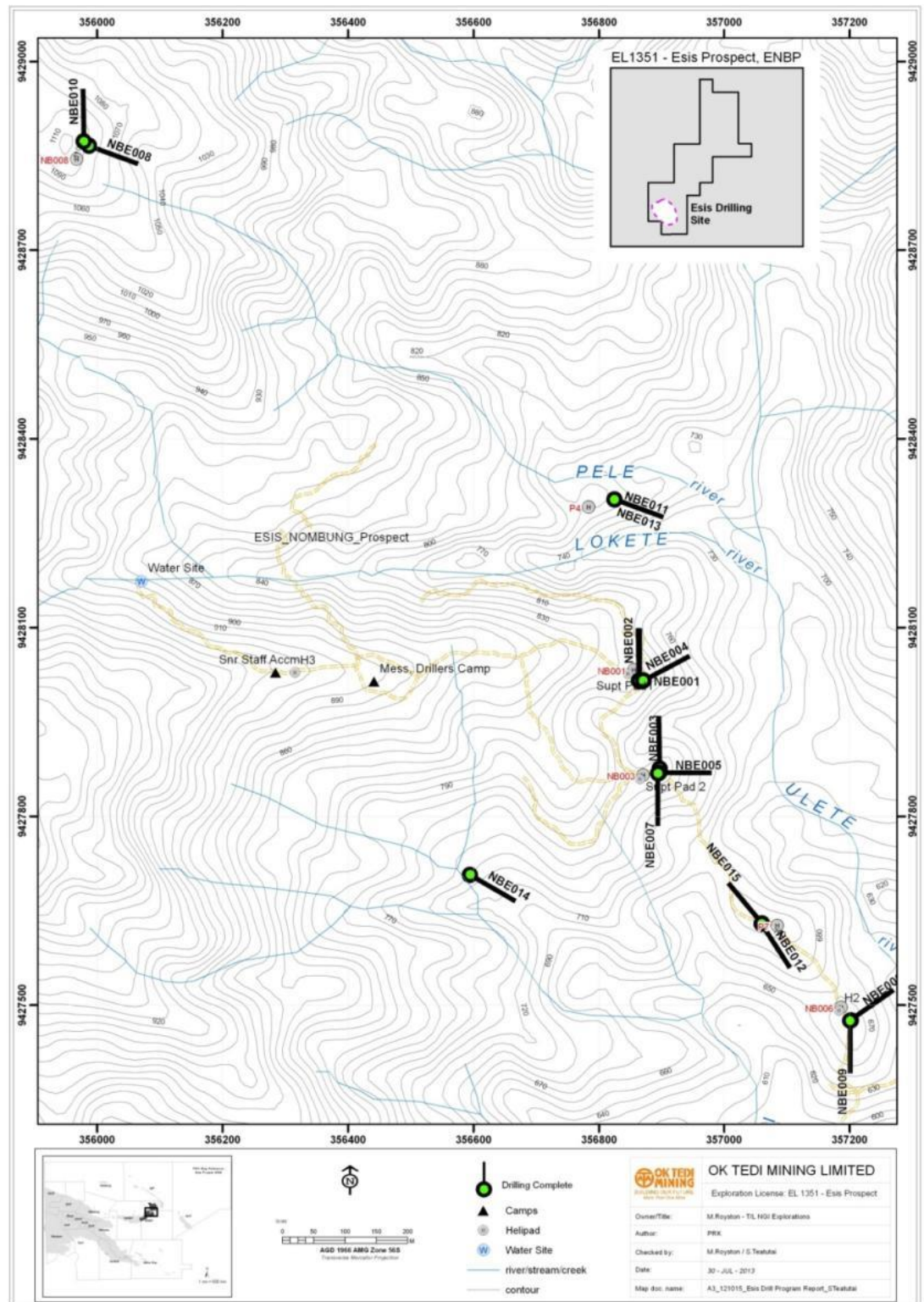
Hole No	Orientation	Depth	Easting (m)	Northing (m)	R.L. (m)
DD89BU1	-60° 030°	176.70m	9936	19932	1055
DD89BU2	-60° /210°	190.80m	10004	20011	1016
DD89BU3	-60°/250°	250.15m	9934	19931	1055

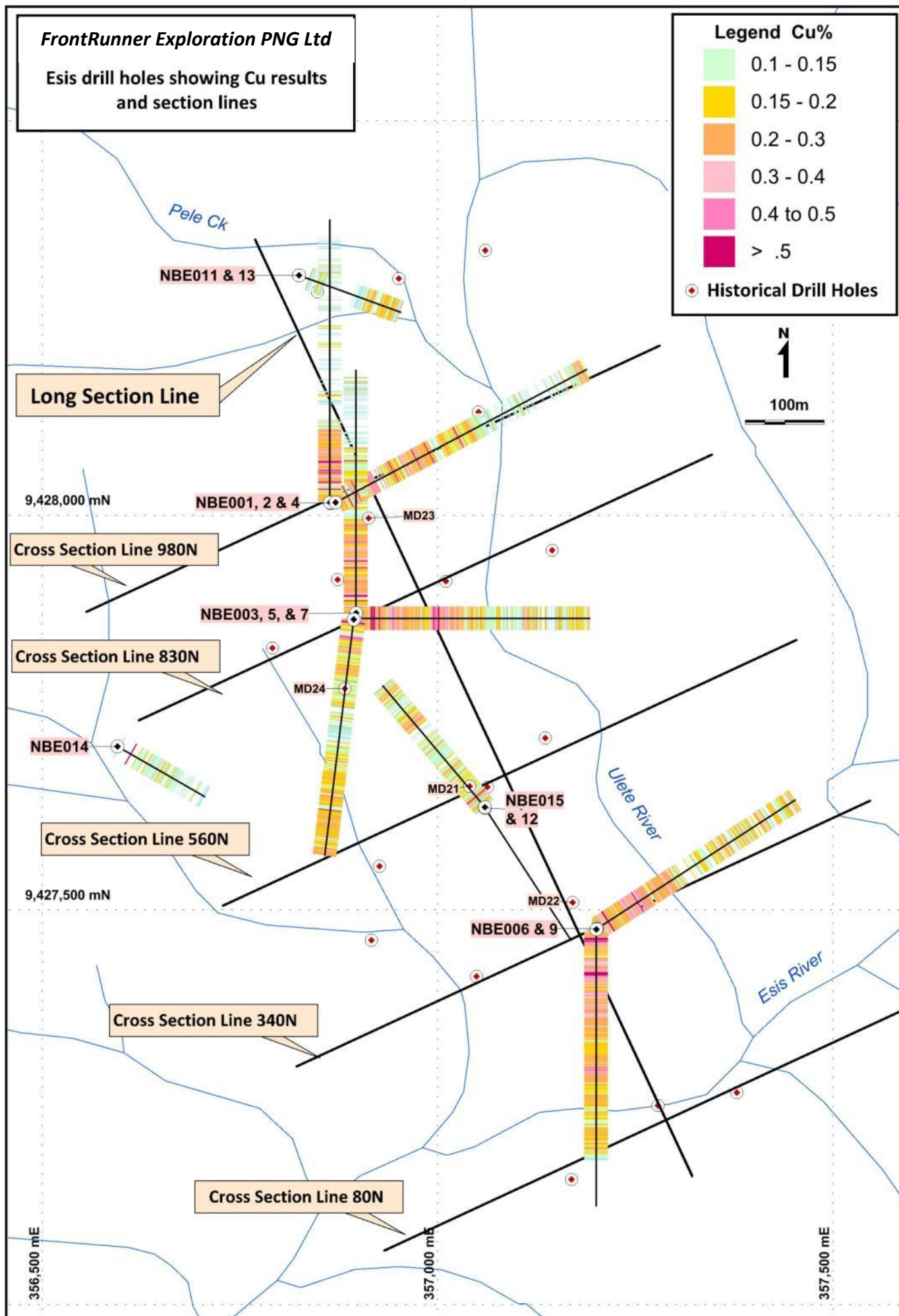
## Results of drilling at the Bukuam Prospect

Hole No	From & To (m)	Interval (m)	gold (ppm)	silver (ppm)	zinc%	Comment
DD89BU1	36-42	6	2.2	9.5	1.2	Coarse sph-py-mt skarn
DD89BU2	153-155	2	3.5	9.5	-	(0.25m) py-qtz-clay breccia zone
DD89BU3	60-70	10	1.7	2.7	4.8	skarn

## Esis Project

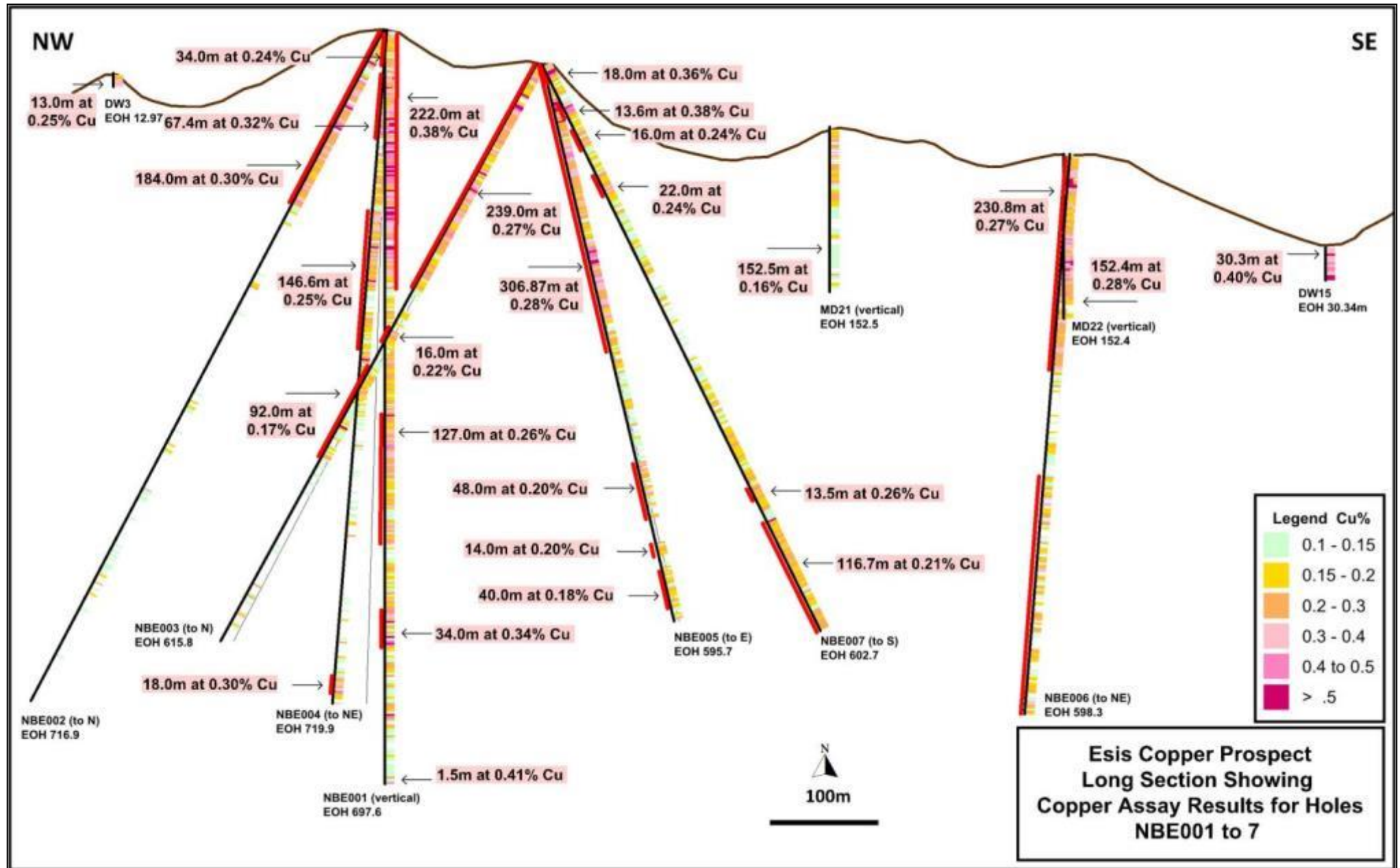
The long section displaying copper in the drill holes demonstrates the consistency of mineralisation between holes and the open nature of the anomaly to the east, north, south and at depth. There appears to be at least 3 zones of moderate grade copper mineralisation that are separated by lower grade copper intervals both horizontally and vertically (as seen in the long section and cross sections). Further drilling is warranted to investigate the depth extent of potassium feldspar-biotite potassic alteration and silicification with associated strong pyrite-chalcopyrite-molybdenite stockwork mineralisation intersected in NBE014.





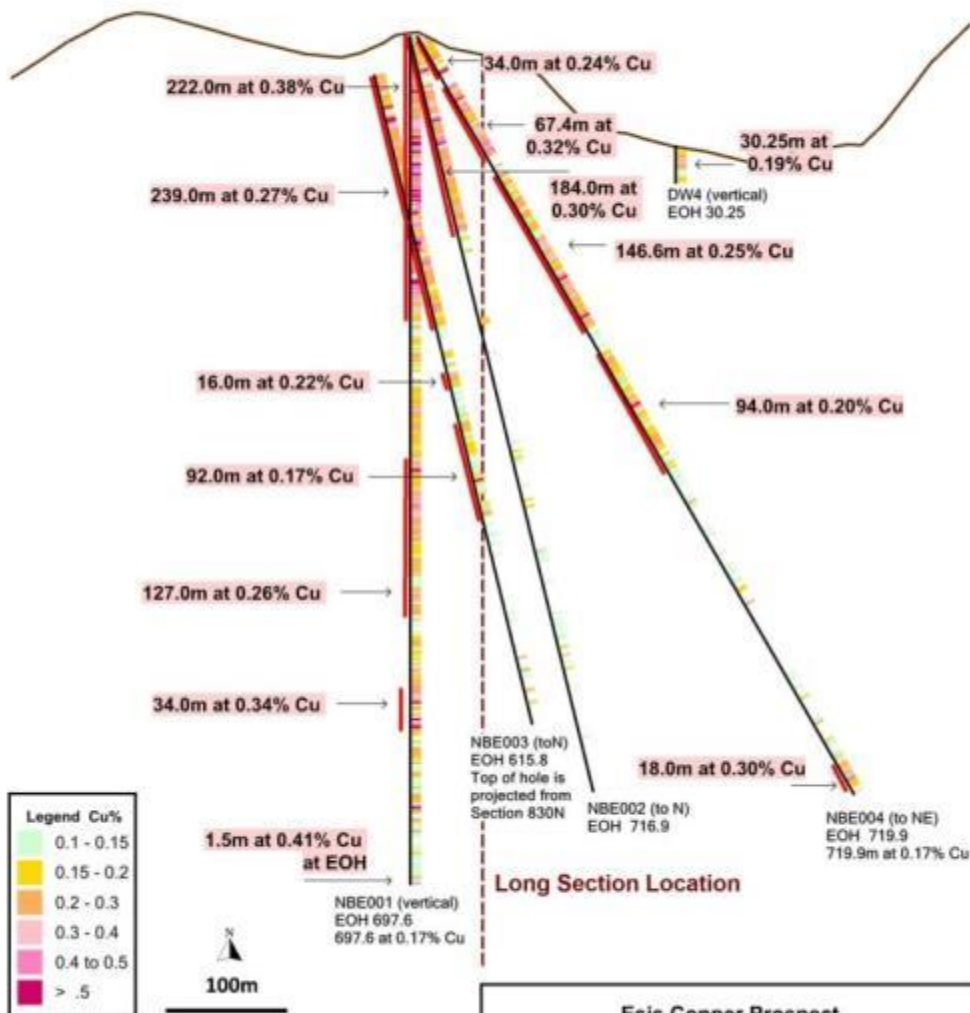


Refer to the Long Section + Cross Sections and drill hole weighted assay tables for information/ results and to visualise the orientation of the copper mineralisation. The location of the drill holes is shown on an oblique Google Earth image looking northerly (NNE).



WSW

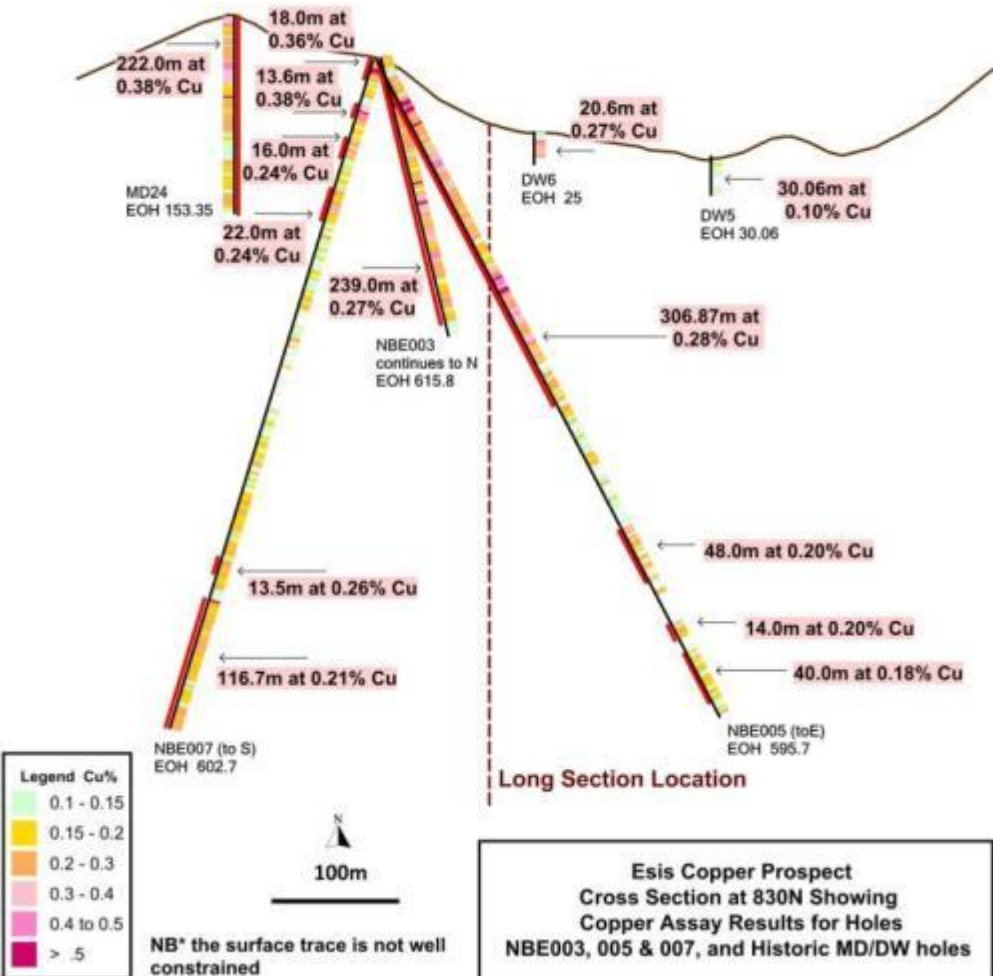
ENE



NB\* the surface trace is not well constrained  
Holes NBE002 and NBE003 have real separation  
of about 150m - the 50m shown is "apparent"

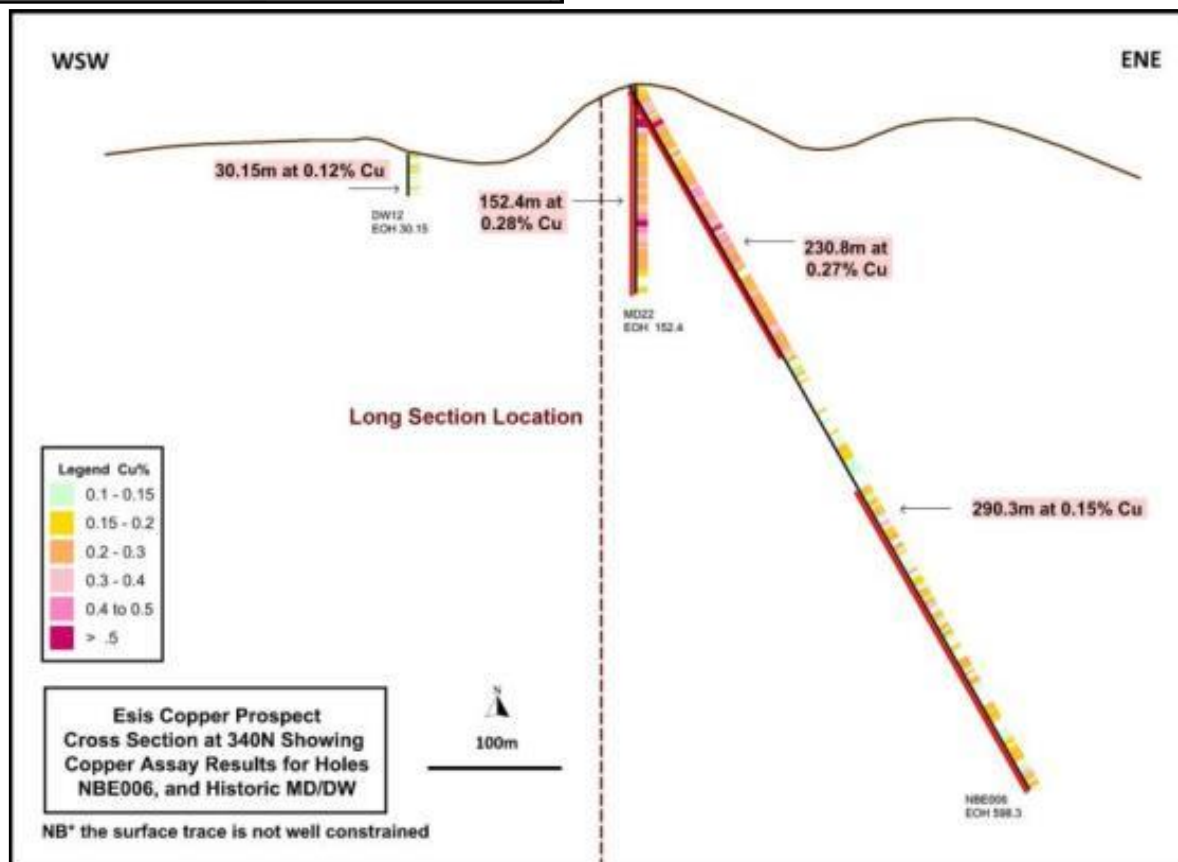
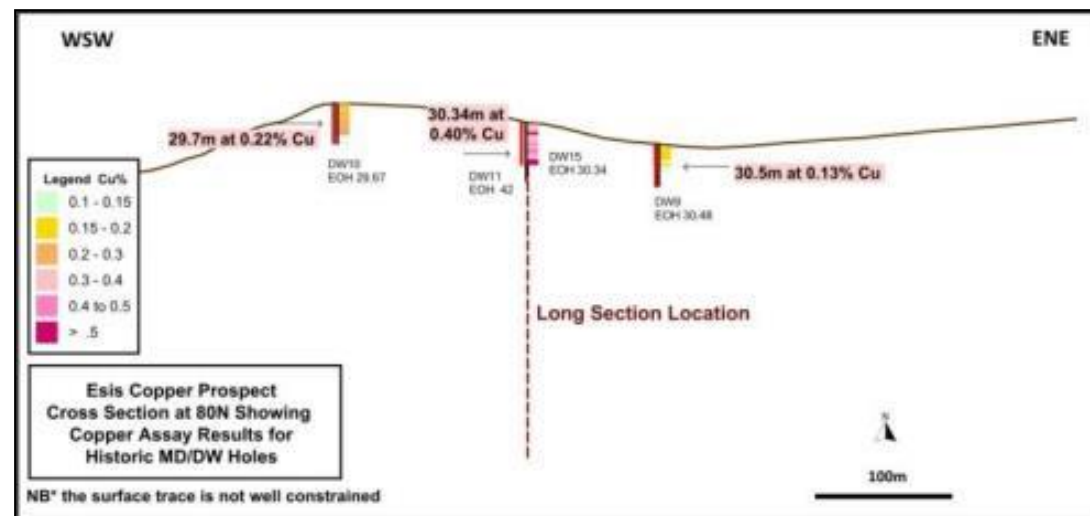
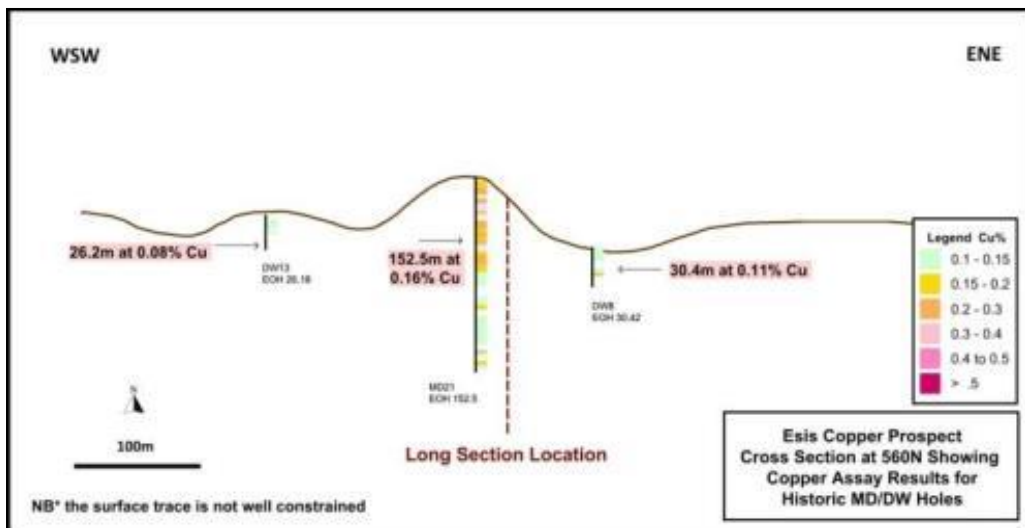
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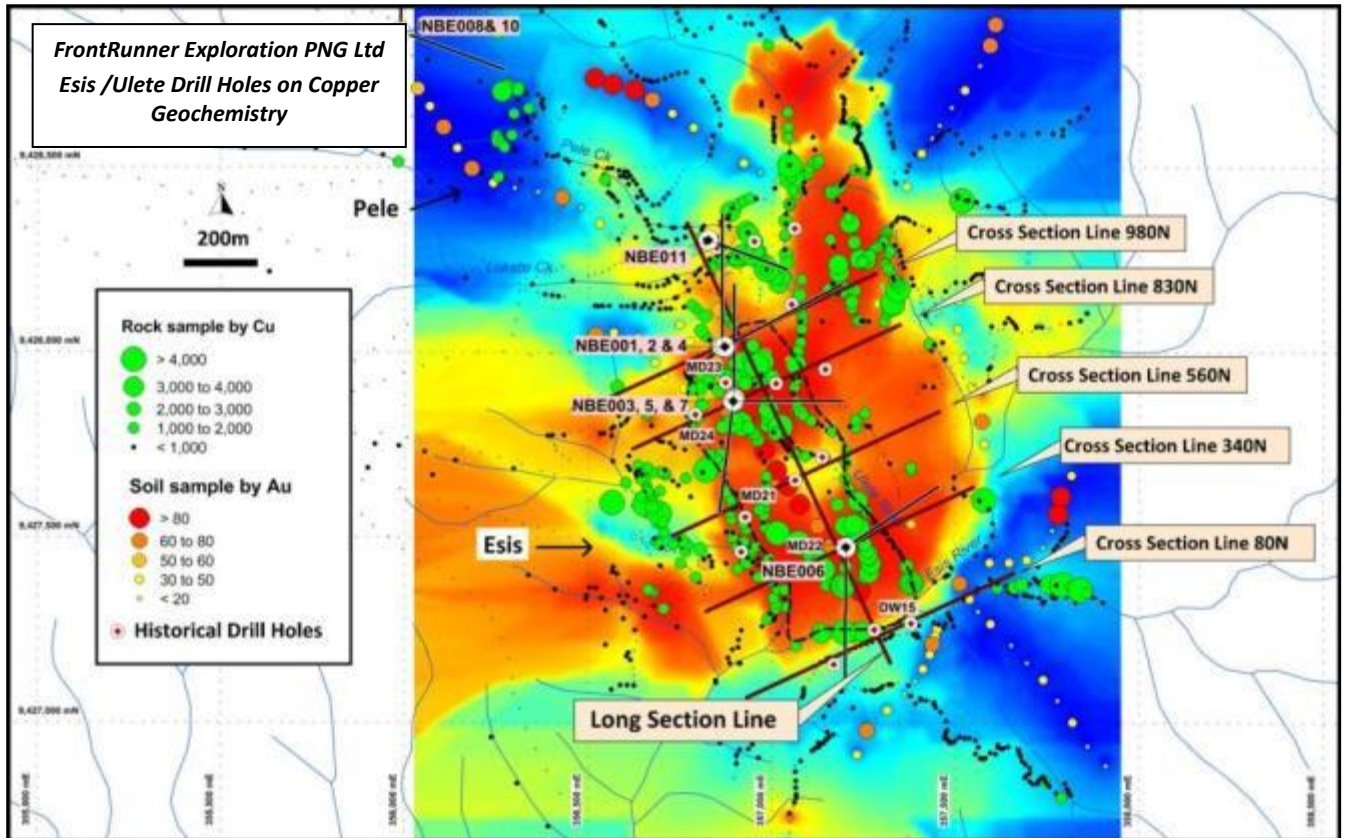
ENE



NB\* the surface trace is not well  
constrained







Assay results from holes NBE001 through NBE015 drilled at the Esis porphyry copper Prospect, ELA 2513 - Kol Mountains by the Ok Tedi Mining Ltd (OTML) - Frontier Resources Ltd Joint Venture on former EL 1351 are detailed below.

The long section shows that the mineralisation in the upper zone is relatively contiguous near surface between all the holes drilled to date. Various cross sections showing the downhole mineralisation. Drill hole locations at Esis/Ulete are also plotted on surface copper geochemistry, with lines showing the location of the long and cross sections. A Google Earth image shows the location of the various drill holes on an oblique image looking northerly (NNE).

The intercepts of significance are defined herein by a 0.15% copper cut-off, with higher grade zones generally defined by a 0.3% copper cut-off. The results for each hole contain no particularly significant gold mineralisation and as such



it is not reported here. The molybdenum is reported so its variation can be noted in context of genetic porphyry copper models, not because it has any particular possible economic value at Esis.

The JV diamond drill holes in varying orientations have achieved a better understanding of the geology with respect to lithology, mineralisation and alteration and will lead to the initial production of a coherent 3D model.

The long section displaying copper in the drill holes demonstrates the consistency of mineralisation between holes and the open nature of the anomaly to the east, south and at depth.

There appears to be at least 3 zones of moderate grade copper mineralisation that are separated by lower grade copper intervals both horizontally and vertically (as seen in the long section and cross sections).

**Hole NBE 001:** Was designed as a vertical twin of MD23, drilled by BHP in 1974. MD23 reported an average of 0.39% copper from surface to its final depth at 152.6m. Mineralisation in NBE001 occurs from the surface in highly fractured, and oxidised, clay altered diorite down to about 230m and into competent quartz diorite which continued to end of hole at 697.6m. It occurs as chalcopyrite disseminations in a stockwork of micro fractures and as disseminated chalcopyrite and minor molybdenum in association with silica alteration. The latter is hosted in steeply dipping quartz feldspar porphyry dykes.

An intercept of 228m grading 0.37% from 0m to 228m. The hole was terminated in 0.41% copper mineralisation. Potassic alteration, characterised by magnetite and biotite increased with depth.

**Hole NBE 002:** Was designed to extend geological knowledge to the north of NBE001 and it was continued to depth on the basis that NBE001 terminated in strong mineralisation at the depth limits of the drill rig. Lithologies consists of fractured clay altered diorite from surface to approximately 189m, grading into a competent quartz-diorite cross cut by steeply dipping quartz veins (to 641.9m). A 20m late volcanic breccia dyke cross cuts the quartz veined diorite units and then continues to the end of hole.

Hole NBE002 contains two discrete individual intercepts for a 184m intercept grading 0.30% copper (from 2m to 186m downhole). The hole was successful in defining a northern limit to mineralisation and identifying new bounding geological units and controls on mineralisation at depth.

Chalcopyrite is hosted in stock work and micro fractures as observed in NBE001. Biotite and magnetite increased with depth similar to NBE001.

**Hole NBE 003:** Was designed to cut across NBE001 (crossed at 307m down-hole depth in NBE001), and continued to be drilled to depth for geology and define the northerly extension of the lower mineralised zone of NBE001. It was drilled from the same pad as NBE005 and NBE007. The geology is consistent down hole with NBE001 & 002 (with the exception of a zone of quartz porphyry in the top of the hole that may extend east).

Lithology consists of fractured clay altered diorite (considered an oxidised cap) from surface to approximately 199m

Drill Hole NBE001 Weighted Assay Results					
From (m)		To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole	0.0	697.6	110.6	0.17	15
0		66.1	66.1	0.27	17
Plus	66.1	228.0	161.9	0.41	57
Plus	228.0	350.0	122.0	0.18	18
Plus	350.0	477.0	127.0	0.26	11
Plus	477.0	537.0	60.0	0.18	7
Plus	537.0	571.0	34.0	0.34	3
Plus	571.0	697.6	126.6	0.16	14
Drill Hole NBE002 Weighted Assay Results					
From (m)		To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole	0.0	716.9	716.90	0.13	14
2.0		186.0	184.0	0.30	19
Incl.	30.1	38.1	8.0	0.40	7
Plus	48.1	54.1	6.0	0.67	3
Plus	74.1	83.6	9.5	0.57	7
Plus	97.6	107.6	10.0	0.37	5
Drill Hole NBE003 Weighted Assay Results					
From (m)		To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole	0.0	606.8	606.8	0.18	25
0.0		239.0	239.0	0.27	35
Plus	239.0	283.0	44.0	0.11	18
Plus	283.0	299.0	16.0	0.22	46
Plus	299.0	329.0	30.0	0.11	37
Plus	329.0	421.0	92.0	0.17	15
Plus	421.0	553.0	132.0	0.07	12
Plus	553.0	599.0	46.0	0.12	23
Plus	599.0	606.8	7.8	0.05	15

passing through a zone of quartz porphyry (115m to 161m) and into a fine grained mafic diorite, ending short of the quartz diorite found at the end of holes NBE001 /002.

There are two mineralised zones, separated by 10m of internal dilution which together produce a weighted average copper mineralisation intercept at 0.27% copper from 0m to 239m down hole at 0.15% cut-off. Consistent with NBE001, chalcopyrite is hosted in stockwork and micro fractures. However, unlike NBE001, no significant quartz-feldspar porphyry dykes were intercepted below 184m.

**Hole NBE 004:** Was designed to test the eastern extension of copper mineralisation intersected in NBE001 and NBE002. Lithologies down hole consist predominantly of variably altered diorite (within oxidised cap to 131.6m) alternating with quartz diorite at depth, which then continues to the end of hole.

Mineralisation is typically chalcopyrite occurring as disseminations in quartz stockwork as well as coating and infilling micro fractures. Discrete zones of mineralisation occur within the upper part, with two zones averaging at 111.5m grading 0.27% copper and 146.6m grading 0.25% copper occurring at 4m and 131.6m respectively.

Copper mineralisation is open to the east and at depth with the hole terminated in 0.38% copper (at the limit of the rig's capacity).

Down hole, the geology is consistent with NBE001 & 2 with the exception of a zone of quartz porphyry zone in the top of the hole that is similar to NBE003. The hole comes into quartz diorite much earlier than found in NBE001 & 2, delineating variation in geology to the north-east.

**Hole NBE 005:** Was drilled to test the eastern extent of anomalism from a southern location on the same pad as NBE003 and NBE007. Down hole, the geology is consistent with NBE001 & 2 being predominantly variably altered diorite. Several zones of mineralisation are present with the main one occurring from 18 – 324.8m averaging at 0.28% copper.

Three other intercepts occur below 306.8m, one being 48m grading 0.20 % copper from 424m down hole.

NBE005 confirmed that the copper anomalism remains open to the east and at depth with the hole producing an intercept of 0.23 % copper over 3.5m from 590m down hole to end of hole.

Although the quartz stockwork appears to be largely unmineralised, it is inferred that a number of phases of quartz veining may be present of which one may be mineralised. Mineralisation appears to be overprinted by phyllic alteration, which in turn, is overprinted by a late stage anhydrite- carbonate-clay-pyrite event.

Being mostly diorite, however, it failed to reach the quartz diorite or pass through the zone of quartz porphyry. The hole stopped early due to drilling conditions.

Drill Hole NBE004 Weighted Assay Results				
From (m)	To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole 0.0	719.9	719.9	0.17	25
0.0	4.0	4.0	0.02	21
Plus 4.0	38.0	34.0	0.24	9
Plus 38.0	48.1	10.1	0.09	17
Plus 48.1	115.5	67.4	0.32	53
Plus 115.5	131.6	16.1	0.06	70
Plus 131.6	278.2	146.6	0.25	63
Plus 278.2	301.0	22.8	0.09	32
Plus 301.0	395.0	94.0	0.20	23
Plus 395.0	453.0	58.0	0.12	2
Plus 453.0	503.0	50.0	0.07	1
Plus 503.0	561.0	58.0	0.10	2
Plus 561.0	669.0	108.0	0.07	2
Plus 669.0	719.9	50.9	0.19	5
Incl. 691.0	709.0	18.0	0.30	6
Drill Hole NBE005 Weighted Assay Results				
From (m)	To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole 0.0	593.5	593.5	0.21	23
0.0	18.0	18.0	0.14	11
Plus 18.0	324.8	306.8	0.28	30
Incl. 36	50	14	0.49	5
Plus 324.8	424.0	99.2	0.12	11
Plus 424.0	472.0	48.0	0.20	23
Plus 472.0	510.0	38.0	0.09	11
Plus 510.0	524.0	14.0	0.20	20
Plus 524.0	540.0	16.0	0.09	28
Plus 540.0	580.0	40.0	0.18	16
Plus 580.0	590.0	10.0	0.12	19
Plus 590.0	593.5	3.5	0.23	4



**Hole NBE 006:** Was designed to follow up on results from historic hole MD22 that was terminated in 0.27% copper at 152.4m depth vertically.

Hole NBE006 was a scissor drill hole from the historic MD22 pad targeted to investigate the possible extension of the mineralisation to the east, as inferred from historic surface geochemical anomalies coupled with observations made from recent results from drill holes NBE001 and NBE002.

Hole NBE006 is at the lowest RL point of the system in the project drilled to date and notably molybdenum content is increasing.

The collar is located in the southeast and the consistent upper large copper intercepts (the first 200m+ in the holes) deliver an apparent continuous mineralisation length of 630m as by collar distance, and a length of ~760m at ~200m depth in the holes (as defined between NBE002 and NBE006). This is still open to the south and north, and perpendicularly to the East and West plus at depth.

Coring started from an oxidised, brecciated zone with dominant magnetite-pyrite-chalcopyrite in matrix that extends 50 metres from the surface. Minor barren andesitic to diorite dykes and sills cut through the extensive intrusive breccia zone locally. The dykes post-date mineralisation and locally destroy or degrade existing hydrothermal alteration and mineralisation.

The intrusive breccia zone consists of mineralised and unmineralised clasts of various composition and sizes. Quartz feldspar diorite, with associated porphyry clasts, is dominant with minor fine grained diorite and andesite. Mineralisation in the breccia is erratic and presumed to be associated with magnetite, as clasts and disseminations at lower levels are encouraging for continuing exploration.

Down hole, the geology is consistent with the other holes drilled at Esis. With the top of the hole being diorite passing into quartz porphyry into quartz diorite back into diorite, there are some minor un-mineralised crosscutting dykes present. The hole terminated 100m early due to drilling conditions. Copper mineralisation in the main intercept is in fractured clay altered diorite and intrusive breccias with varying amounts of magnetite, quartz, chalcopyrite and various alteration types.

Multiple mineralised zones are present; the upper part of the hole is defined by one zone, 232.5m grading 0.27% copper (from 3.5m). Below this main intercept there is a broad continuous zone of weaker mineralisation from 308m to EOH (averaging 0.15 % copper) and contains nine intercepts > 0.2 % copper.

**Hole NBE 007:** Was drilled on the same pad as NBE003 and NBE005 and was designed to test the historically identified quartz porphyry and encouraging surface grades to the south. Mineralisation occurs in multiple zones. This is the first hole with a moderate variation from the upper 200m strong mineralised zone as reported in holes NBE001 to NBE006. The variation consists of 4 discrete upper intercepts in the top 200m (contained within a 0.19 % copper broad weaker anomaly from surface to 236m). Also, present is a broad zone from 436m (averaging 0.21% copper) to EOH, that contains multiple discrete intercepts. The hole terminated 100m early due to drilling conditions.

The core is strongly weathered to 112m passing into fresh diorite with discrete zones of quartz porphyry and quartz diorite. Breccias – stock-work occurs in multiple instances and copper mineralization generally consists of chalcopyrite ± trace bornite from near surface; minor-trace molybdenite from 112m. Pyrrhotite is recorded as the dominant mineral from 555m. There are multiple small un-mineralised crosscutting dykes. Alteration is typically clay at surface passing to potassium feldspar with increasing biotite. Gypsum/anhydrite alteration is strong between 238 to 433m.

Drill Hole NBE006 Weighted Assay Results					
	From (m)	To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole	0.0	598.3	598.3	0.19	25
	3.5	236.0	232.5	0.27	21
Incl.	16.0	38.0	22.0	0.35	19
and	86.0	150.0	64.0	0.34	21
Plus	236.0	308.0	72.0	0.07	15
Plus	308.0	528.0	220.0	0.14	25
incl.	356.0	396.0	40.0	0.19	24
Incl.	396.0	446.0	16.0	0.23	49
Plus	528.0	598.3	70.3	0.17	50
Incl.	581.0	592.0	11.0	0.24	117

Drill Hole NBE007 Weighted Assay Results					
From (m)		To (m)	Intercept (m)	Copper (%)	Moly (ppm)
Entire Hole	0.0	602.7	602.7	0.17	11
	0	138	138	0.23	13
Incl.	0.0	12.0	12.0	0.43	8
Plus	12.0	40.4	28.4	0.17	16
Plus	40.4	52.0	11.6	0.41	14
Plus	52.0	116.0	64.0	0.18	15
Plus	116.0	138.0	22.0	0.24	8
	138.0	224.0	86.0	0.14	8
	224.0	320.0	96.0	0.10	4
	320.0	436.0	116.0	0.16	12
	436.0	602.7	166.7	0.21	15

From 524m strong quartz stock-working is pervasive.

**Hole NBE 008:** Was a Phase 2 hole drilled to 602.6m to target known copper mineralisation in the Pele area. Hole NBE009 delivers multiple mineralised intercepts, the most notable being an extensive 576.6m grading 0.25% copper (0.1% cut-off) from 2.4m to 579m down hole. This long intercept contains higher grade zones of significance such as 14m grading 0.57% copper (from 21m), 18m grading 0.47% copper (from 107m) and 10m of 0.41% copper (from 349m). Refer to Table 1 for NBE009 weighted assay averages and Table 4 for all other results to date.

NBE009 was drilled on the same Pad as NBE006 and was designed to test southern extension of the mineralization. Weathering is predominant to 45m and copper mineralisation occurs in micro-fractures and fine disseminations. Gold is slightly elevated but is still considered insignificant with respect to a possible economic contribution. The assay results demonstrate the copper mineralisation is still open to the south.

**Hole NBE 009:** Was drilled to 700.2m on the same pad as NBE006, a Phase 1 hole targeting the southern extension to Esis.

**Hole NBE 010:** Was a Phase 2 drilled to 307.0m on the same pad as NBE008, to target copper mineralisation in the Pele area.

**Hole NBE 011:** Was abandoned at 55.4m due to drilling issues. It is a Phase 1 hole targeting the northern extension to Esis.

**Hole NBE 012:** Was a phase 1 infill hole that was terminated at 400.0m.

**NBE 013:** Was drilled at the north end of Esis, was orientated to the east-south-east and designed to test the northern extension of the mineralisation as observed in surface samples. The top of hole in the margins of the main anomaly as defined by drilling to date is coincident with the relatively non-mineralised core in the lower part of NBE002:

The mineralisation at depth in NBE013 indicates the system is still open to the East. The hole was shortened from the original planned depth based on geology being intercepted. Mineralisation is weaker compared to other holes drilled at Esis due to the host rock being a volcanic unit that is less permeable.

Weathering is predominant to ~34m. The lithology is typically fine grained strongly magnetic amygdaloidal andesite possibly of the Baining Volcanics. The alteration passes from clay/ chlorite into propylitic/phyllic, there is overprinting hornfelsed alteration with localised veins of pyrite and quartz sometimes with carbonate; from 290m strong anhydrite is noted. A series of 4 faults are noted in the andesite, from 289m.

**NBE014:** Was drilled to the west of NBE003, 5 & 7. Was designed to test the western extension of the anomaly, strong mineralisation was expected to be intercepted from below 250m, inferred from mineralized outcrop in a creek.

Severe drilling problems resulted in early termination; subsequently it only penetrated the Baining Volcanic unit from surface and failed to reach the predicted zone at depth. The weaker mineralisation in the volcanic unit is considered to be a result of the relatively impermeable nature of the host unit.

The core is strongly fractured fine-grained amygdaloidal andesite of the Baining Volcanics unit. Alteration varies from chloritic to phyllic/ propylitic with hornfelsed (Quartz, biotite, carbonate) overprinting from 40m increasing in intensity

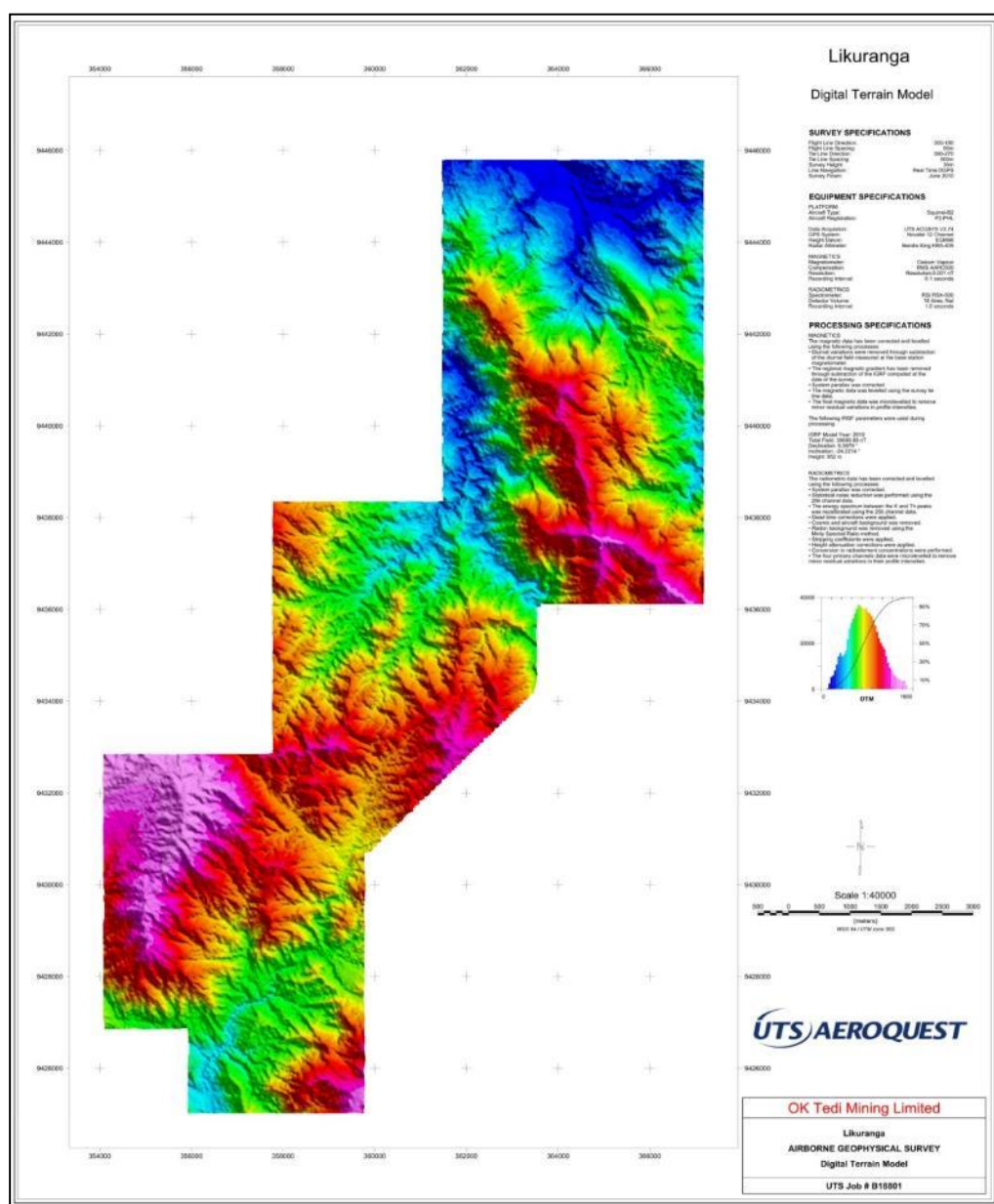
Drill Hole NBE009 Weighted Assay Results					
Intercept	Length	Copper Average	From (m)	To (m)	Cutoff Grade
Longest =	576.6m	0.25%	2.4	579.0	0.1%
Incl.	274m	0.30%	7.0	281.0	0.2%
plus	72m	0.28%	315.0	387.0	0.2%
Incl.	14m	0.57%	21.0	35.0	0.4%
and	4m	0.43%	95.0	99.0	0.4%
and	18m	0.47%	107.0	125.0	0.4%
Incl.	10m	0.41%	349.0	359.0	0.4%
and	28m	0.21%	419.0	447.0	0.2%
and	4m	0.29%	463.0	467.0	0.2%
Hole ID	From (m)	to (m)	Length (m)	Assay	Cutoff %
NBE013	31.7	42.0	10.3	0.15	0.1
	58.0	76.0	18.0	0.14	0.1
	196.0	324.3	128.3	0.16	0.1
	224.0	234.0	10.0	0.21	0.2
	258.0	280.0	22.0	0.21	0.2
	292.0	308.0	16.0	0.21	0.2
	316.0	320.0	4.0	0.27	0.2
whole hole average			324.3	0.10	NA
NBE014	37.4	40.4	3.0	0.57	0.4
	56.0	75.4	19.4	0.12	0.1
	84.0	190.0	106.0	0.12	0.1
	226.0	230.0	4.0	0.14	0.1
whole hole average			255.0	0.09	NA
NBE015	7.0	234.0	227.0	0.15	0.1
	11.0	40.0	29.0	0.21	0.2
	126.0	134.0	8.0	0.21	0.2
	196.0	200.0	4.0	0.25	0.2
	246.0	252.0	6.0	0.11	0.1
	264.0	402.2	138.2	0.16	0.1
	266.0	306.0	40.0	0.23	0.2
also	370.0	390.0	20.0	0.21	0.2
whole hole average			402.2	0.15	NA



**NBE015:** Is one of two holes designed to test the mineralisation anomaly continuity between drill-holes NBE005, 6 and 7, located near historic short vertical drill hole MD2, it was orientated to the north. At 283m down hole it passes within 106m of NBE007, and mineralisation value are comparable between the two holes at this depth. The mineralisation is slightly weaker in the upper (plus) 200m, when compared to the NBE007. The results are considered encouraging, and the hole further develops the geological model.

The core is strongly weathered to 28.6m, and consisting of andesite to ~334m, passing to quartz porphyry dyke and passes into diorite, at 380m an aphanitic andesite (probably Baining Volcanics) is encountered. Mineralisation is dominantly pyrite-chalcopyrite and occurs as veins and along fractures in the volcanic rocks, whilst it tends to occur as disseminations within chloritised, hornfelsed and phyllic altered matrices of mineralised siliceous breccias. Alteration is dominantly phyllic, characterised by quartz-sericite-chlorite. A hornfels alteration overprint with increasing intensity with depth is noted from 134m.

## AEROMAGNETIC DATA AND MODELLING





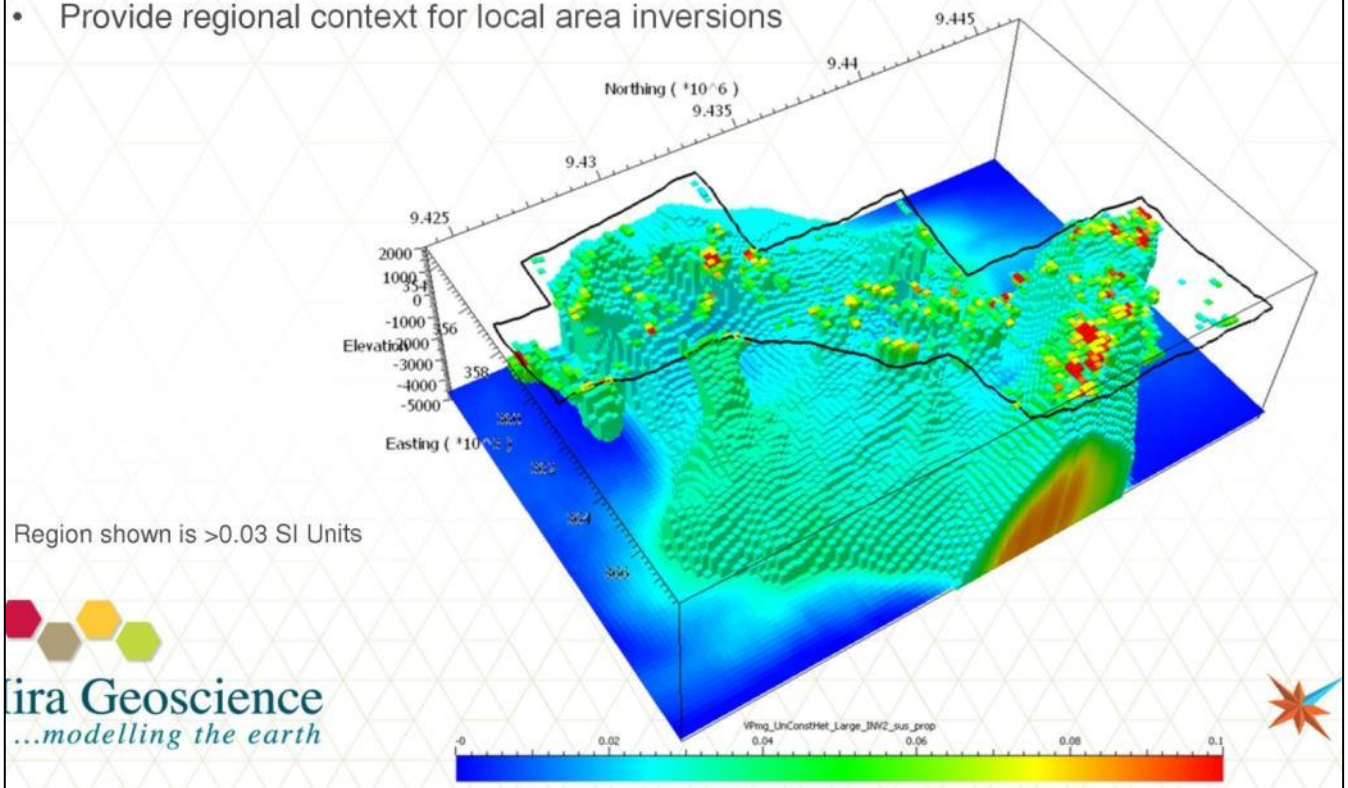




# Regional 3D Heterogeneous Inversion

## 200mx200mx50m Unconstrained Regional Inversion

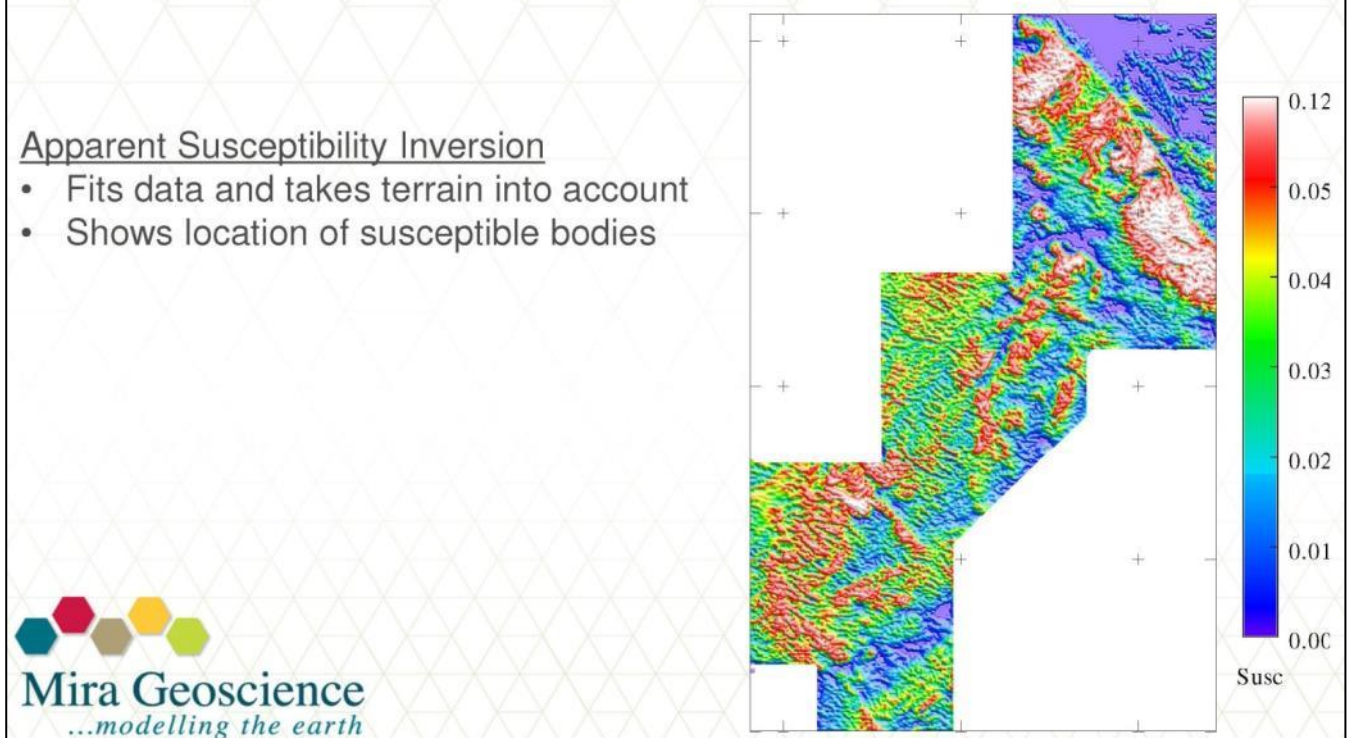
- 6km depth
- Establish regional trends and character of major susceptible features
- Provide regional context for local area inversions



## Initial Regional Scale Interpretation

### Apparent Susceptibility Inversion

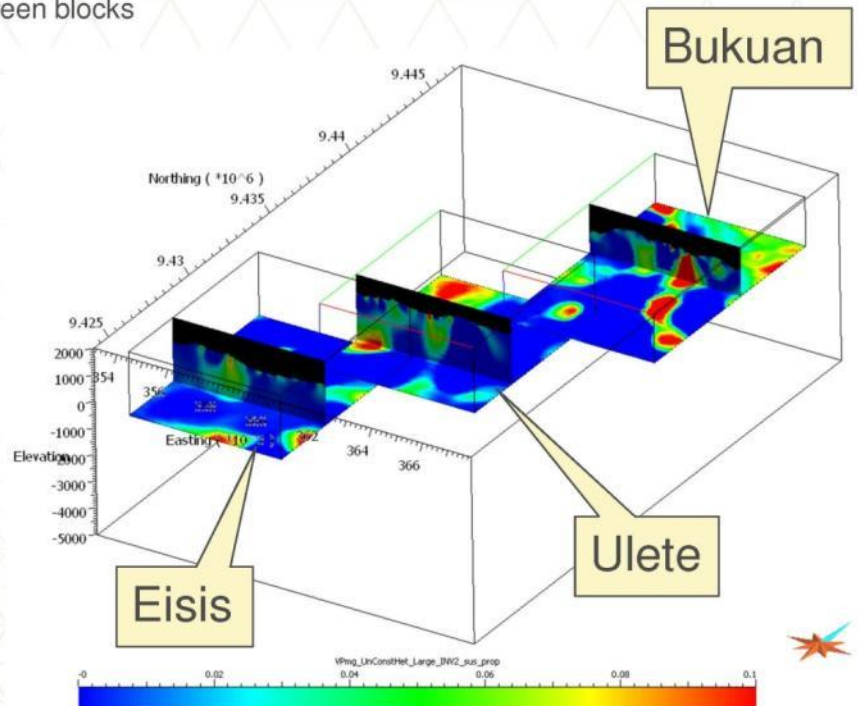
- Fits data and takes terrain into account
- Shows location of susceptible bodies





## Local Unconstrained Inversions

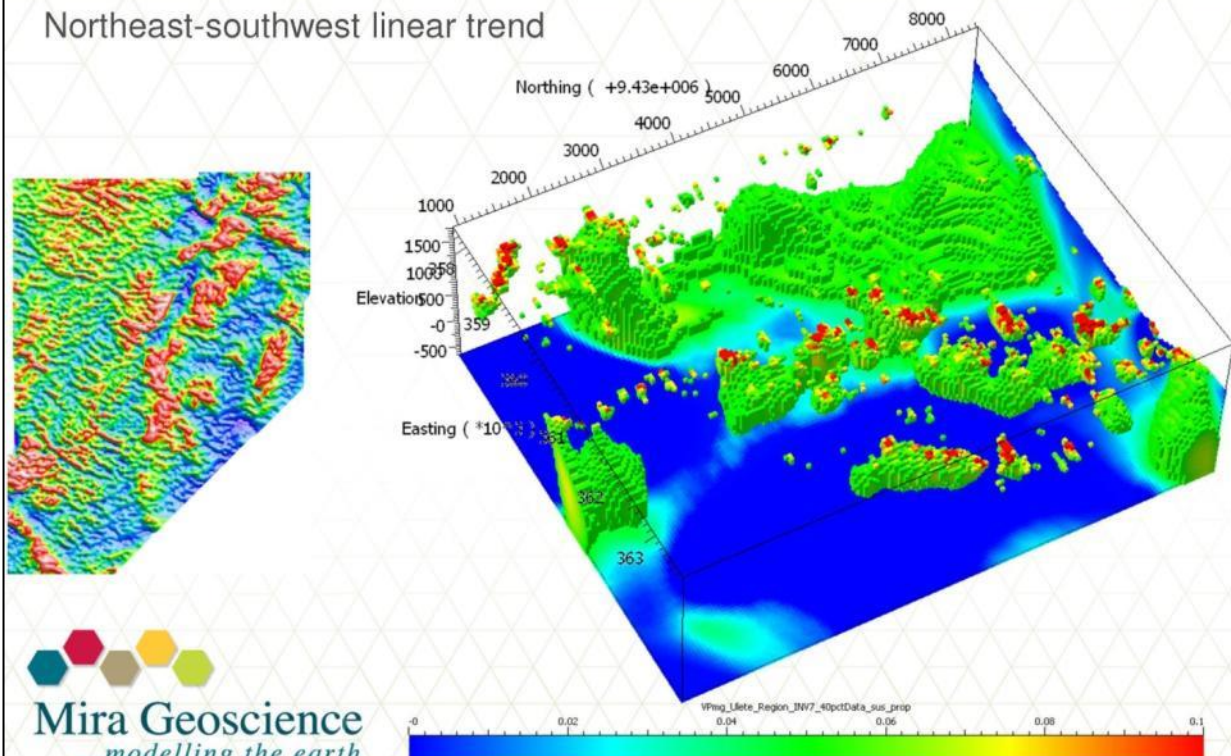
- 3 local target regions created for 50m resolution unconstrained heterogeneous inversions
- Each inversion run incised into the regional apparent susceptibility model
  - Account for regional field variations
  - Maintain consistency between blocks



## Ulete Target Area

50m Resolution Unconstrained Local Inversion

Northeast-southwest linear trend





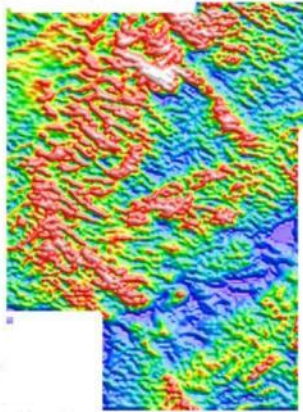
# Eisis Target Area

## 50m Resolution Unconstrained Local Inversion

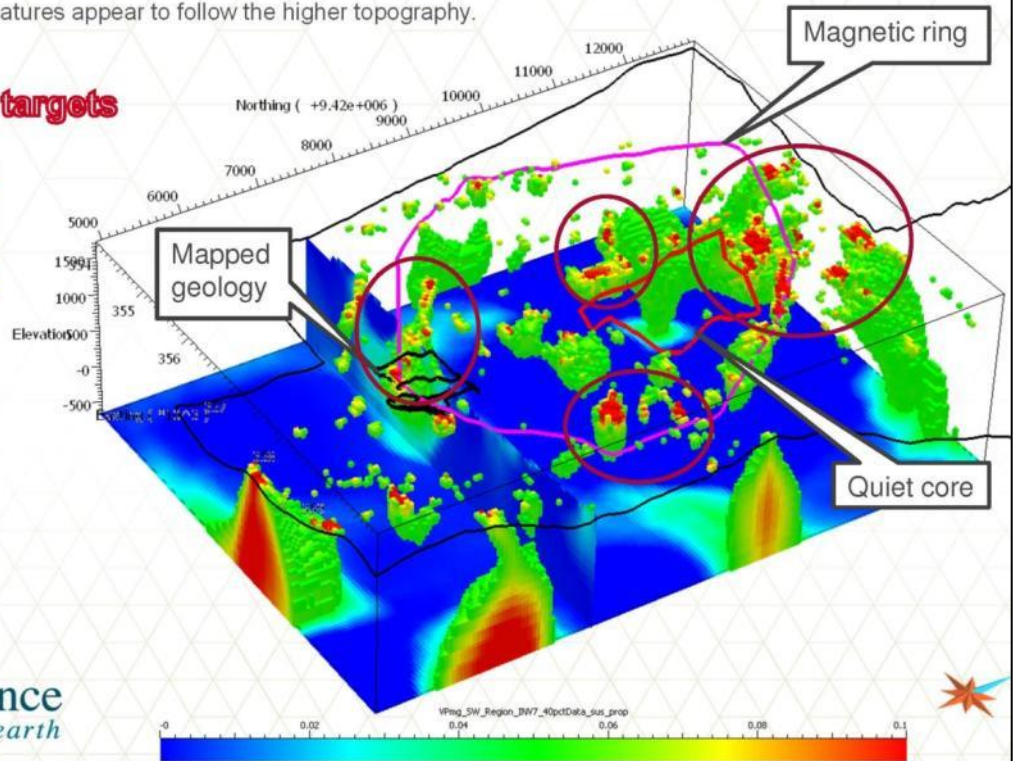
Characterised by a large circular magnetic feature with a magnetically quiet center which may show alteration zone within the porphyry.

The higher magnetic features appear to follow the higher topography.

### Potential skarn targets



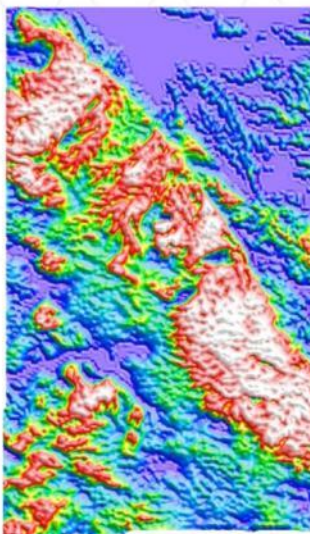
**Mira Geoscience**  
...modelling the earth



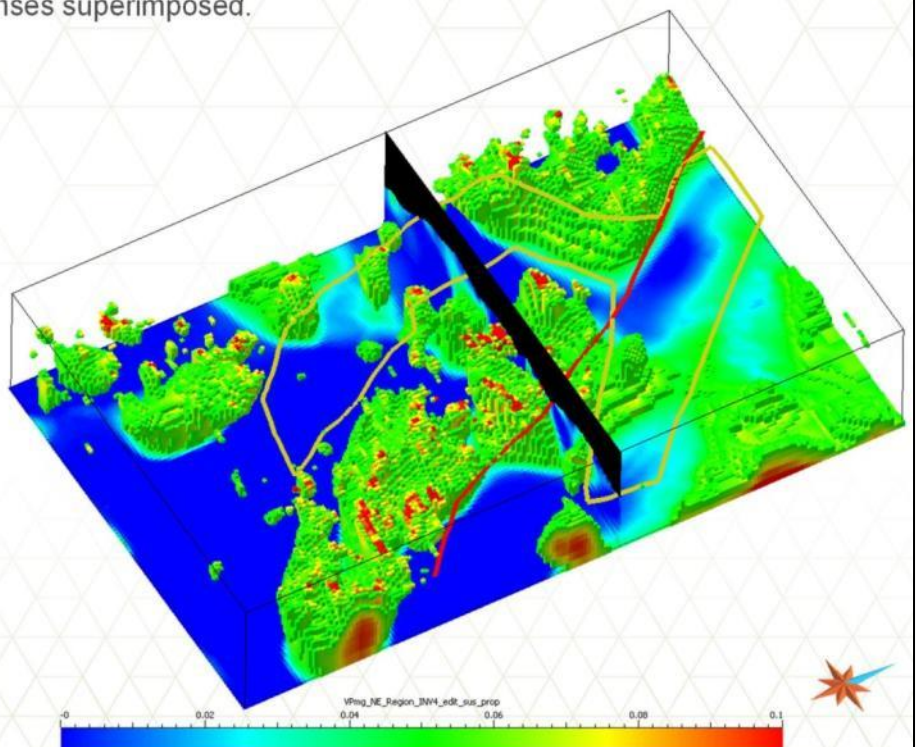
# Bukuan Target Area

## 50m Resolution Unconstrained Local Inversion

- Magnetically most complex, with a very obvious deeper (longer wavelength) signature running SE-NW, local responses superimposed.



**Mira Geoscience**  
...modelling the earth



Region shown is > 0.05 SI units



## CORPORATE

The Rights Issue announced on 12 April 2017 closed on Thursday, 18<sup>th</sup> May 2017, with 106 applications for 626,964 shares totalling \$28,213.38. The Rights Issue offered eligible shareholders registered on the Record Date the ability to subscribe for New Shares on the basis of one (1) fully paid ordinary share for every three (3) held at an issue price of \$0.045 per New Share. The New Shares were allotted on the 25<sup>th</sup> of May 2017.

Professional consultants and contractors to the Company agreed to settle future 2017 fees totalling \$280,000 in shares at conversion price of \$0.045 per share (Conversion). Frontier has no existing debt with these consultants /contractors and the Conversion represents approximately six months of professional fees for future services in Papua New Guinea (PNG) and Australia. The Directors note that the Conversion is an efficient way of enabling exploration to be undertaken in PNG and are very encouraged that these parties are pleased to participate in the Company's future in this manner. This Conversion will provide the Company the flexibility to save a substantial amount of budgeted expenditure from future exploration programs.

### Releases Submitted to The ASX During the Quarter Included:

19th July 2017	Andewa EL 'Gifted' 100% to Frontier and Strategy for the Second Half of 2017
10th July 2017	Good Reconnaissance Gold Exploration Results
7th July 2017	EL 1595 Bulago - Drill Hole Assay Results
9th June 2017	Stoneleigh Regional Reconnaissance Exploration Planned
30th May 2017	Bulago Porphyry Copper - Gold Hole GCZ002 Drilling Information
27th May 2017	Issue of Shares in Lieu of Fees Totalling \$280,000
23rd May 2017	Close of Rights Issue Off and Notice of Shortfall
22nd May 2017	ELA 2513 Kol Mountains - Information Summary
19th May 2017	Option Agreement Signed to Purchase FrontRunner Exploration PNG Ltd, Ala River EL and Kol Mountains ELA, West/East New Britain Provinces, PNG
10th May 2017	EL 1595 - Bulago Renewed
8th May 2017	Tolukuma EL 2531 Application Registered with PNG Mineral Resource Authority
4th May 2017	Gazelle EL Application 2529 Lodged (Again) with MRA
2nd May 2017	ELA 2515 - Gazelle Refused Grant
3rd May 2017	Update on Porphyry Copper - Gold Drilling at Bulago
28th April 2017	Option Agreement Signed for Joint Venture on Andewa EL
12 <sup>th</sup> April 2017	Rights Issue Prospectus Issued to Raise Capital for Exploration at the Gazelle ELA (Former Sinivit Gold Mine)

For additional information please visit our website at [www.frontierresources.com.au](http://www.frontierresources.com.au)

## FRONTIER RESOURCES LTD



P.A. McNeil, M.Sc., MAIG  
Chairman and Managing Director

### Competent Person Statement:

The information in this report that relates to Exploration Results and Mineral Resources is based on information compiled by, or compiled under the supervision of Peter A. McNeil - Member of the Aust. Inst. of Geoscientists. Peter McNeil is the Managing Director of Frontier Resources, who consults to the Company. Peter McNeil has sufficient experience which is relevant to the type of mineralisation and type of deposit under consideration to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code of Reporting Exploration Results, Mineral Resources and Ore Resources. Peter McNeil consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

Frontier Resources Ltd Exploration Licence Information						
Licence Name	Number	Date From	Date To	Ownership	Area (SQ KM)	Lat. Sub Blocks
Bulago	EL 1595	7/07/2016	6/7/2018	100% Frontier Gold PNG Ltd	73	22
Muller	EL 2356	31/12/2015	30/12/2017	100% Frontier Copper PNG Ltd	187	56
Andewa	EL 2461	15/11/2016	14/11/2018	100% ** WNB Resources Ltd	147	44
Ala	EL 2375	14/12/2015	13/12/2017	100% *FrontRunner Exploration PNG	143	43
<b>Total Granted ELs</b>					<b>550</b>	<b>SQ KM</b>
Sewatupwa	ELA 2476	Application		100% *Frontier Copper PNG Ltd	436	131
Lavu	ELA 2477	Application		100% *Frontier Copper PNG Ltd	839	252
Gazelle	ELA 2529	Application		100% *Frontier Copper PNG Ltd	703	211
Tolukuma	ELA 2531	Application		100% *Frontier Copper PNG Ltd	433	130
Kol	ELA 2513	Application		100% *Frontier Copper PNG Ltd	123	37
<small>           NB: * Subject to 3% royalty to P. McNeil (to be approved by shareholders) ** To be Transferred to Frontier Copper PNG Ltd            The PNG Mining Act-1992 stipulates that ELs are granted for renewable 2 year Terms (subject to Work and Financial Commitments) and the PNG Government maintains the right to purchase up to 30% project equity at "Sunk Cost" if/when a Mining Lease is granted.         </small>						

JORC CODE 2012			
Section 1 – Sampling Techniques and Data			
Criteria		Explanation	Commentary
<b>Sampling techniques</b>	o	Nature and quality of sampling	FDH002 and 003 cores was drilled HQTT (triple tube) by a CSD500 rig and removed from the inner tube into core trays. The whole core was diamond saw cut to half core that was put into calico bags for analysis. Same for GCZ001. GZC002 was drilled HQ and it reduced to NQTT at 105.80m.
	o	Measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Supervised by Senior Geologist, marked up for sampling taking structural orientations into account and attempting to bisect them.
	o	Aspects of the determination of mineralisation that are Material to the Public Report.	Material aspects of the mineralisation are noted in the text.
<b>Drilling techniques</b>	o	Drill type and whether core is oriented.	The HQ triple tube core drilling was un-oriented and not surveyed as the holes were all shallow and deviation would have been very minor.
<b>Drill sample recovery</b>	o	Method of recording and assessing core recoveries and results assessed	Linear arithmetic, good recoveries.
	o	Measures taken to maximise sample recovery and ensure representative nature of the samples.	The remaining core was then geologically logged in detail. Downhole sample recovery was maximised by the drillers utilising appropriate downhole consumables at the appropriate times to 'consolidate' or hold the rock together combined with the fact that we utilise our own rig and drillers who are not paid meterage (speed) bonuses and are therefore more careful with core recovery than normal commercial drillers working on meterage bonuses. Supervised by Senior Geologist with sampling normally on a 1m or 2m basis, but lithologically, also depending on the site geologist's estimate of the intervals' mineralisation potential.
	o	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred.	No relationship exists between sample recovery and grade. Recovery was good. No sample bias has occurred due to preferential loss/gain of core or fine/coarse material.
<b>Logging</b>	o	Whether core samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	Core samples were geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.
	o	Whether logging is qualitative or quantitative in nature and photography.	Core logging is qualitative in nature, the core was photographed, measured for recovery, rough logged and marked up for sampling.
	o	The total length and percentage of the relevant intersections logged	All core was logged, but not necessarily all sampled.
<b>Sub-sampling techniques and sample preparation</b>	o	If core, whether cut or sawn and whether quarter, half or all core taken.	HQ core was diamond blade sawn to quarter core and sampled. NQ core was cut to half core and sampled. The other ¼ or ½ core remained in the core tray on site.
	o	The nature, quality and appropriateness of the sample preparation technique.	Quarter and half core diamond blade cut core sampling is high quality and an appropriate technique for all precious and base metal targets/deposits.
	o	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Standard laboratory procedures practised by ISO certified labs
	o	Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate /second-half sampling.	Supervised by Senior Geologist and second half sampling is sometimes undertaken, but not herein due to the small number of samples.
	o	Whether sample sizes are appropriate to the grain size of the material being sampled.	Half or quarter core is an appropriate sample size for this type of investigation, relative to the core diameter.
<b>Quality of assay data and laboratory tests</b>	o	<p>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</p> <p>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</p>	<p>The procedure undertaken were appropriate. Half diamond blade cut drill core was 50 gm fire assayed for gold +40 element ICP with near total 4 acid digestion Acceptable accuracy and precision levels were established and reported by the lab.</p> <p>Analysis was undertaken by SGS Australia – Townsville, Australia.</p> <p>Sample Preparation -Core PRP88: Dry, crush 6 mm, Pulverize, 75µm, &lt;3.0kg.</p> <p>Gold by fire assay Code: FAA505: The gold is determined by fire assay by using lead collection technique with a 50-gram sample charge weight. Detection limits: Au 0.01– 10000 ppm</p> <p>Base metals by 4 acid ICP-OES finish Code: DIG40Q Total Geochem Digest: The sample is digested with nitric, hydrochloric, hydrofluoric and perchloric acids to effect as near to total solubility of the sample as possible.</p> <p>The solution from the above DIG40Q digest is presented to an ICP-OES for the quantification of the elements of interest. Code: ICP40Q: Detection limits: Ag 0.5 – 200 ppm, Cu 5 – 10000 ppm, Ni 5 – 10000 ppm, Te 10 – 10000 ppm, Al 100 – 400000 ppm, Fe 100 – 1000000 ppm, P 20 – 100000 ppm, Th 10 – 10000 ppm, As 3 – 10000 ppm, Hf 20 – 10000 ppm, Pb 5 – 5000 ppm, Ti 10 – 20000 ppm, Ba 5 – 10000 ppm, K 100 – 200000 ppm, Rb 5 – 10000 ppm, U 10 – 10000 ppm, Be 0.5 – 5000 ppm, La 0.5 – 10000 ppm, S 20 – 50000 ppm, V 1 – 10000 ppm, Bi 5 – 10000 ppm, Li 1 – 10000 ppm, Sb 2 – 5000 ppm, W 10 – 10000 ppm, Ca 50 – 400000 ppm, Mg 20 – 1000000 ppm, Sc 0.5 – 500 ppm, Y 0.5 – 5000 ppm, Cd 1 – 5000 ppm, Mn 5 – 10000 ppm, Se 10 – 10000 ppm, Zn 5 – 10000 ppm, Ce 10 – 10000 ppm, Mo 5 – 10000 ppm, Sn 2 – 1000 ppm, Zr 1 – 10000 ppm, Co 1 – 10000 ppm, Na 50 – 200000 ppm, Sr 1 – 10000 ppm, Cr 10 – 20000 ppm, Nb 10 – 10000 ppm, Ta 20 – 10000 ppm.</p> <p>If the sample contained more of the element than the method was capable of determining it was re-run using and 'Over-Range' method: 4 acid – ore grade, assay grade method Code: DIG41Q: The sample 0.2g (df=500) is digested with nitric, hydrochloric, hydrofluoric and perchloric acids to effect as near to total solubility of the sample as possible. Code: AAS41Q Description: AAS analysis following a DIG41Q digest.</p>
	o	For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	Not applicable. None used. Improved surveying required for a resource estimation.
<b>Verification of sampling and assaying</b>	o	The verification of significant intersections by either independent or alternative company personnel.	Verified by Senior geologist Fred Iwei and all other geologists onsite at the time.
	o	The use of twinned holes.	Nil per-se, but these were very close to hole SUG002.



	o	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Normal field protocols were utilised whereby physical data was transferred into a laptop generally each day.
	o	Discuss any adjustments to assay data.	No adjustments made to assay data that are not reported in the if more than 1 assay exists, its average is quoted.
<b>Location of data points</b>	o	Accuracy + quality of surveys used to locate drill holes (collar + down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	Hand held GPS at this stage.
	o	Specification of the grid system used.	Map datum is AGD 066.
	o	Quality and adequacy of topographic control.	Topographic control is low with 40m contours from 1:100,000 plans and 10m contours from DTM contours.
<b>Data spacing and distribution</b>	o	Data spacing for reporting of Exploration Results.	As noted in body of text and refer to any attached plans for details.
	o	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied	Hole collar and hence data spacing and distribution is not yet sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedures. Additional drilling is required.
	o	Whether sample compositing has been applied.	Not applied.
<b>Orientation of data in relation to geological structure</b>	o	Whether the orientation of sampling achieves unbiased sampling of possible structures to the extent this is known, considering the deposit type.	Orientation of cut from the diamond blade saw achieves unbiased sampling of possible structures to the extent this is known and determinable, considering the deposit type.
	o	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported.	The relationship between the drilling orientation and the orientation of key mineralised structures is considered to be appropriate as discussed and has not introduced a sampling bias.
<b>Sample security</b>	o	Measures taken to ensure sample security	Sample were transported by the MD in checked baggage from site to Perth.
<b>Audits or reviews</b>	o	Results of any audits or reviews of sampling techniques and data.	No specific audits or reviews of sampling techniques and data have been undertaken.
<b>Section 2 -- Reporting of Exploration Results</b>			
<b>Criteria</b>		<b>Explanation</b>	<b>Commentary</b>
<b>Tenure</b>	o	The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	As noted in body of text.
<b>Exploration done by others</b>	o	Acknowledgment and appraisal of exploration by other parties.	Exploration in the region in the late 1960s was part of a PNG porphyry copper deposit search. It was explored for gold initially in the mid 1980's. Refer previous comprehensive data summaries to the ASX for previous work.
<b>Geology</b>	o	Deposit type, geological setting and style of mineralisation.	Gold intrusive -epithermal related targets, porphyry copper-gold - molybdenum and higher-grade gold -silver-zinc-lead skarns in the Fold belt of Papua New Guinea.
<b>Drill hole information</b>	o	A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:	This drill Information is tabulated in body of text.
		Easting and northing of the drill hole collar	This information tabulated in the text of the release.
		Elevation or RL (Reduced Level- elevation above sea level in metres) of the drill hole collar	Information tabulated in the text.
		Dip and azimuth of the hole	This drill Information is tabulated in body of text.
		Down hole length and interception depth	This information tabulated in the text of the release.
		Hole length	This drill Information is tabulated in body of text.
<b>Data aggregation methods</b>	o	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Tables of results included show data aggregation if applied. Core intercepts are weighted averages of the averaged (when possible or individual otherwise) assay results.
		Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail	If this occurred, it is stated in the text with appropriate cut off grades provided.
	o	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values are reported.
<b>Relationship between mineralisation widths &amp; intercept lengths</b>	o	These relationships are particularly important in the reporting of Exploration Results.	The relationship between mineralisation widths & intercept lengths is moderately well understood.
	o	If the geometry of the mineralisation with respect to drill hole angle is known, its nature should be reported.	If the geometry of the mineralisation with respect to drill hole angle is known, it is reported in body of text.
	o	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	
<b>Diagrams</b>	o	Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	Appropriate maps, sections and tabulations of intercepts are included as possible.
<b>Balanced reporting</b>	o	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	Comprehensive reporting of Exploration Results has been undertaken.
<b>Other substantive exploration data</b>	o	Other exploration data, if meaningful and material should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples - size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances	All meaningful exploration data has been included in this and many previous releases to the ASX.
<b>Further work</b>	o	The nature and scale of planned further work	Future work is dependent on available capital.
	o	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Appropriate plans are included, as possible.

## APPENDIX 1

### BULAGO PORPHYRY COPPER - GOLD HOLE GCZ002 DRILLING INFORMATION

*"The recently received photographs and drill /sample logs demonstrate that multiple, megascopically interesting zones of brecciation, alteration and mineralisation were intersected by the 303.9m long hole and assay results will quantify them in a few weeks.*

*Hole GCZ002 targeted the 350m wide, NNE trending and NW dipping gold (+ copper) mineralised /structural zone that crosses the Bulago Valley. The hole intersected 6 major zones and >10 smaller zones of hydrothermal brecciation/ veining in diorites and mudstones and they appear to be wider /stronger in general with increasing depth.*

*The 69.7m intercept from 234.2m to end of hole (303.9m) appears to be very interesting, being comprised of hydrothermal breccia, siltstone, diorite, hydrothermal breccia, andesite, diorite, mudstone, siltstone /breccia and diorite and it is summarised below.*

*Drill core, rocks and stream sediment samples are en-route to the Laboratory in Townsville for analysis and*



*compiled results should be announced late June."*

#### SUMMARY LOG

234.2-239.26m: 5.06m of hydrothermal breccia, intensely silicified siltstone clasts and strongly altered bleached (white) fine to medium-grained diorite. Very strong pyrite + chalcopyrite occurring ubiquitously as discontinuous veinlets, fine massive clusters in fractures and cavities and disseminated.

239.26-251.4m: 12.14m of siltstone with intense quartz carbonate stockwork veinlets, pyrite-chalcopyrite in cavities with quartz carbonate veinlets.

251.4-253.0m: 1.6m of porphyritic diorite, with fracture fill pyrite + chalcopyrite discontinuous veinlets and clusters. Weak epidote in fractures.





253.0-261.10m: 8.1m of hydrothermal breccia in siltstone and diorite respectively. Pyrite + chalcopyrite not common in siltstone but are common in diorite clasts. Weak-moderate pervasive brown alteration bleached by veinlets of quartz carbonate overprinting.

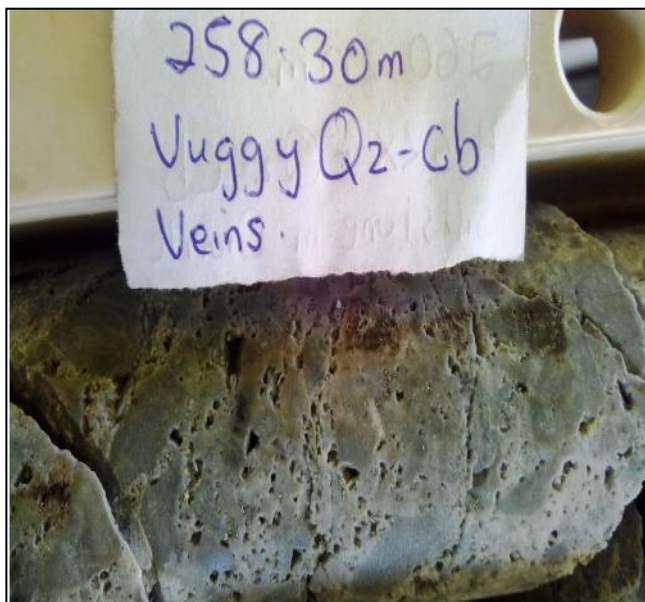
261.1-264.0m: 2.9m of andesite, pervasive chlorite-epidote disseminated pyrite + chalcopyrite intergrown with epidote.

264.0-274.9m: 10.9m diorite, weak to moderately silicified with chlorite-epidote-pyrite + chalcopyrite in fractures and disseminated patches to pervasive in green zones. 264.9-266.9m is 2.0m of quartz carbonate flooding with strong cavities and vugs. From 269.3-270.5m is a bleached dioritic hydrothermal breccia with pyrite + chalcopyrite mostly in fractures and disseminations and clusters.

274.9-281.8m: 6.9m of mudstone/siltstone with strong stockwork of quartz carbonate veinlets, local diorite breccia, from 277.1-278.9m silica flooding with crackle brecciation, strong pyrite + chalcopyrite veinlets-clumps-disseminations-fracture fill.

281.8-299.0m: 17.2m of siltstone, with strong bleaching and quartz carbonate veining, breccia zones are from 1cm to 1m wide.

299.00-303.9m: 4.9m of diorite, strong pyrite + chalcopyrite disseminated and pervasive, plus micro-veinlets of fine pyrite + chalcopyrite, intergrown with magnetite-biotite grains. Quartz veining is weak from 299.0-303.7m. Strong stockwork of quartz carbonate veinlets developing from 303.4-303.9m.



## Geology

0.00-10.60m: Colluvium

Variable sediments on the old river bed of Bulago River. Boulders, cobbles, gravels and sands of mostly fine-medium grained diorite and limestone. Medium grained diorite with strong weathering and weak clay overprinting with moderate pervasive oxidation at 8.4-9.9m.

10.6-14.4m: Quartz Diorite

Strongly weathered pale gray porphyritic diorite. Disintegration/leaching of matrix leaving medium-grained spike like Quartz. Quartz vein (0.5cm) in the centre of the core parallel to the core axis. Pervasive green chlorite sparsely dispersed, black mineral (biotite/magnetite?), Pyrite + chalcopyrite as disseminations, clusters or fracture fill (3%).

14.4-17.4m: Diorite

Fine-grained felsic with strong silicification and strong pervasive brown alteration overprinting. Minor (1%) pyrite + chalcopyrite, quartz crystals and minor veinlets. A 0.3m strongly weathered zone with clay overprinting at 17.1-17.4m. Quartz crystals and veinlets with weak sulphides (pyrite-cpy) development. Very strong brown alteration overprinting.

17.4-19.3m: Quartz Diorite

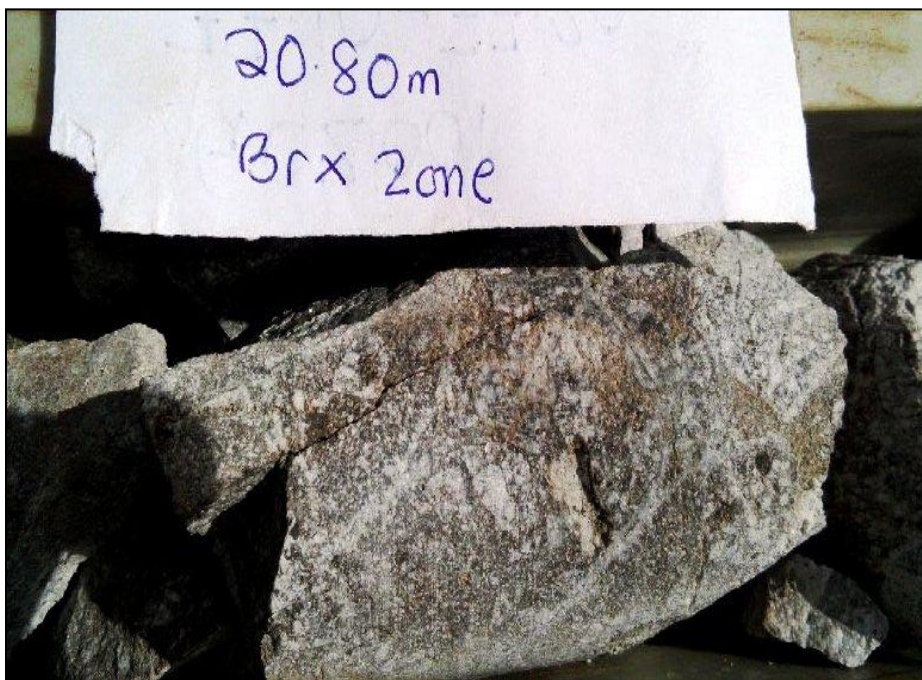
Intermediate medium to coarse grained diorite with pervasive quartz crystals in a weak-moderately leached black-gray matrix. Minor quartz veinlets. Black interstitial mineral decomposing.

19.3-21.1m: Porphyritic Feldspar Diorite

Strongly silicified fine to medium grained crowded feldspar porphyry diorite with breccia.

19.3 to 20- 20.4m: Very fine-grained with pervasive strong brown alteration and strong silicification with quartz veinlets, pyrite is mostly disseminated and hairline veinlets.

20.4-21.2m is a breccia zone with sub-angular to angular and sub-rounded strong brown altered diorite clasts. Extremely silicified strong brown alteration with strong pyrite + chalcopyrite. At 21.2 to 21.9m is a zone of crowded medium-grained feldspar diorite, pervasively disseminated, fracture fill and hairline veinlets. Extremely silicified with quartz breccia vein with sulphides.



21.9-33.5m: Diorite

Fine-grained felsic to intermediate Diorite with quartz-green elongated hornblende + magnetite + feldspar in gray-green zones while bleached zones have moderate to strong pervasive brown alteration development, pyrite + chalcopyrite is disseminated to fracture fill veinlets with clusters, bleached zones with brown alteration are moderately silicified. 3% sulphides (pyrite + chalcopyrite).

33.5-47.0m: Diorite

Very fine-grained silicified and bleached with pervasive moderate to strong brown alteration overprinting. Strong pyrite + chalcopyrite disseminated to hairline veinlets to fracture fill, biotite+ magnetite+ minor epidote -chlorite. Some weak leaching at places. Fault with clay+ pyrite at 42.4-42.5m; breccia zone with strong pervasive brown alteration and strong silicification at 42.5-44.1m. Breccia zone contains silicified diorite and fine-grained gray diorite and silicified porphyritic quartz diorite clasts/xenoliths that have strong



brown alteration. Pyrite-cpy disseminated, fracture fill and hairline veinlets.

44.1-44.8m: Extremely silicified breccia with Quartz veinlets encompassing angular clasts of very fine grained pale gray diorite. Sulphides are disseminated, fracture fill and veinlets. Quartz veinlets are comb to saccharoidal.

44.8-45m: Fault with clay infill. Strong to extremely weathered with clay+ pyrite at 44.95m. From 44.80 to 44.95m is a silicified zone that has suffered high fracture density and shearing with weak fracture weathering and pyrite development.

45-47m: Fine to medium grained pale grey to bleached diorite with moderate to strong silicification developing. Pyrite + chalcopyrite (cpy) is disseminated-fracture fill-veinlets (3%). Minor faulting with shearing and moderate fracture controlled weathering and clay-pyrite developing at 45.3-45.4m. From 45.6-46m is a zone of breccia with a thin bed of a very fine grained volcanic rock which cross cuts it. Moderate weathering with weak clay developing, vitreous quartz breccia veinlets cut and displaces fine grained gray-brown laminated sandstone/volcs? Fine grained thin bed trending N-S and quartz breccia trending NE-SW.

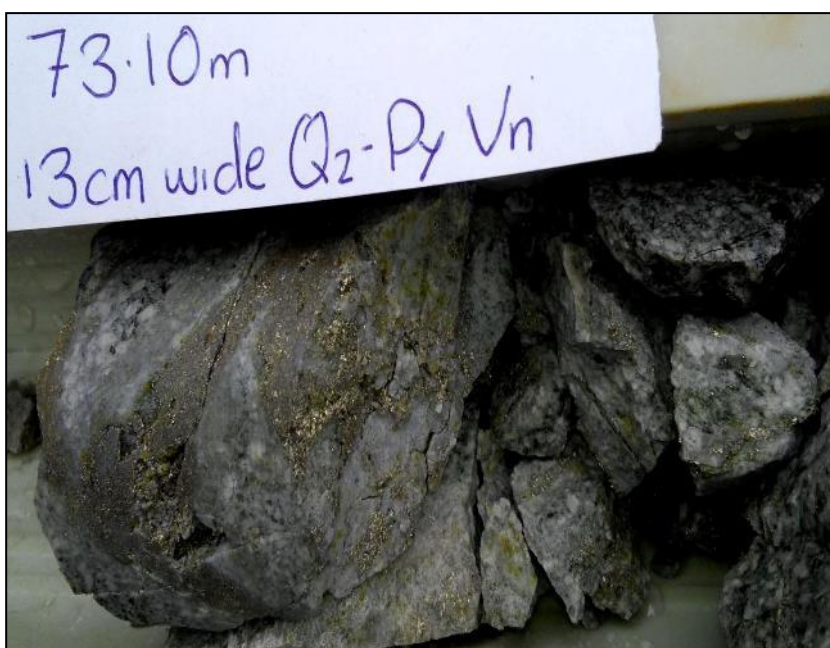
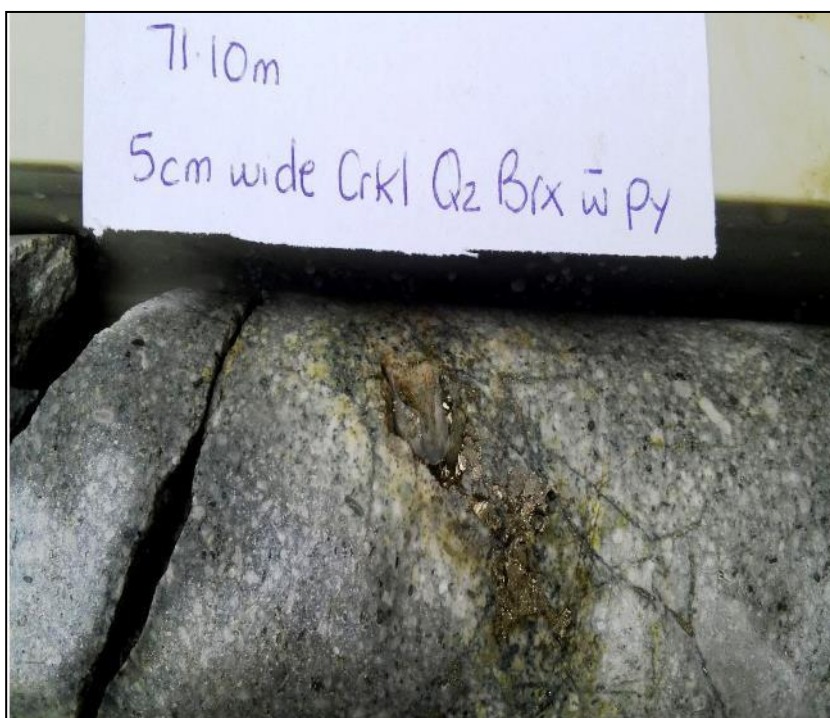
#### 47-65.8m: Feldspar Porphyry

Porphyritic diorite with crowded coarse feldspar phenocrysts, biotite+ magnetite+ sparse epidote +pyrite disseminated in white feldspar matrix. Sparse pyrite + chalcopyrite veinlets with clumps, very weak brown alteration developing at places especially in bleached zones. Clasts supported feldspar with interstitial biotite +magnetite +black minerals. From 49-49.3m is a sheared and shattered zone with strong leaching and strong pervasive brown alteration. Quartz flooding. Green chlorite replaced by epidote and pyrite replacing epidote. Black mineral(s) decaying and replaced by epidote-pyrite at places. Porphyritic quartz diorite. Sparse hornblende phenocrysts/xenoliths of very fine grained black volcanics at places. Generally, a strongly silicified rock.

Quartz Diorite with quartz+ pyrite veins. Very strong pervasive silicification with weak-mod pervasive brown biotite alteration associated with quartz-pyrite veining at 60-65.9m.

#### 65.8-77m: Diorite

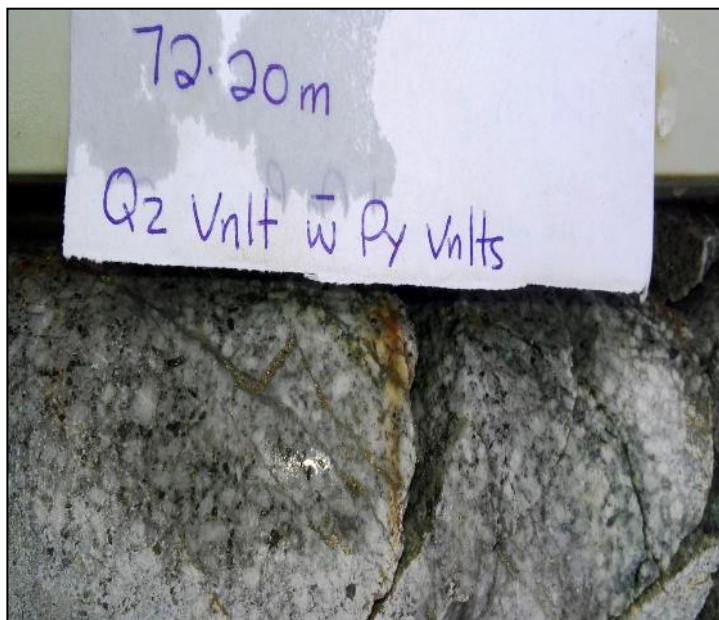
Grey to green porphyritic diorite. Coarse feldspar phenocrysts set in white siliceous matrix, abundant hornblende phenocrysts + biotite + epidote + chlorite. Pyrite+ Cpy veinlets-fracture fill-diss-clusters.



Quartz veinlets at places with massive pyrite clusters in fractures.

77-88.4m: Quartz diorite (mostly felsic with grey-green zones)

Silicified porphyritic diorite with abundant Quartz crystals. Strongly pervasive silicification with Quartz veins with pyrites. Xenoliths of very fine grained volcanic rock sparsely emplaced in this rock unit and breccia zones at places. Strongly silicified-quartz zones and brecciated zones are overprinted with moderate to strong brown alteration. Pyrite veins observed at places, zones of grey-green siliceous porphyritic diorite with abundant hornblende phenocrysts, epidote replacing chlorite in grey-green zones.



88.4-90.4m: Andesite (Dyke)

Very fine-grained mid green rock with elongated green hornblende (hbl) phenocrysts and chlorite-epidote phenocrysts set in a siliceous matrix. Pyrite replacing epidote+ chlorite. Strong pyrite + chalcopyrite as disseminated (diss)-fracture fill-veinlets-clumps (5-10%).

90.4-90.8m: Crackle Breccia

Extremely silicified and altered diorite with crackle brecciation by quartz-pyrite veinlets. Pyrite clumps, fracture fill and disseminated. Pervasive moderate chlorite+ epidote with pyrite replacing epidote.

90.8-104.2m: Quartz Diorite (alternating zones of felsic and intermediate)

Coarse euhedral quartz + feldspar phenocrysts set in felsic-intermediate siliceous matrix with decomposing hornblende + biotite. Intermediate zones are grey to green with siliceous matrix that has chlorite-epidote-pyrite alteration. Abundant black hornblende + biotite. Pyrite-cpy diss, fracture fill, clumps and veinlets. Felsic zones are strongly silicified with quartz veins with pyrite. Weak brown alteration overprinting. Hornblende + biotite, epidote-pyrite in fractures and disseminated pervasively. Strong pyrite veins-frac fill-diss in quartz veins-extremely silicified zones.

104.2-111.6m: Extremely Silicified Crackle Breccia

Extremely silicified weak porphyritic grey diorite to crowded medium-grained porphyritic diorite crackle brecciated by quartz veining. Strong pervasive brown alteration overprinting, pyrite replacing epidote. High quartz veining intensity.

108.3-109.3m - a Quartz vein with comb-Saccharoidal-bladed textures and carries pyrite and dark- silvery powdery sulphides in vugs/cavities.

111.6-114.70m: Diorite

Highly silicified fine-medium grained grey to pale grey diorite with sparse quartz veinlets and minor breccias. pyrite-cpy are mostly disseminated-fracture fill and minor clumps-moderate





hairline veinlets.

113.7-114.7m is an extremely silicified fine grained pale diorite with significant pyrite-cpy occurring as disseminations-veinlets and fracture fill.

#### 114.7-115.9m: Andesite Dyke

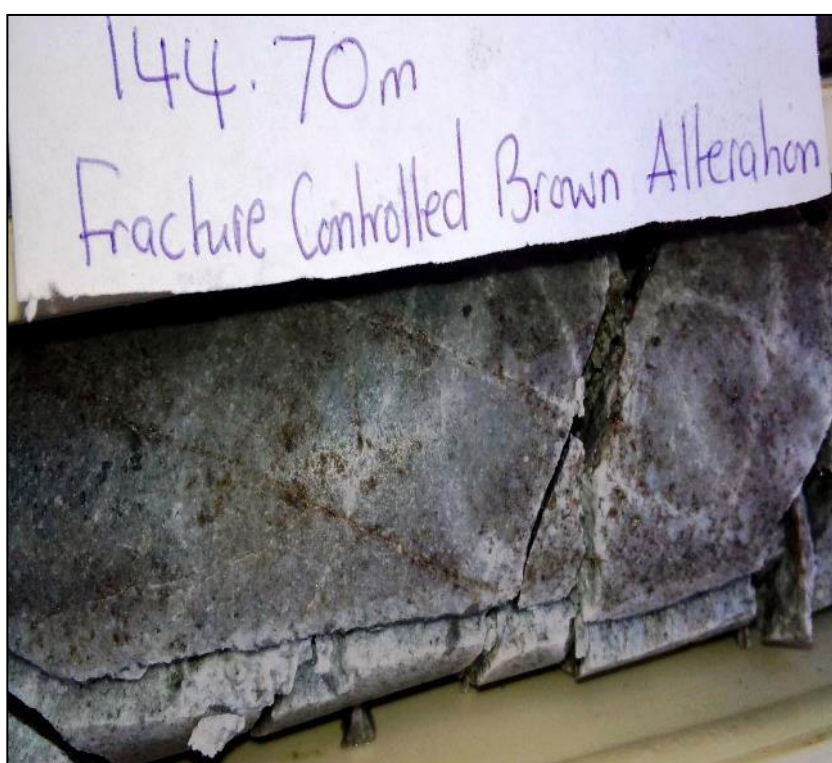
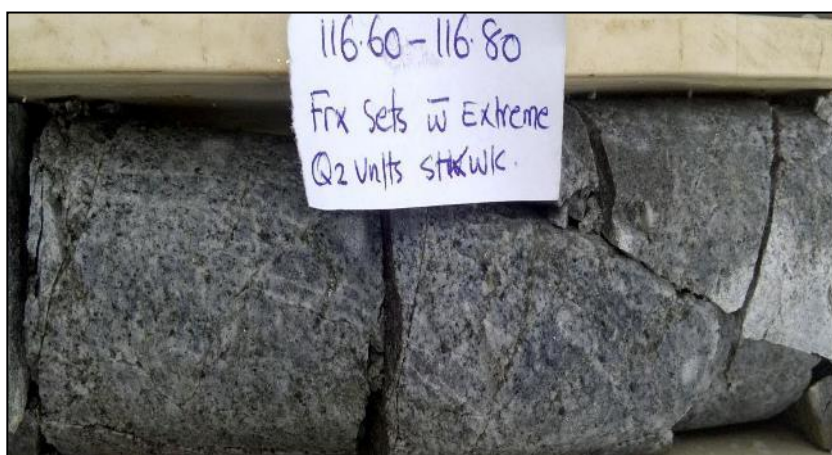
Very fine grained green weak silicified volcanic dyke with sparse elongated-square coarse -sub rounded hornblende (hbl). Pervasively disseminated 5% fine grained- clumps-micro veinlets of pyrite-cpy.

#### 115.9-119.7m: Diorite

Fine-medium grained pale grey silicified diorite overprinted by brown coloration. Extreme silicification with significant pyrite-cpy from 115.9-116.6m. In brown altered zones pyrite-cpy replaces black minerals. A crackle quartz breccia (bx) at 119.3-119.5m with weak (wk) pyrite disseminated in fractures.

#### 119.7-142.0m: Diorite

Fine -medium grained pale gray to white diorite with moderate to strong pervasive brown coloration. In gray zones pyrite replaces epidote /chlorite/ hbl /magnetite (mt)? while in bleached and brown zones pyrite replaces black minerals. White zones are moderate to extremely silicified (silica-quartz flooding) with quartz veinlets stwk producing crackle brecciation at places. Brown coloration is associated with/restricted to bleached /silicified zones. Pyrite-cpy occur as disseminations-fracture controlled veinlets (5-10%). Some silvery grey powdery stains observed in fractures within quartz veins. From 119.7-120.4m is an extremely fractured zone with stockwork quartz veinlets and weak weathering. Pyrite-cpy in fractures mostly replacing epidote/chlorite. From 120.4-121m is an extremely silicified zone with stockwork veinlets and minor pyrite. From 138.9-143.8m is a pale grey silicified





medium grained diorite. Very weak brown coloration. Some quartz-pyrite veining.

#### 142.0-151.2m: Diorite

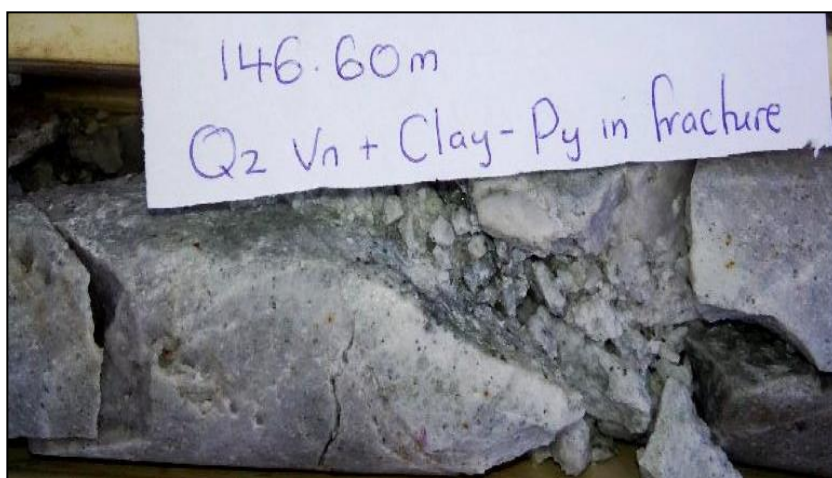
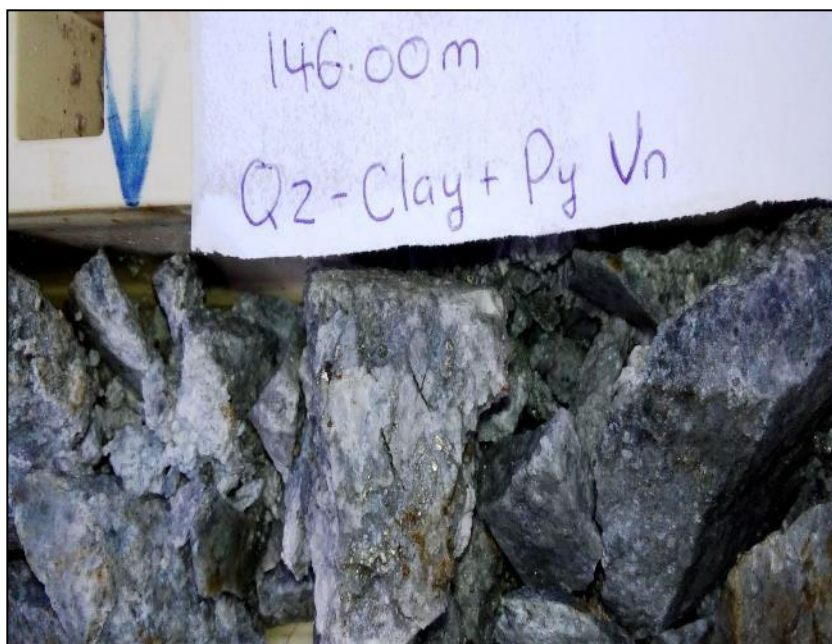
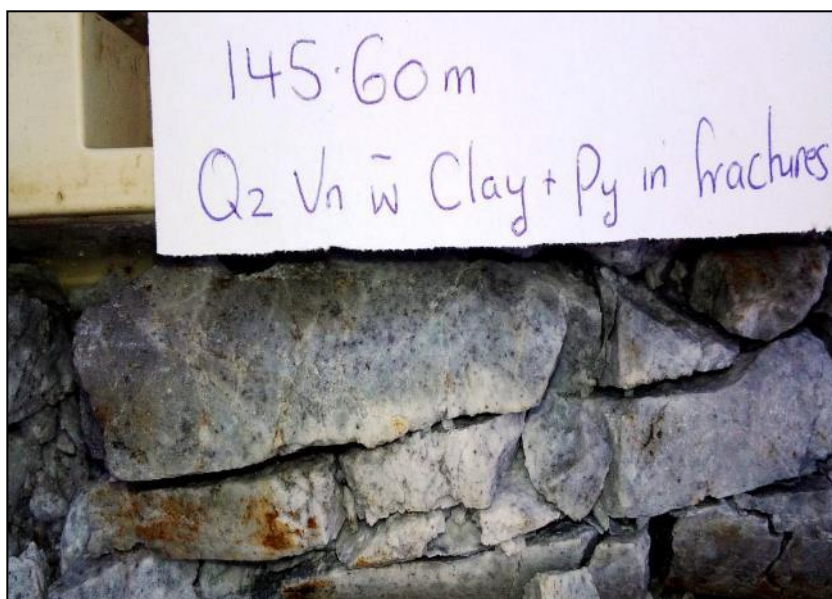
Strong to extremely silicified diorite with moderate-strong brown alteration mostly fracture controlled and selvaged along feldspar? /quartz+/-pyrite veinlets. Quartz veinlets-veins are vuggy to saccharoidal with pyrite as fracture fill to cavity fill and sometimes as clumps or clusters. Some quartz-pyrite veinlets and veins have clay in them.

#### 151.5-152.6m: Crowded Porphyritic Diorite

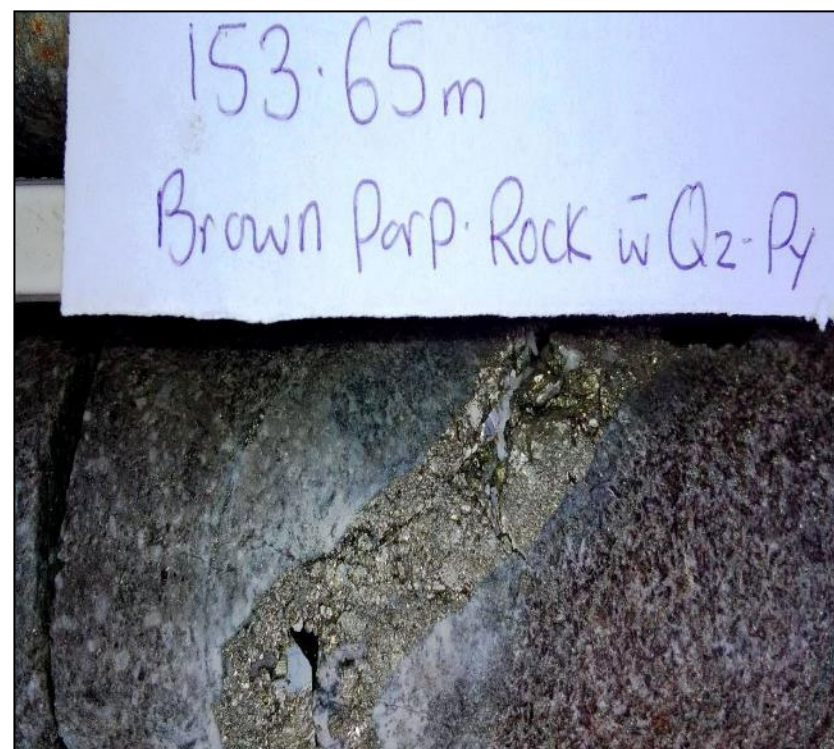
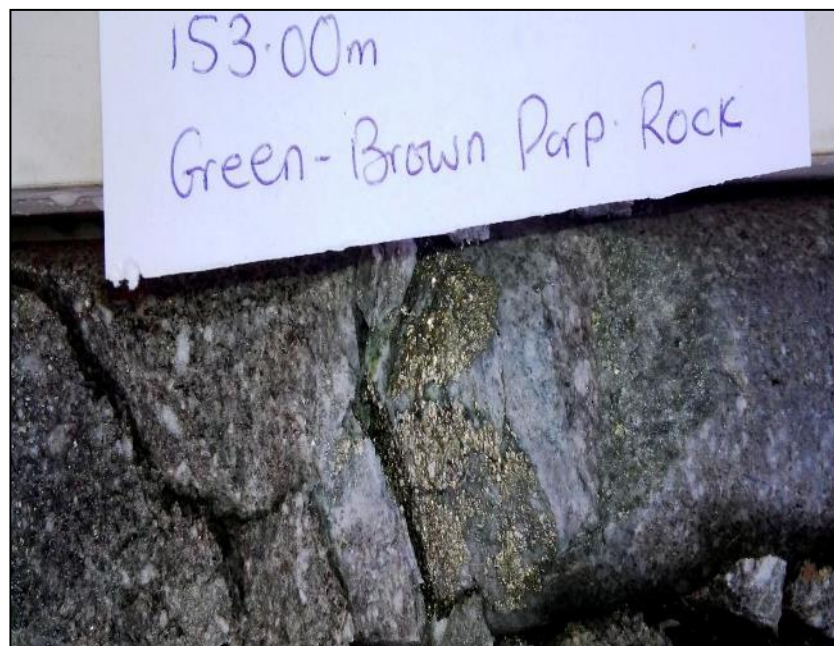
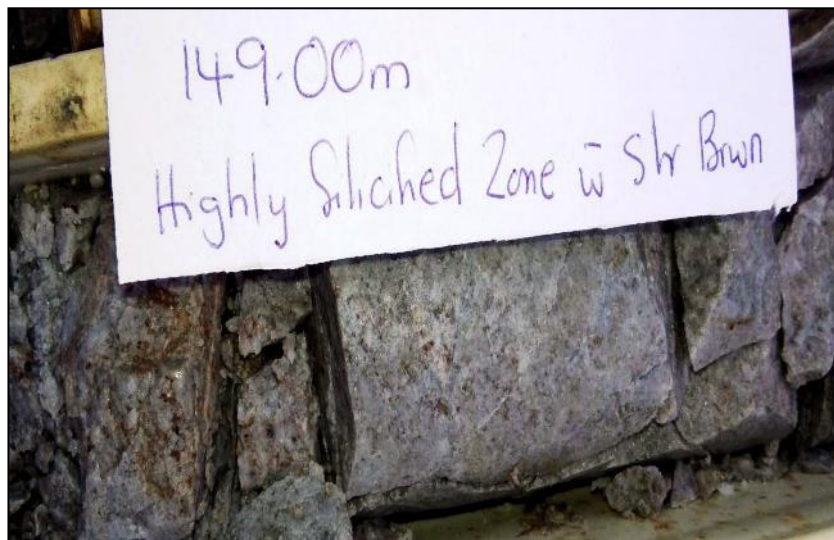
Highly silicified crowded medium grained porphyritic diorite. Angular xenoliths of altered very fine-grained volcanics with wk magnetite and disseminated 1mm quartz crystals. Feldspar-Sericite matrix with disseminated biotite within the matrix. Chlorite-epidote veinlets partially replaced by pyrite.

#### 152.6-154.4m: Dyke?

Green to strong pervasive brown altered weathered porphyritic rock. Green zones are silicified while the brown zones are weathered. 152.6-152.9m is a green silicified zone with white matrix with disseminated pyrite+/-chlorite-green acicular actinolite? /hbl? 152.9-153.9m is a zone of strong pervasive brown altered porphyritic diorite. Strong pervasive brown with Quartz (1mm) crystals + green chlorite-epidote. Massive pyrite vein (2cm) at 153 and 153.65 as fracture fill in quartz vein.



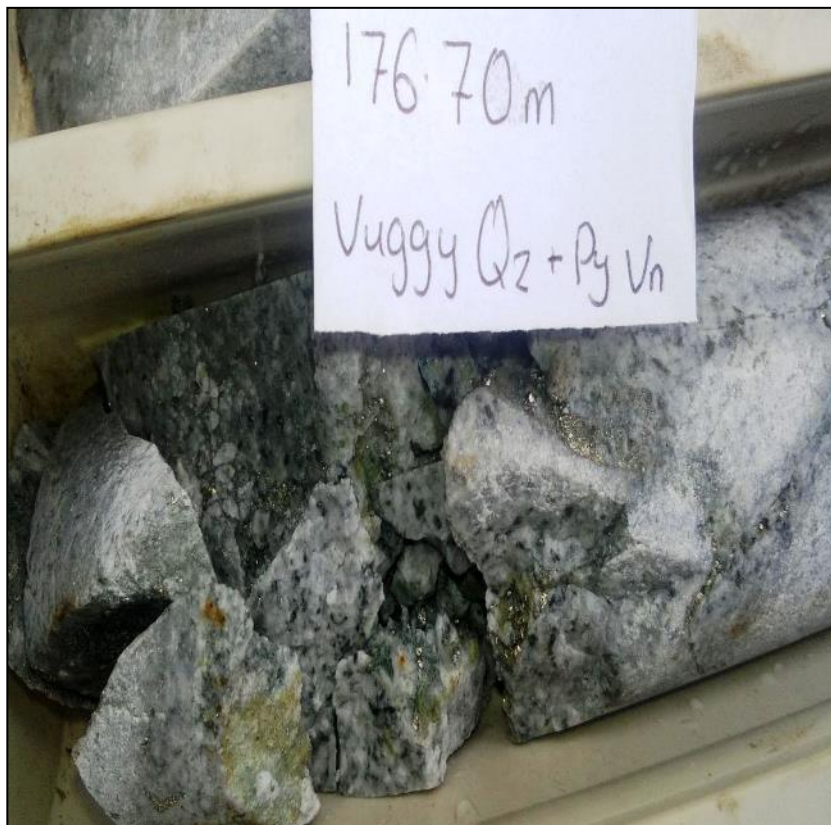






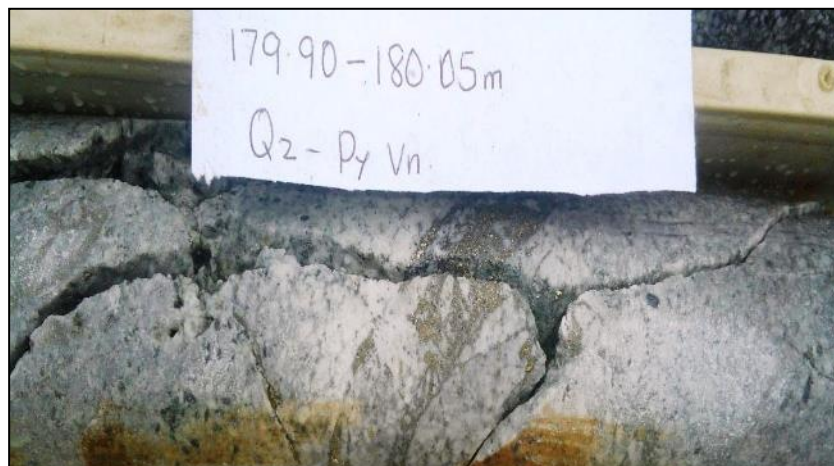
#### 154.4-184.3m: Diorite

Grey to pale grey medium-grained (up to 2mm) crowded feldspar porphyritic diorite set in very fine-grained white siliceous feldspar (fspar) matrix. Black opaque and anhedral mineral set in fspar phenocrysts. Sparse epidote replaced by pyrite at places. Sparse biotite (bio)-magnetite (mt) observed at places too. pyrite is mostly disseminated to fracture fill. Pyrite is observed to intergrown with epidote or biotite (bio). Sparse elongated hbl. Feldspars are subhedral while pyrite are euhedral and well developed as clusters in fractures within quartz veinlets/veins. Minor brecciation at places. Patches and zones of brown alteration observed at places. Minor zones of fine-grained silicified zones at places.



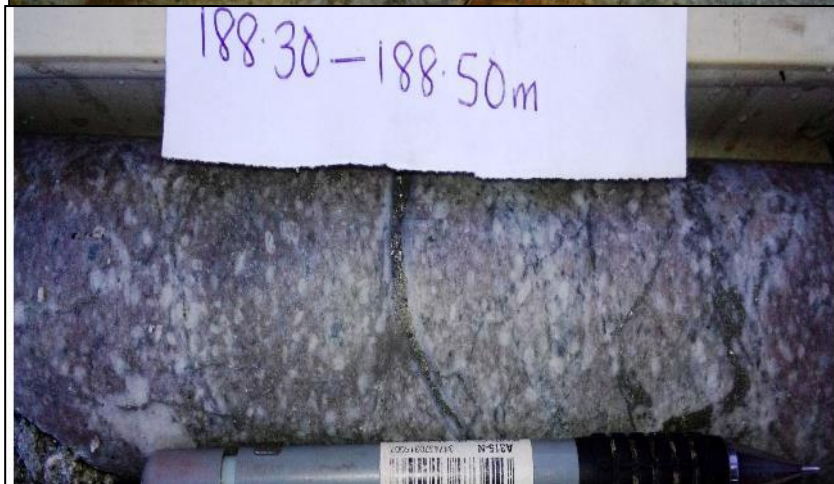
#### 184.3-194.2m: Diorite

Strongly silicified and altered medium-grained porphyritic diorite. Strong brown alteration pervasive patches at places. Quartz-pyrite veinlets/veins at places. Massive pyrite clusters and veins in fractures. Epidote replaced by pyrite in grey (matrix) zones. Strong pyrite clusters and veins in felsic-brown zones. Brown matrix alteration at places with strong intensity. Hbl-epidote in grey zones. Few fspar micro veinlets. Bio-chlorite-epidote in brown zones.



#### 192.4-194.9m: Diorite

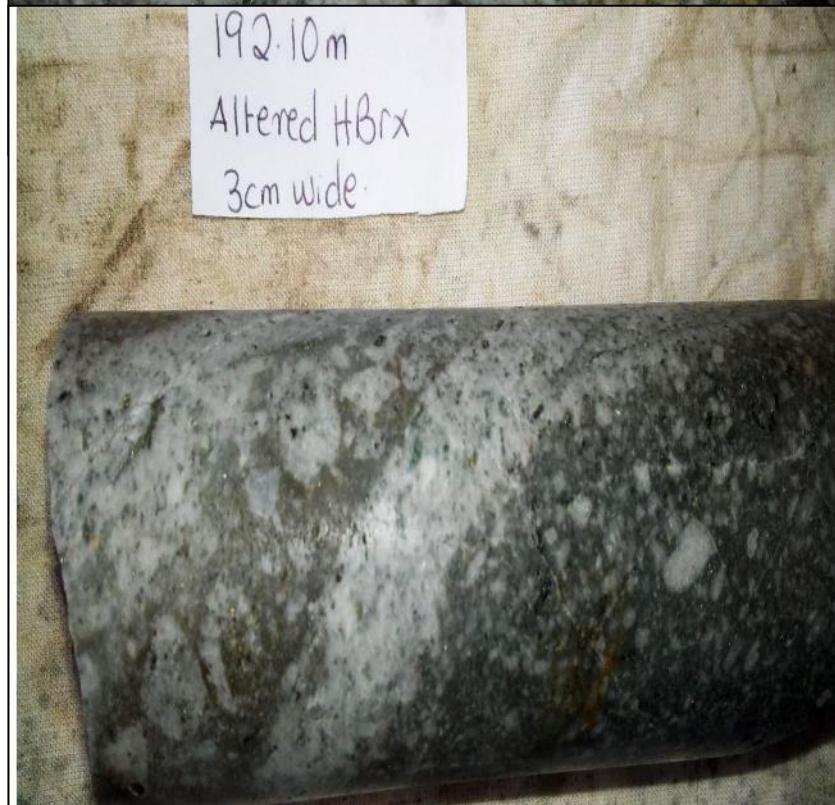
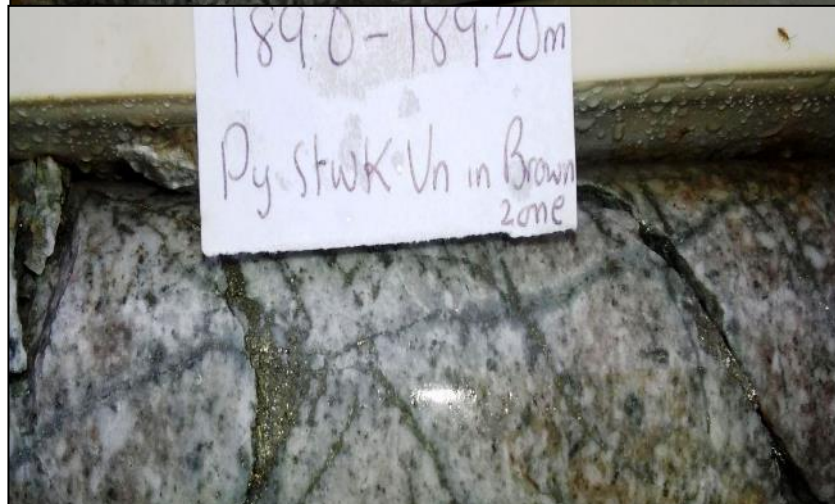
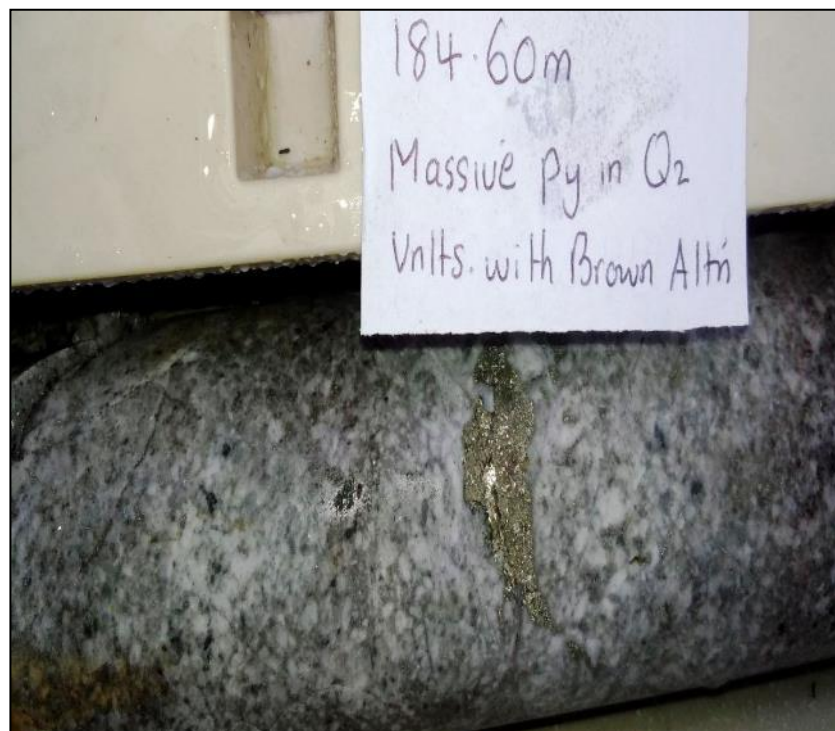
Grey-pale grey medium-grained crowded fspar (1mm) porphyritic diorite. Fspar (1mm) phenocrysts set in fine-grained grey-wk brown matrix. Pyrite is mostly disseminated in fractures. Minor chlorite-epidote-pyrite micro-veinlets with quartz. Sparsely disseminated bio. Weak quartz-pyrite veinlets at places.



#### 194.9-197.4m: Diorite

Pale green-white altered crowded medium-grained fspar diorite. abundant chlorite-epidote as micro-veinlets and disseminations. Hbl and bio disseminations. Micro-veinlets of black mineral (mt?). very weak brown coloration locally within bio phenocrysts. Clay alteration overprinting.





197.4-201.2m: Diorite

Crowded medium-grained fspar diorite. Fspar phenocrysts set in pale grey-brown matrix. Abundant micro-veinlets of vuggy quartz with pyrite in fractures. Euhedral angular quartz clasts (2cm milky barren) sparsely disseminated. Pervasive chlorite-epidote in grey zones while in brown matrix zones they have been moderately altered. Hbl + bio observed in grey zones.

201.2-206.2m: Diorite

Strong –moderately altered crowded medium-grained Fspar porphyry diorite. Pale grey-wk brown alteration overprinting. Pale grey zone has epidote-pyrite intergrown in fractures, micro pyrite veinlets and fracture fill. Wk to strong scaly silica in fractures. pyrite clusters with subhedral grains in fractures. Hydrothermal breccia observed at 205.9-206.2m.

206.2-208.1m: Diorite

Medium-grained (1mm) crowded feldspar porphyry diorite with grey to wk brown matrix. Pervasively disseminated hbl + bio +mt? and sparse epidote mostly in fractures. Quartz with pyrite disseminated in vugs and fractures at places (1cm quartz veinlts). pyrite is also observed as replacing epidote. Thin silica selvages quartz veinlts.

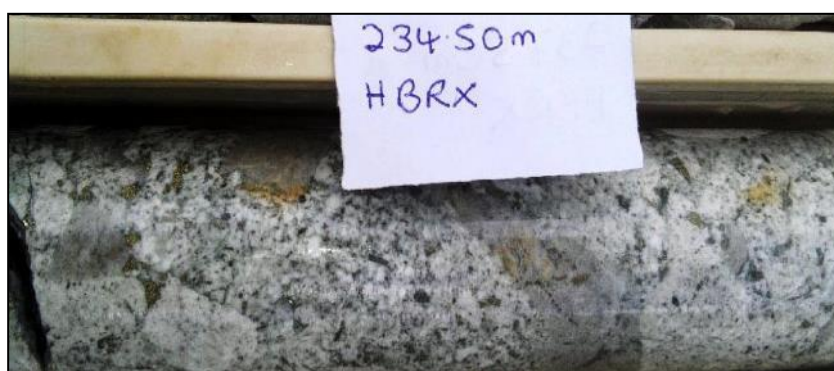


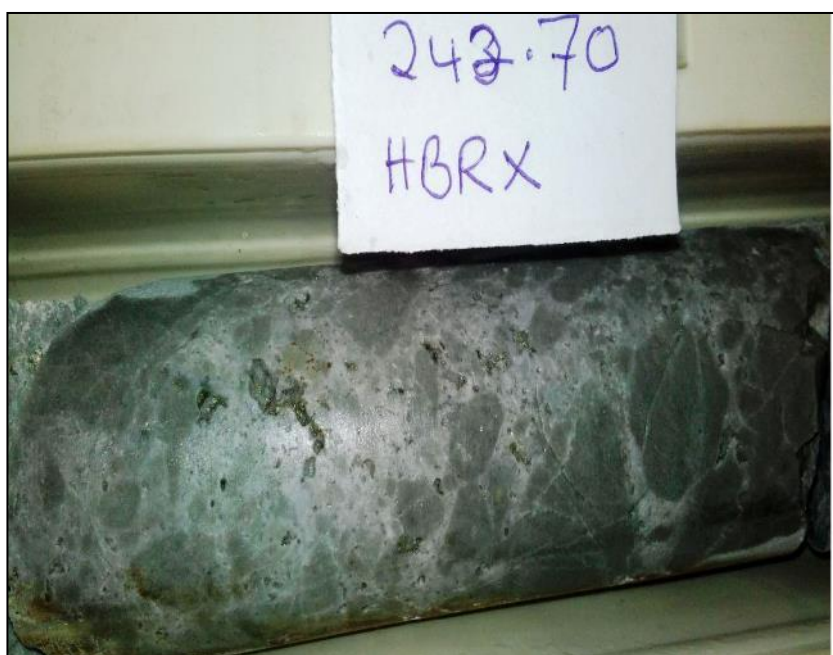
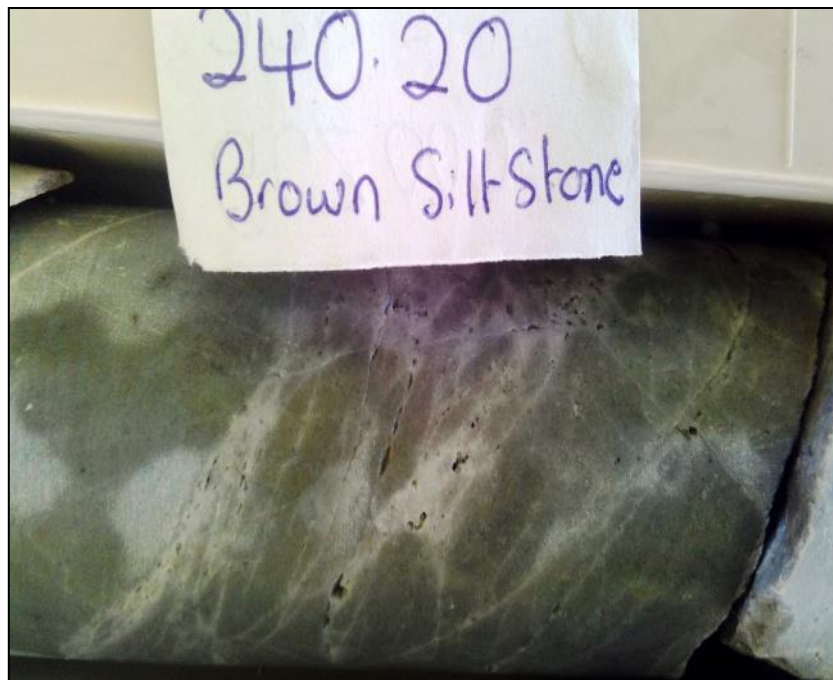
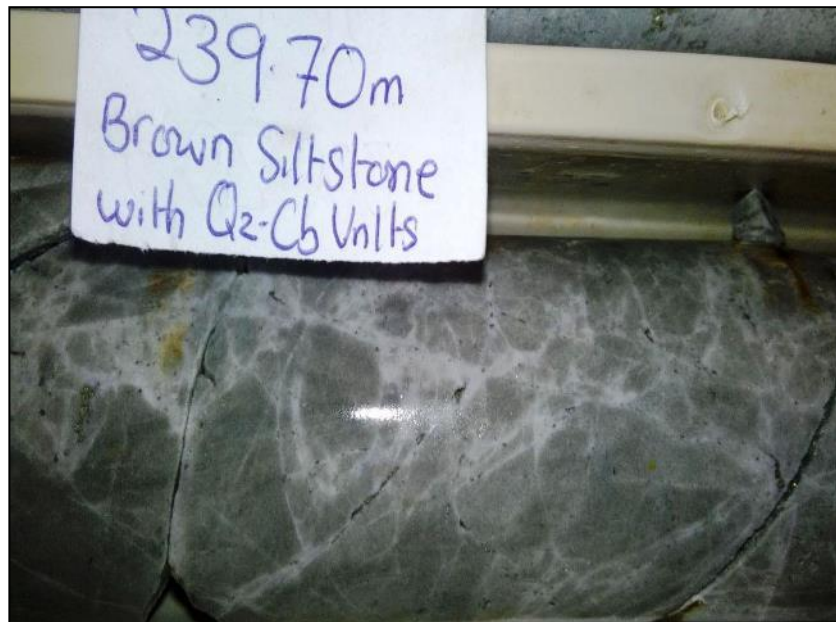


208.1-234m: Diorite

Pale spotty green siliceous and altered medium-grained diorite. Quartz-pyrite veining. Moderate clay (argillic) alteration overprinting. Ubiquitous micro discontinuous pyrite veinlets, pervasive chlorite-sericite. Altered medium-grained cloudy crowded fspar as matrix (phenocrysts supported). Epidote and pyrite intergrown in fractures. Pervasive hornblende + biotite+ chlorite+ epidote in weakly altered zones. Quartz veinlets to veins at places with pyrite clusters in vugs. Zones of pervasive brown alteration at places. Minor quartz-carbonate-pyrite veining at places too. Minor brecciations (10-30cm) at places.

234.2-239.26m: Hydrothermal Breccia Intensely silicified, clast supported. Wk grey to strong brown silicified mostly euhedral angular clasts of siltstones and strongly altered bleached (white) fine to medium-grained diorite. Very strong pyrite + chalcopyrite occurring ubiquitously as discontinuous veinlets, fine massive clusters in fractures and cavities and disseminated replacing/intergrown with black round-rectangular mineral(s). brown siltstone clasts increase down Depth. The brown siltstone clasts are observed to be encompassed in diorite clasts. Quartz carbonate clasts are also observed. Quartz carbonate clasts are vuggy with pyrite in the pores and vugs. Pyrite + chalcopyrite is mostly around the edges of the siltstone clasts and within the diorite clasts. Brown siltstone clasts contain lattice network of white veinlets both closed and open. The open veinlets are filled by epidote-pyrite-chalcopyrite. Diorite also has fine brown spots replacing black (mt?) mineral.







239.26-251.4m: Siltstone

Moderate brown altered siltstone with intense quartz carbonate? Stockwork veinlets. pyrite-chalcopyrite in cavities with quartz carbonate veinlets. Quartz carbonate veinlets show lattice bladed and saccharoidal textures. Weak grey-mod brown alteration cut by white bleaching imposed by white quartz carbonate veinlets. Pyrite-chalcopyrite are disseminated to fracture fill veinlets from 240.40-246.8m in a zone in extreme lattice network quartz carbonate veinlets giving a stockwork brecciation texture. Some massive pyrite veinlets with coarse euhedral crystals observed at places.

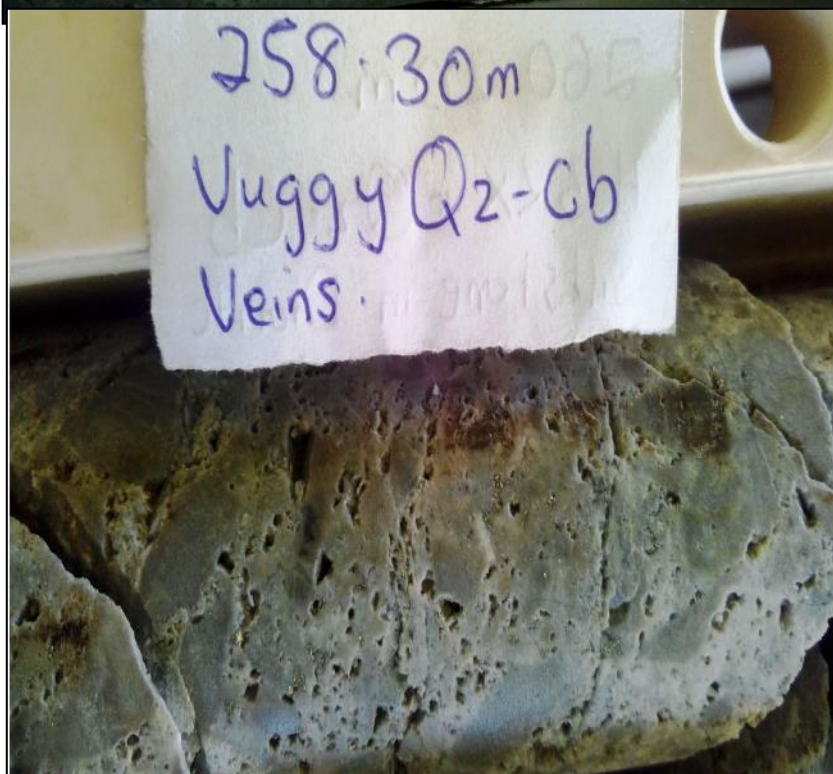


251.4-253.0m: Diorite

Weak grey to felsic silicified and altered fine-grained porphyritic diorite. Fracture fill pyrite + chalcopyrite discontinuous veinlets and clusters. Weak epidote in fractures at places.



253.0-261.10m: Hydrothermal Breccia in siltstone and diorite respectively. Strongly altered pale grey-felsic diorite clasts set in siltstone with quartz carbonate veinlets with vugs filled by pyrite clusters and veinlets. Vugs in quartz carbonate veinlets are bladed to scaly in texture. From 253-256.4m the Hydrothermal breccia comprises diorite clasts set in siltstone while from 256.40-261.1m the siltstone clasts are set in diorite. Quartz-carbonate-silica veinlets/veins encompasses the clasts. Pyrite + chalcopyrite not common in siltstone but are common in diorite clasts. Weak-moderate pervasive brown alteration bleached by veinlets of quartz carbonate overprinting.



261.1-264.0m: Andesite - mid green fine-grained weakly porphyritic. ~1cm max width fracture fill white quartz carbonate vein with weak disseminated pyrite parallel to axis. Weak grey to mid green siliceous



matrix. Pervasive chlorite-epidote disseminated, fine-grained black bio + hbl +/- Mt. pyrite + chalcopyrite intergrown with epidote.

#### 264.0-274.9m: Diorite

Pale green to grey fine to medium-grained crowded fspar fine porphyritic diorite. Weak to moderately silicified. Cl-epidote-pyrite + chalcopyrite in fractures and disseminated patches to pervasive at places in green zones. 264.9-266.9m is a quartz carbonate flooding with strong cavities and vugs. Moderate weathering. Weak pyrite (1%).

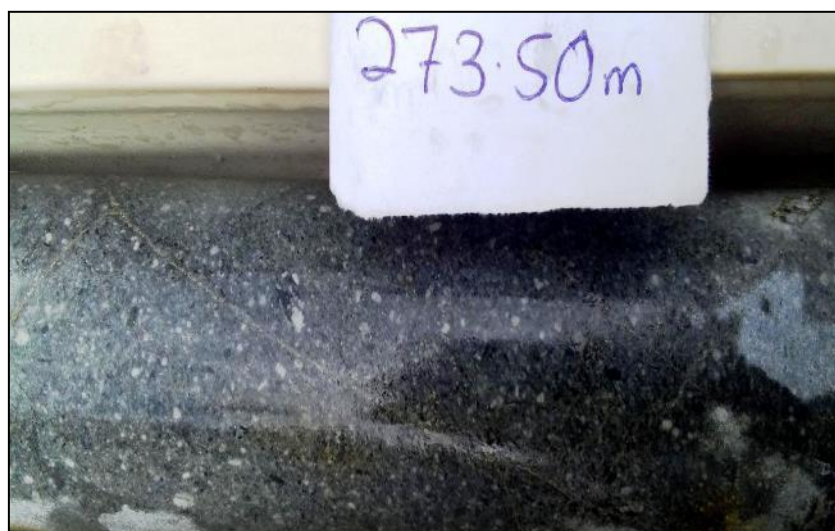
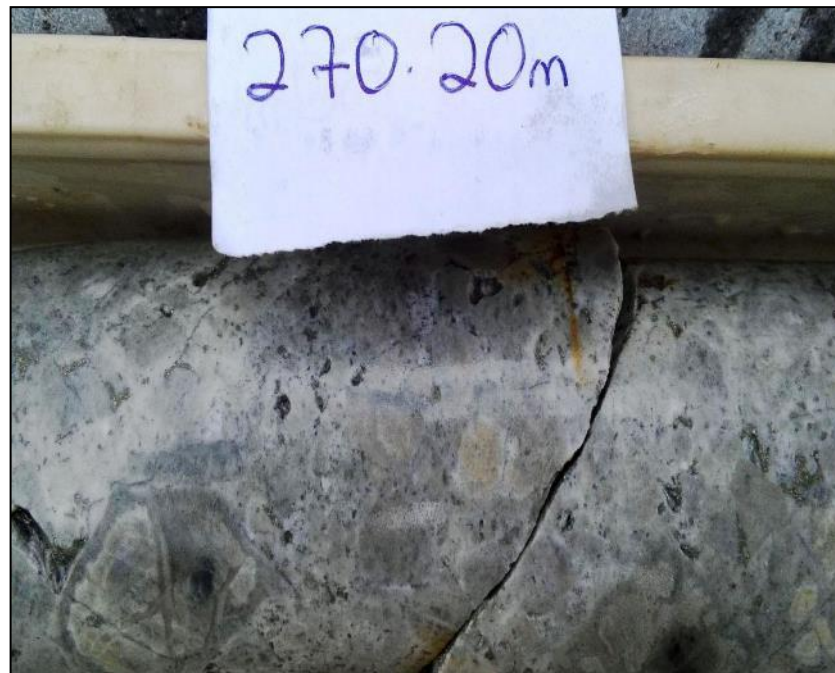
266.9-269.3m is zone of fine porphyritic grey diorite with crowded fine-grained black mt grains and discontinuous micro-veinlets. Minor brown alteration patches at places with fine pyrite + chalcopyrite disseminated in fractures and in matrix.

From 269.3-270.5m is a pale to bleached altered dioritic hydrothermal breccia with silica flooding and vuggy quartz carbonate veinlets/veins encompassing brown altered siltstone clasts set in silicified dioritic matrix that has pyrite + chalcopyrite mostly in fractures and disseminations as well as clusters. Chlorite-epidote in wk-mod bleached zones.

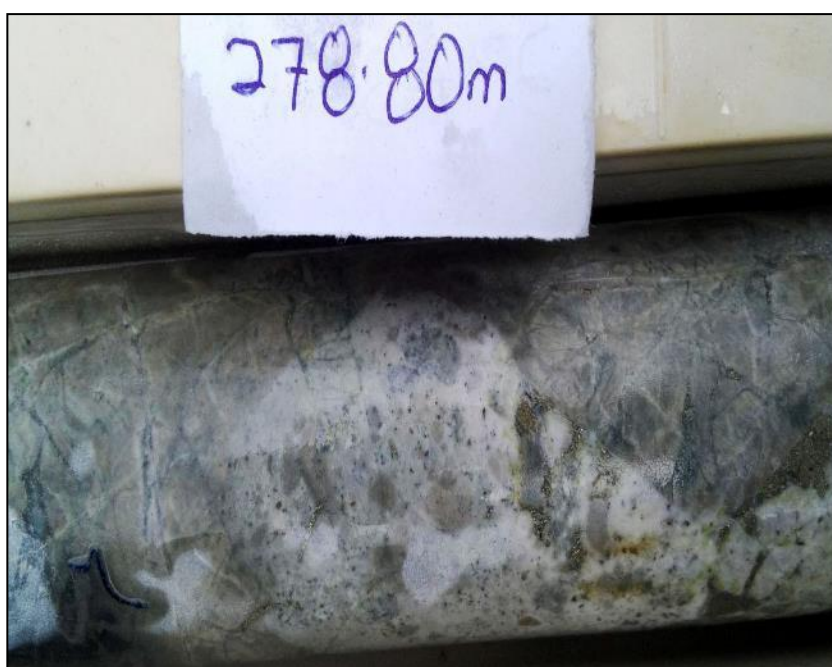
From 270.5-274.9m is fine to medium-grained diorite with pyrite + chalcopyrite clusters fractures and pervasive disseminations. Epidote in fractures and micro-veinlets at places in grey diorite zones. From 269.7-270.7m is a quartz carbonate veinlets flooding-Hydrothermal breccia.







274.9-281.8m: Mudstone/Siltstone  
Partially altered black to weak brown to partially bleached mudstone. Very strong stockwork of quartz carbonate veinlets. Zones of diorite breccia at places. pyrite is mostly cavity fills in quartz carbonate veinlets and fractures. Bleaching is imposed by quartz carbonate veining and selvage the veinlets. Brown alteration overprints fresh black siltstone and is later bleached. From 277.1-278.9m is a very strong silica flooding with crackle brecciation. Strong pyrite + chalcopryrite veinlets-clumps-disseminations-fracture fill. This zone has green-mod brown alteration associated with it.







#### 281.8-299.0m: Siltstone

Black siltstone with moderate brown alteration and strong bleaching associated with quartz carbonate veining. Strong quartz carbonate stockwork veinlets-veins, multiple zones of quartz-silica flooding that creates crackle brecciation textures with very strong pyrite clustering in fractures, fracture fill micro veinlets and disseminations. Brecciation zones comprise diorite and brown angular siltstone clasts of varying sizes. Breccias zones are from 1cm to 1m. quartz carbonate veinlets/veins are vuggy with pyrite in the vugs.



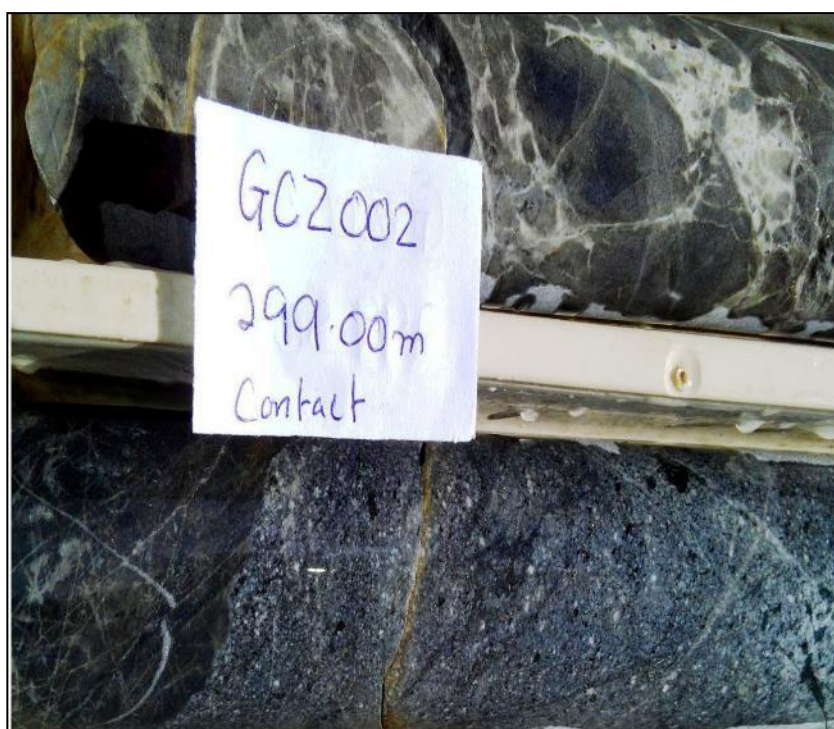






299.00-303.9m: Diorite

Medium-grained crowded porphyritic diorite with siliceous matrix. Grey to pale grey with weak brown alteration developing down the hole. Abundant and ubiquitous mt-bio grains with moderate brown alteration. Strong pyrite + chalcopyrite disseminated pervasively. Micro-veinlets of fine pyrite + chalcopyrite. Pyrite + chalcopyrite intergrown with mt-bio grains. Some crystals of hbl sparsely disseminated. Magnetite micro-veinlets observed at 299.0-300.7m. Quartz veining is weak from 299.0-303.7m. Chlorite-epidote-sericite observed at 300.7-303.4m with siliceous matrix and brown alteration developing. From 303.4-303.9m is a dark grey fine-grained porphyritic diorite that has strong stockwork of quartz carbonate veinlets developing and bleaching associated with it. Weak brown films selvage along the quartz carbonate veinlets and in the matrix. Brown alteration intensity is observed to be increasing down the hole.







#### GCZ 002 Selective Samples Descriptions

Sample Number: 650085      Depth: 20.4-21.9m

Highly silicified fine to coarse-grained diorite with quartz-pyrite vein at 21.3m

Sample Number: 650086      Depth: 26.2-27.2

Highly silicified medium-grained diorite with quartz-pyrite veinlets.

Sample Number: 650087      Depth: 31.2-32.4m  
Silicified-leached medium-grained diorite with quartz-pyrite veining and crackle breccia developing.

Sample Number: 650088      Depth: 40-41m  
Silicified-leached grey-weak brown medium-grained diorite with weak crackle brecciation by quartz veining. Minor pyrite in quartz veinlets.

Sample Number: 650089      Depth: 41-42.5m  
Weakly leached moderately silicified grey medium-grained diorite. Quartz veinlets with Fracture fill pyrite.

Sample Number: 650090      Depth: 42.5-44m  
Hydrothermal breccia with weak to moderate pervasive brown alteration. Highly silicified (quartz-silica matrix) with fracture fill and disseminated pyrite.

Sample Number: 650091      Depth: 44-45.5m  
Hydrothermal breccia-strongly leached medium-grained grey diorite with fracture fill and disseminated pyrite.

Sample Number: 650092      Depth: 45.5-46.5m  
Leached grey diorite. Faulted breccia with disseminated pyrite in fault gorge and fractures.

Sample Number: 650093      Depth: 61.7-62.7m  
Highly silicified medium-grained felsic diorite with quartz-pyrite veinlets.

Sample Number: 650094      Depth: 62.7-63.7m  
Highly silicified medium-grained felsic diorite with quartz-pyrite veinlets.

Sample Number: 650095      Depth: 65-66m  
Highly silicified medium-grained felsic diorite with quartz-pyrite veinlets.

Sample Number: 650096      Depth: 70.8-72  
Strongly silicified medium-grained pale grey diorite. Hbl phenocrysts disseminations. pyrite is mostly disseminated and fracture fill.

Sample Number: 650097      Depth: 72-73.5m  
Strongly silicified medium-grained pale grey diorite with quartz-pyrite vein at 73.2m. pyrite is disseminated pervasively and as fracture fill.

Sample Number: 650098      Depth: 80-81m  
Silicified porphyritic diorite. Strong pervasive silicification with quartz veins with pyrites. Hydrothermal breccia with quartz-pyrite veinlets at 80-80.80m.

Sample Number: 650099      Depth: 81-82m  
Medium-coarse-grained grey diorite with quartz-pyrite veinlets with breccia at 81.3-82m.

Sample Number: 650100      Depth: 82-83m  
Extremely silicified medium-grained grey diorite with quartz breccia with pyrite disseminated and fracture fill.

Sample Number: 650101      Depth: 101.4-102.9m  
Medium-grained felsic diorite. Strongly silicified with quartz-pyrite vein at 101.8m.

Sample Number: 650102      Depth: 102.9-104.2m  
Medium-grained silicified felsic diorite with multiple quartz-pyrite veinlets at places.

Sample Number: 650103      Depth: 104.2-105.8m  
Silicified medium-grained grey diorite with stockwork quartz veinlets with pyrite. Weak crackle brecciation by Quartz veinlets.

Sample Number: 650135      Depth: 232-234.3m  
Pale-spotty green siliceous medium-grained diorite with quartz-pyrite veinlets and clay alteration overprinting and ubiquitous discontinuous micro pyrite veinlets. From 232-232.5m is medium-grained grey



to pale grey crowded fspar porphyritic diorite. Fine grained hbl-bio-mt in grey to pale grey matrix. Fine pyrite-chalcopyrite in fractures. Sparse disseminated epidote, wk pyrite-chalcopyrite in wk quartz carbonate veinlets.

Sample Number: 650136          Depth: 234.3-235.8m

Hydrothermal breccia that is clasts supported and comprises strongly silicified angular clast of weak grey to strong brown siltstone and fine to medium-grained bleached diorite. Very strong ubiquitous pyrite + chalcopyrite as discontinuous veinlets, fine massive clusters and disseminations in fractures, cavities and pores as well as intergrown with black round-rectangular minerals. Brown siltstone clasts are observed as being encompassed by diorite clasts. Vuggy quartz carbonate with pyrite + chalcopyrite clasts are also observed as sparse disseminations.

Sample Number: 650137          Depth: 235.8-237.3m

Hydrothermal breccia that is clasts supported and comprises strongly silicified angular clast of weak grey to strong brown siltstone and fine to medium-grained bleached diorite. Very strong ubiquitous pyrite + chalcopyrite as discontinuous veinlets, fine massive clusters and disseminations in fractures, cavities and pores as well as intergrown with black round-rectangular minerals. Brown siltstone clasts are observed as being encompassed by diorite clasts. Vuggy quartz carbonate with pyrite + chalcopyrite clasts are also observed as sparse disseminations.

Sample Number: 650138          Depth: 237.3-238.8m

Hydrothermal breccia that is clasts supported and comprises strongly silicified angular clast of weak grey to strong brown siltstone and fine to medium-grained bleached diorite. Very strong ubiquitous pyrite + chalcopyrite as discontinuous veinlets, fine massive clusters and disseminations in fractures, cavities and pores as well as intergrown with black round-rectangular minerals. Brown siltstone clasts are observed as being encompassed by diorite clasts. Vuggy quartz carbonate with pyrite + chalcopyrite clasts are also observed as sparse disseminations.

Sample Number: 650139          Depth: 238.8-240.3m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill.

Sample Number: 650140          Depth: 240.3-241.8m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill. This zone contains intense lattice network of quartz carbonate veinlets that resulted in a stockwork brecciation.

Sample Number: 650141          Depth: 241.8-243.4m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill. This zone contains intense lattice network of quartz carbonate veinlets that resulted in a stockwork brecciation.

Sample Number: 650142          Depth: 243.3-244.8m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill. This zone contains intense lattice network of quartz carbonate veinlets that resulted in a stockwork brecciation. 3 x massive pyrite veinlets (5mm) between 243.4-244.3m.

Sample Number: 650143          Depth: 244.8-246.3m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as

clusters, disseminations and fracture fill. This zone contains intense lattice network of quartz carbonate veinlets that resulted in a stockwork brecciation.

Sample Number: 650144            Depth: 246.3-247.8m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill.

Sample Number: 650145            Depth: 247.8-249.3m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill.

Sample Number: 650146            Depth: 249.3-250.8m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-chalcopyrite. The vugs and cavities in quartz carbonate veinlets are lattice bladed and saccharoidal. Siltstone is weak grey-mid brown-partially bleached by quartz carbonate veinlets. Pyrite in siltstone as clusters, disseminations and fracture fill. High intensity of cavities and pores in this zone.

Sample Number: 650147            Depth: 250.8-252.3m

Mid brown siltstone with intense quartz carbonate stockwork veinlets with multiple vugs and cavities filled by pyrite-cpy and silicified pale grey to white fine-grained porphyritic diorite. Fracture fill discontinuous veinlets and disseminated pyrite + chalcopyrite. Fine pyrite + chalcopyrite clusters at places. Very weak epidote in fractures.

Sample Number: 650148            Depth: 252.3-253.8m

Silicified pale grey to white fine-grained porphyritic diorite. Fracture fill discontinuous veinlets and disseminated pyrite + chalcopyrite. Fine pyrite + chalcopyrite clusters at places. Very weak epidote in fractures. Breccia zone from 253-253.8m

Sample Number: 650149            Depth: 253.8-255.3m

Strongly silicified hydrothermal breccia that comprises clasts of siltstone and medium-grained pale grey-bleached porphyritic diorite. Vuggy quartz carbonate veinlets/veins with pyrite stringers. Pyrite + chalcopyrite in vugs and fractures in quartz carbonate veinlets/veins. The breccia comprises diorite clasts set in siltstone in this zone.

Sample Number: 650150            Depth: 255.3-256.8m

Strongly silicified hydrothermal breccia that comprises clasts of siltstone and medium-grained pale grey-bleached porphyritic diorite. Vuggy quartz carbonate veinlets/veins with pyrite stringers. Pyrite + chalcopyrite in vugs and fractures in quartz carbonate veinlets/veins. The breccia comprises diorite clasts set in siltstone in this zone.

Sample Number: 650151            Depth: 256.8-258.3m

Strongly silicified hydrothermal breccia that comprises clasts of siltstone and medium-grained pale grey-bleached porphyritic diorite. Vuggy quartz carbonate veinlets/veins with pyrite stringers. Pyrite + chalcopyrite in vugs and fractures in quartz carbonate veinlets/veins. The breccia comprises siltstone clasts set in diorite in this zone. Quartz-carbonate-silica veinlets/veins as matrix. Pyrite-cpy not common in siltstone clasts.

Sample Number: 650152            Depth: 258.3-259.8m

Strongly silicified hydrothermal breccia that comprises clasts of siltstone and medium-grained pale grey-bleached porphyritic diorite. Vuggy quartz carbonate veinlets/veins with pyrite stringers. Pyrite + chalcopyrite in vugs and fractures in quartz carbonate veinlets/veins. The breccia comprises siltstone clasts set in diorite in this zone. Quartz-carbonate-silica veinlets/veins as matrix. Pyrite-cpy not common in siltstone clasts.

Sample Number: 650153            Depth: 259.8-261.1m

Strongly silicified hydrothermal breccia that comprises clasts of siltstone and medium-grained pale grey-bleached porphyritic diorite. Vuggy quartz carbonate veinlets/veins with pyrite stringers. Pyrite + chalcopyrite in vugs and fractures in quartz carbonate veinlets/veins. The breccia comprises siltstone clasts set in diorite in this zone. Quartz-carbonate-silica veinlets/veins as matrix. Pyrite-cpy not common in siltstone clasts.