

Young Rhyodacite Dikes Found in the Queens Tunnel Beneath Woodside, Queens

**Charles Merguerian
Hofstra University**



HOFSTRA UNIVERSITY

Stage 2, City Tunnel 3



Robbins 235-282 HP TBM



Tunneling Difficulties



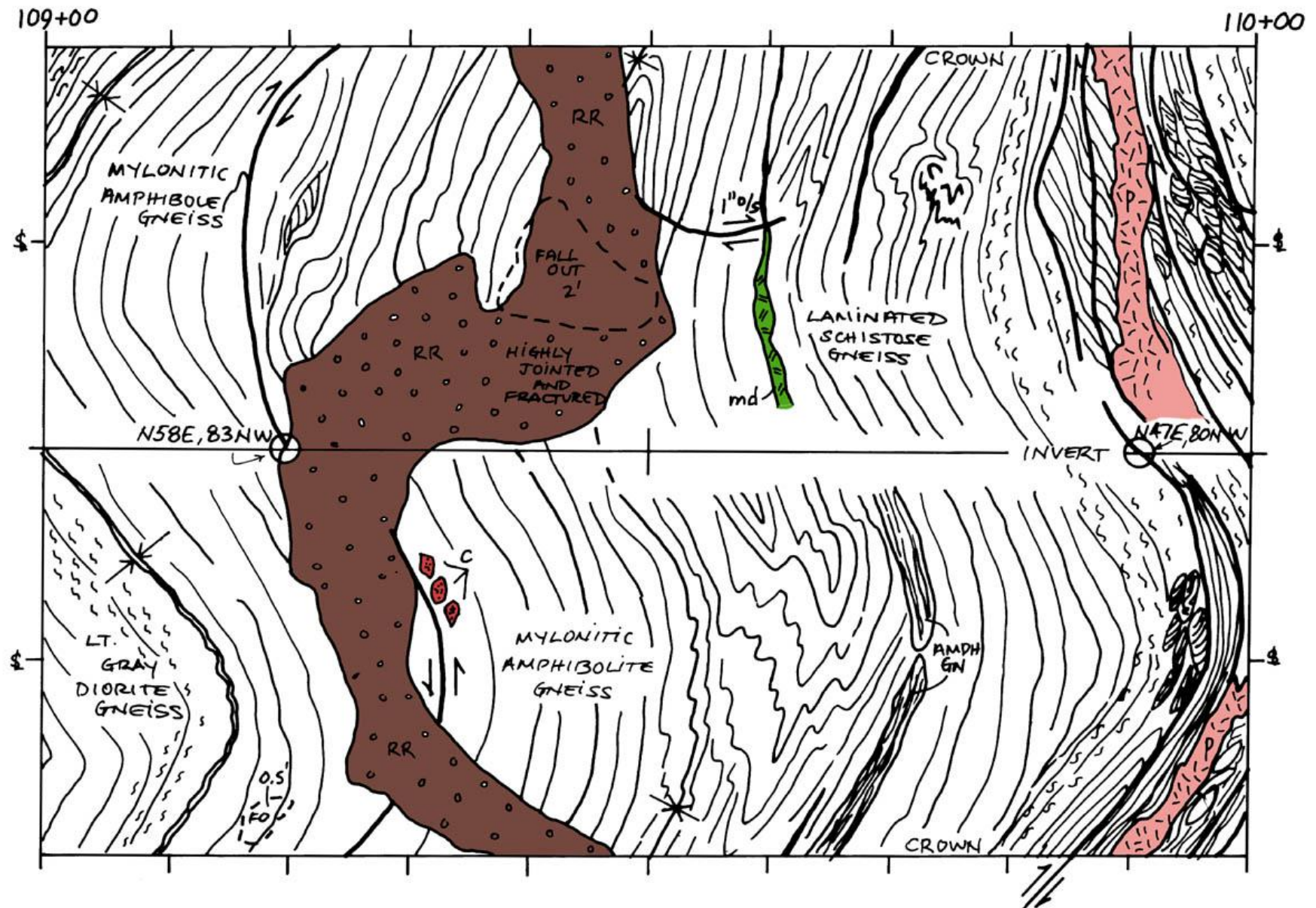
Collapsing Crown



Five Laterally Extensive Dikes

Dike	Stations	Orientation	Exposed		Brief Comments
			Length	Thick- ness	
1	109+20 - 109+52	N65°W, 57°NE	32'	12'	cuts N58°E, 83°NW normal fault
2	117+58 - 118+24	? - RW Only	66'	>8'	cuts N52°E, 76°NW normal fault and shear zone
3	128+70 - 129+21	? - LW Only	51'	7'	cuts D ₃ shear zone
	129+53 - 130+41	N48°W, 78°SW	88'	11'	cuts N20°E, 10°NW thrusts and older F ₃ fold
4	131+70 - 132+42	? - LW Only	72'	6'	cuts N30°W, 23°SW thrust fault
	132+40 - 132+56	? - RW Only	16'	3'	thin selvage cuts thrust fault and shear zone
	132+58 - 133+62	N61°W, 81°NE	104'	5'-10'	cuts N44°E, 83°SE reverse shear zone; fractured
5	149+93 - 151+36	N52°W, 90°	143'	16'	cut by N20°E, 70°NW normal fault; clay-rich gouge
	151+45 - 152+40	N40°W, 83°SW	95'	14'	cut by N18°E, 70°NW normal fault; clay-rich gouge

Dike 1



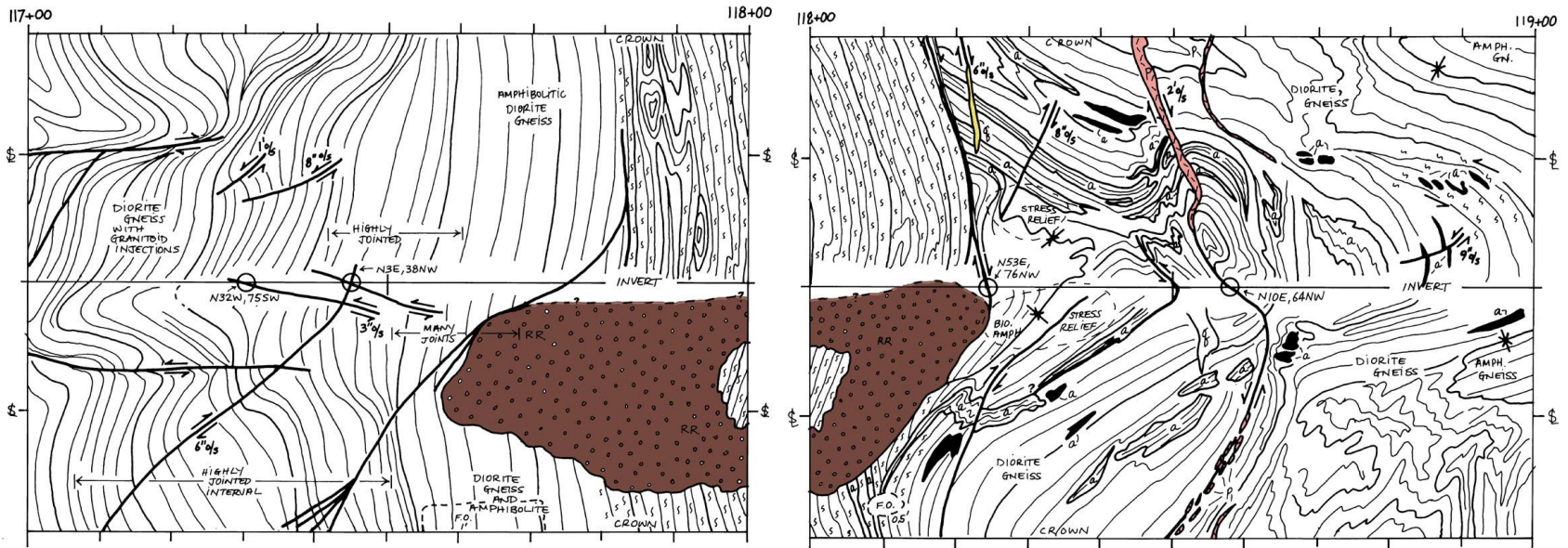


Station 109+20, Right Wall



Cooling joints extend 10' into country rock

Dike 2

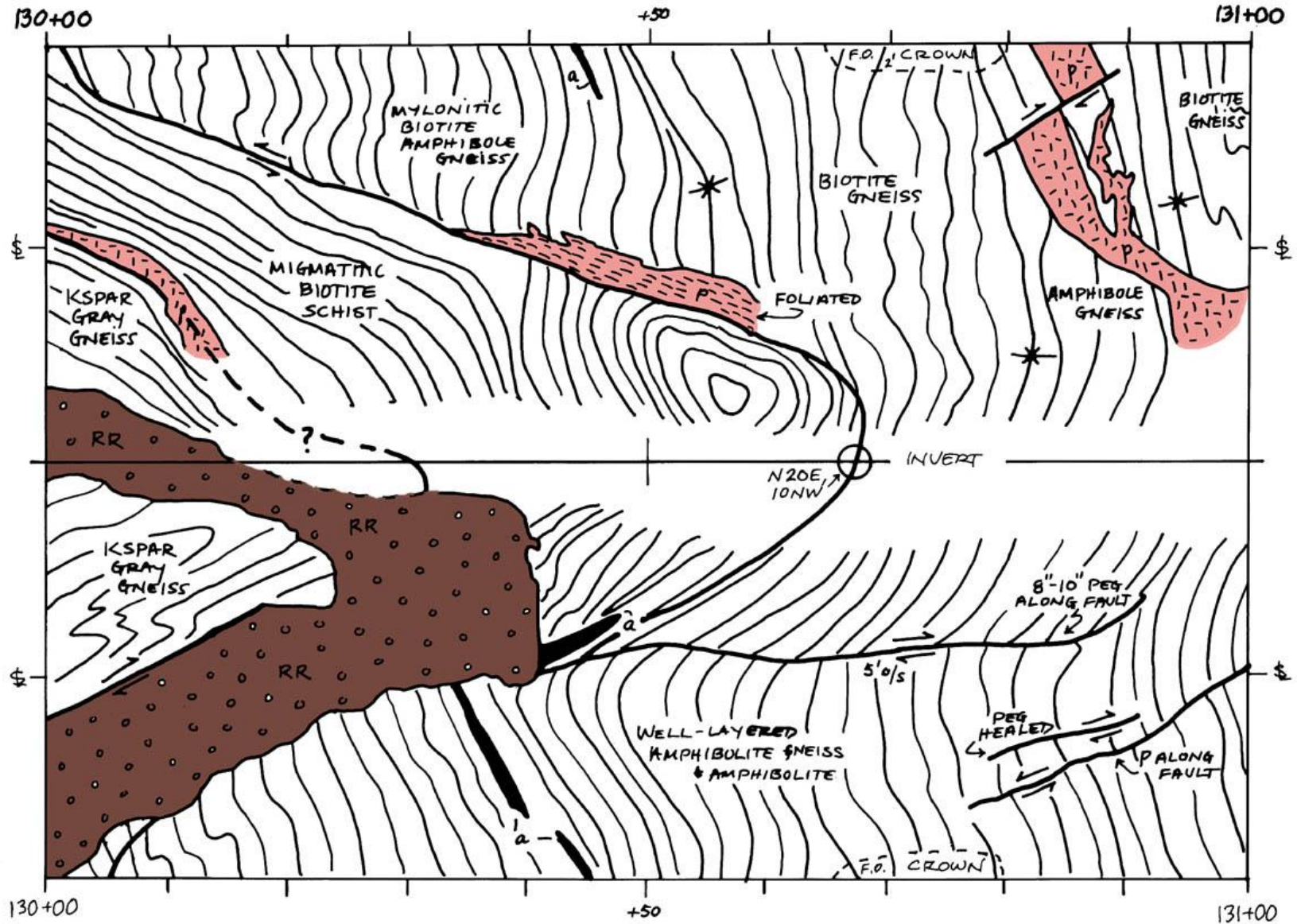






Major Elements	QTR-1	Q01-B	Q02-B	QT Average	Nockolds Rhyodacite
SiO2	64.89	66.16	63.06	64.70	66.27
TiO2	0.58	0.51	0.62	0.57	0.66
Al2O3	14.54	14.83	14.78	14.72	15.39
FeO*	3.73	3.31	4.35	3.80	4.15
MnO	0.07	0.08	0.08	0.08	0.07
MgO	1.62	1.77	2.22	1.87	1.57
CaO	3.97	4.40	5.54	4.64	3.68
Na2O	4.80	5.07	4.48	4.78	4.13
K2O	4.52	3.26	4.35	4.04	3.01
P2O5	0.40	0.41	0.54	0.45	0.17
Total	99.12	99.80	100.01	99.64	99.10
LOI	0.87	3.81	2.86	2.51	0.68
<i>*Total Iron as Fe0</i>					

Dike 3



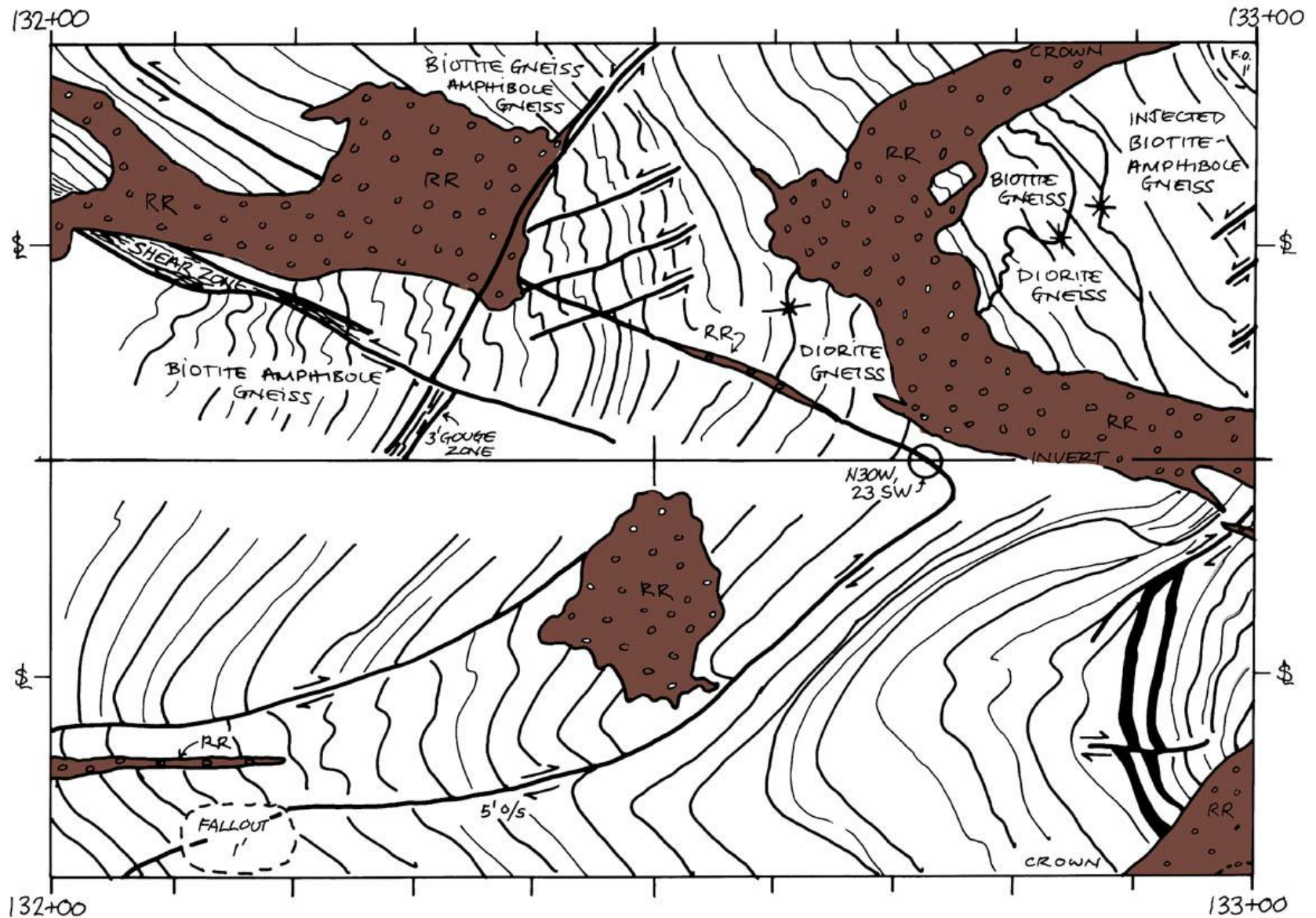
Station 130+40, Right Wall



Multidirectional cooling joints in rhyodacite

The photograph shows a close-up of a reddish-brown rock face with distinct horizontal and vertical jointing patterns. A geological hammer is placed on the right side for scale. Two white arrows point to the joints, which are described as multidirectional cooling joints in rhyodacite.

Dike 4



132+60

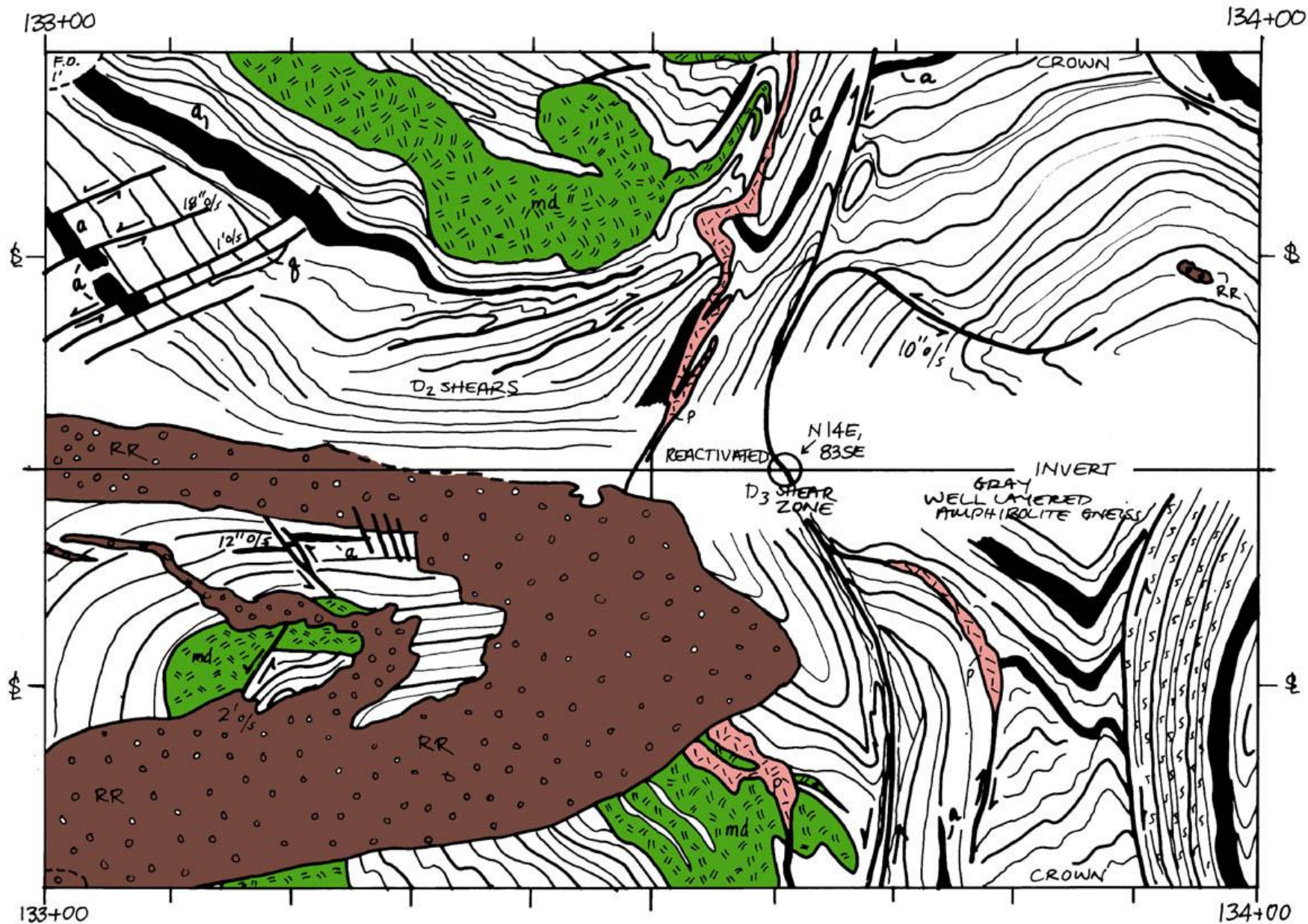
132+65

132+70

132+75

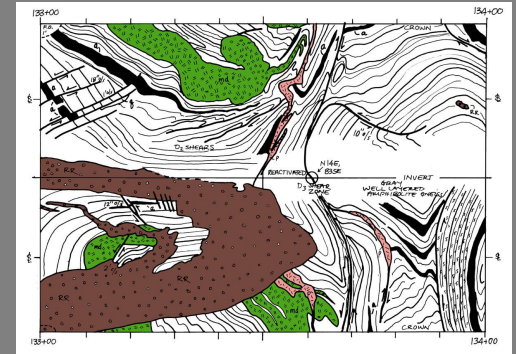
132+80

Dike 4

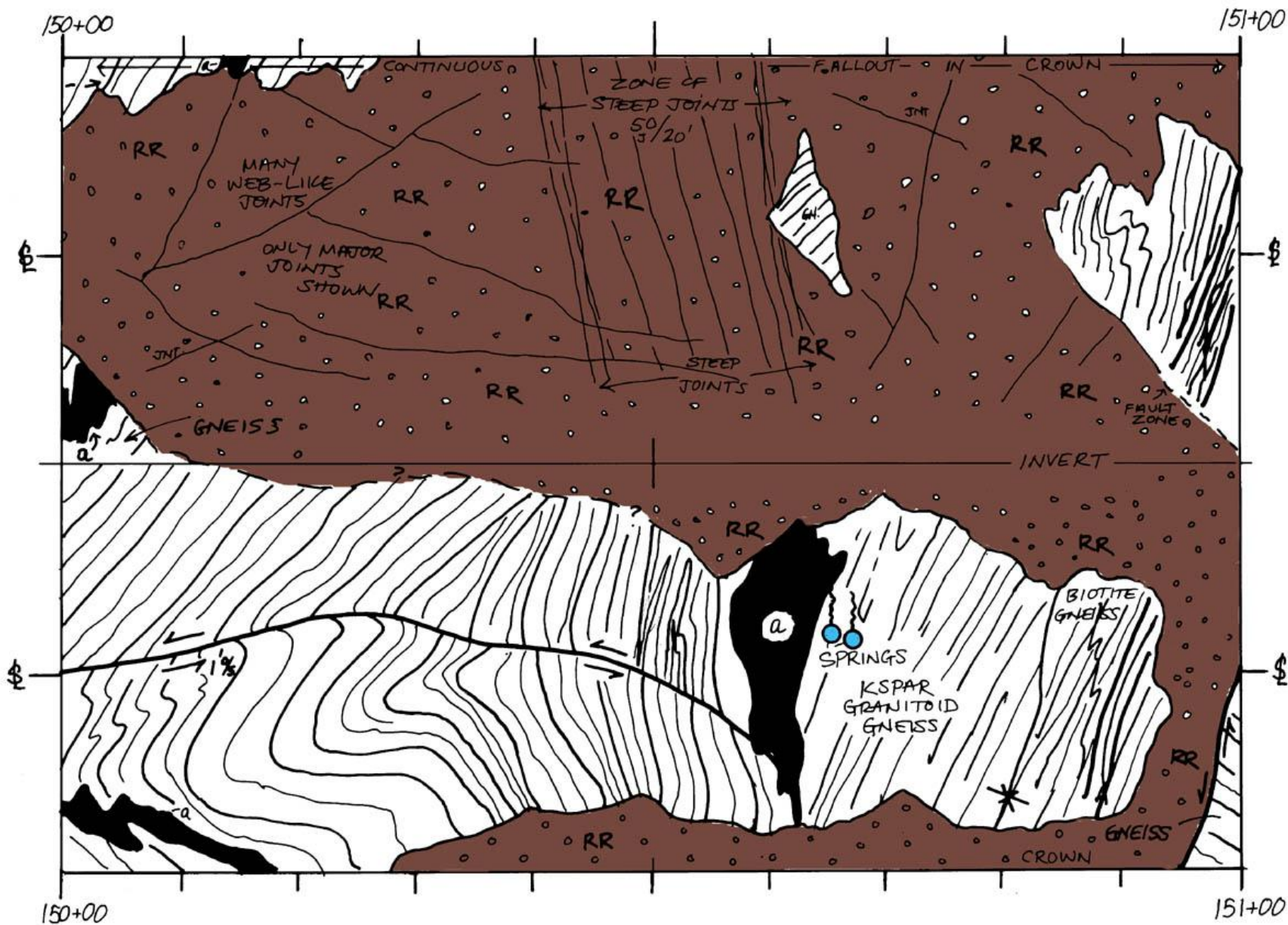




Dike 4

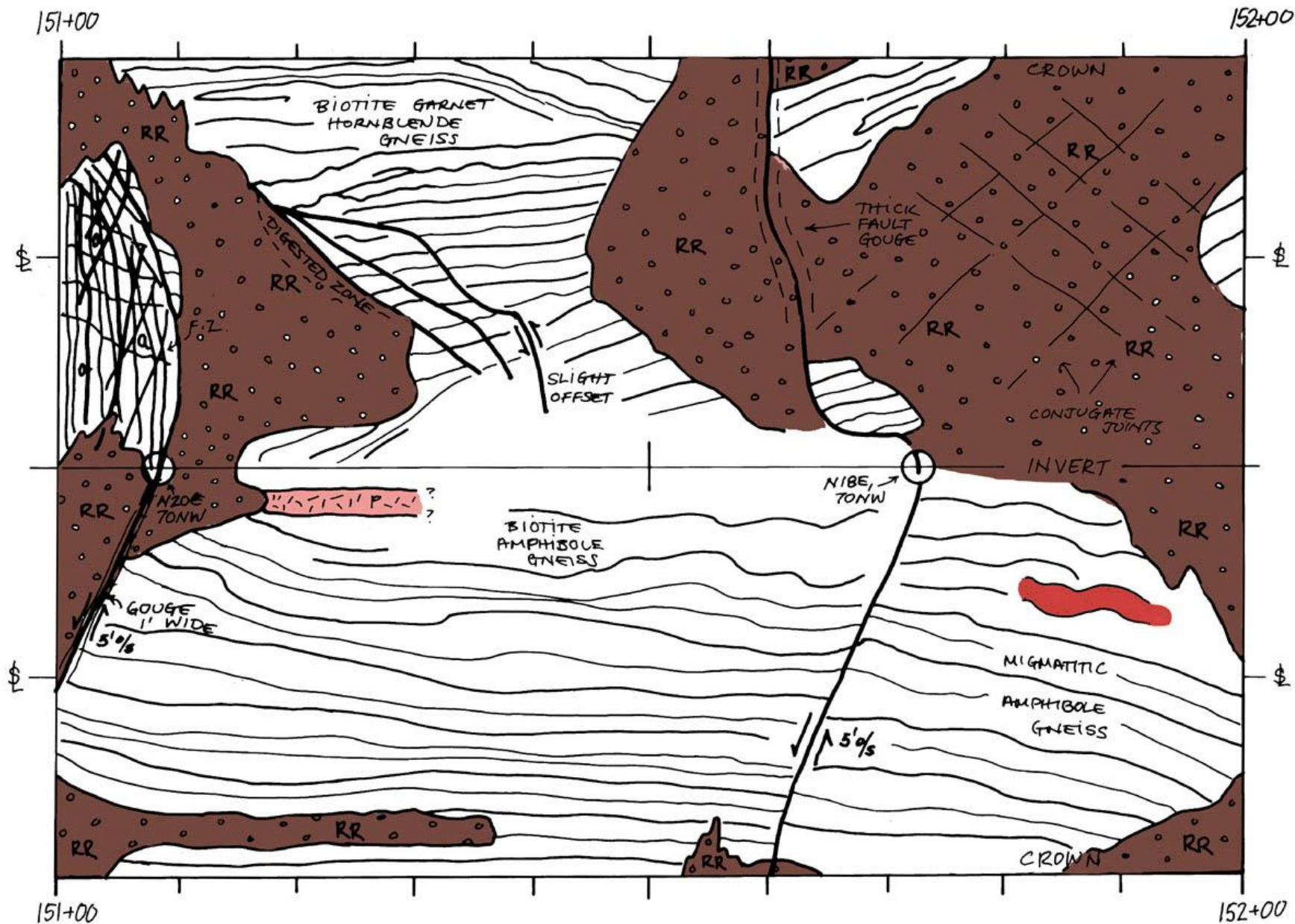


Dike 5

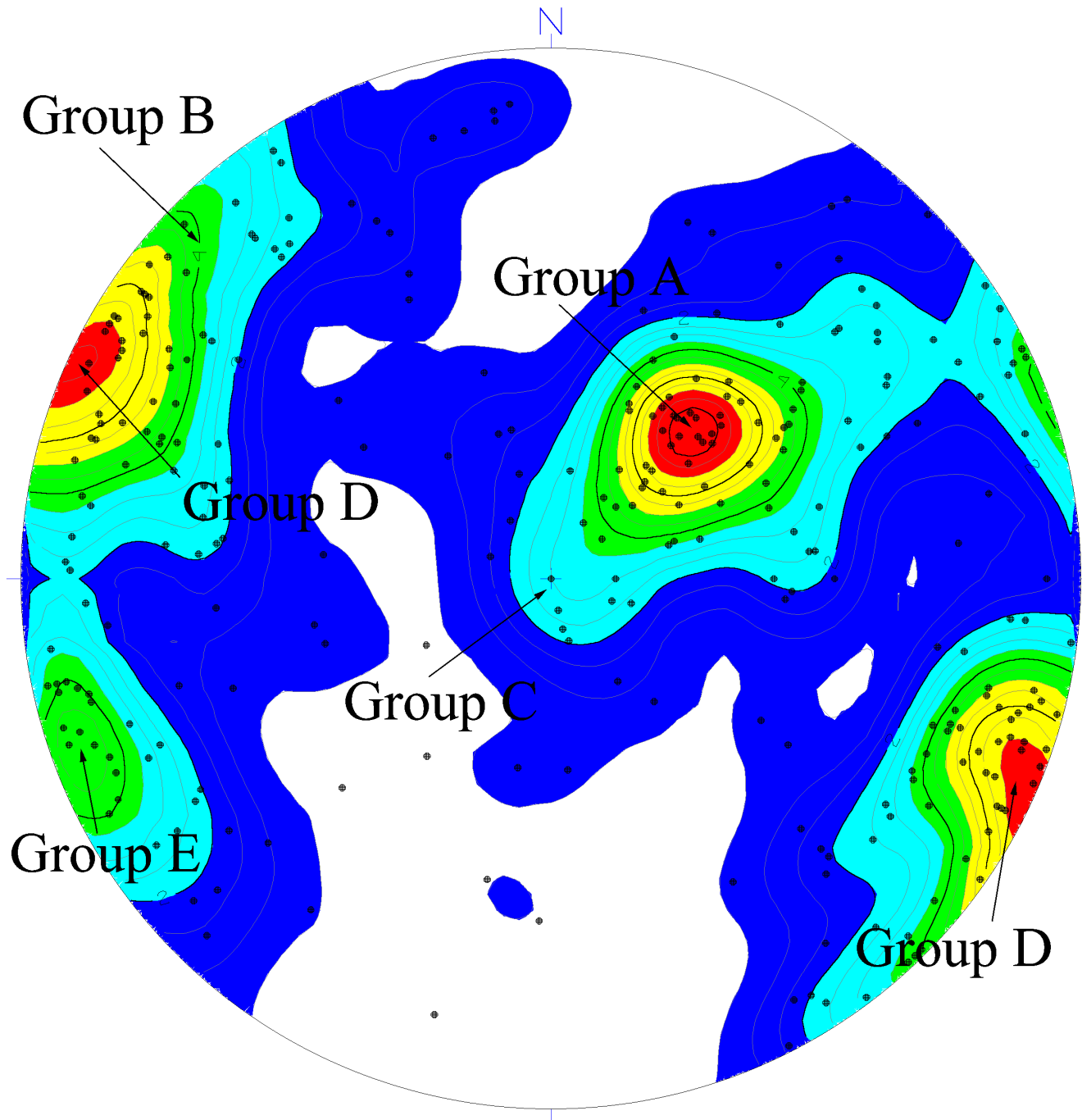


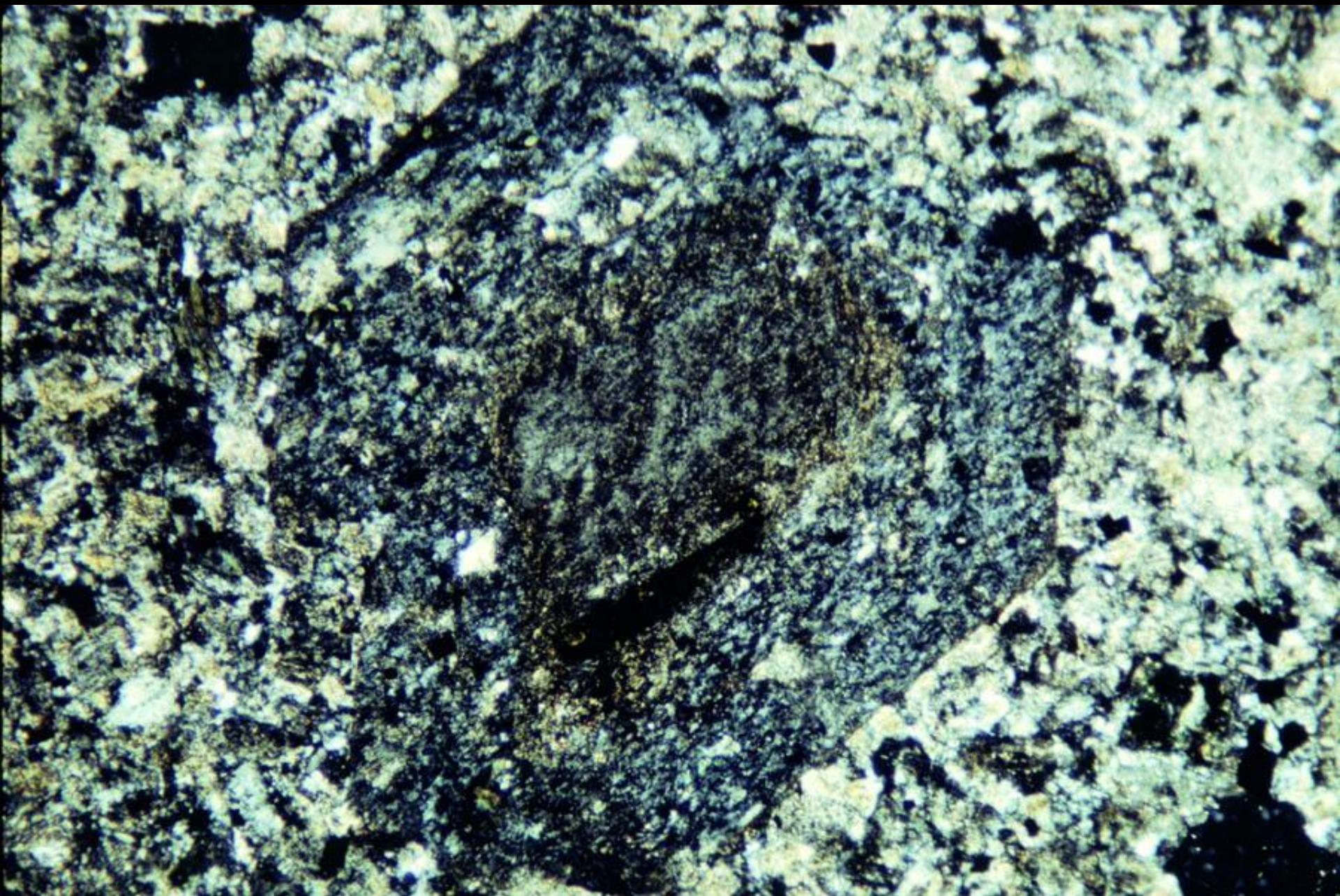


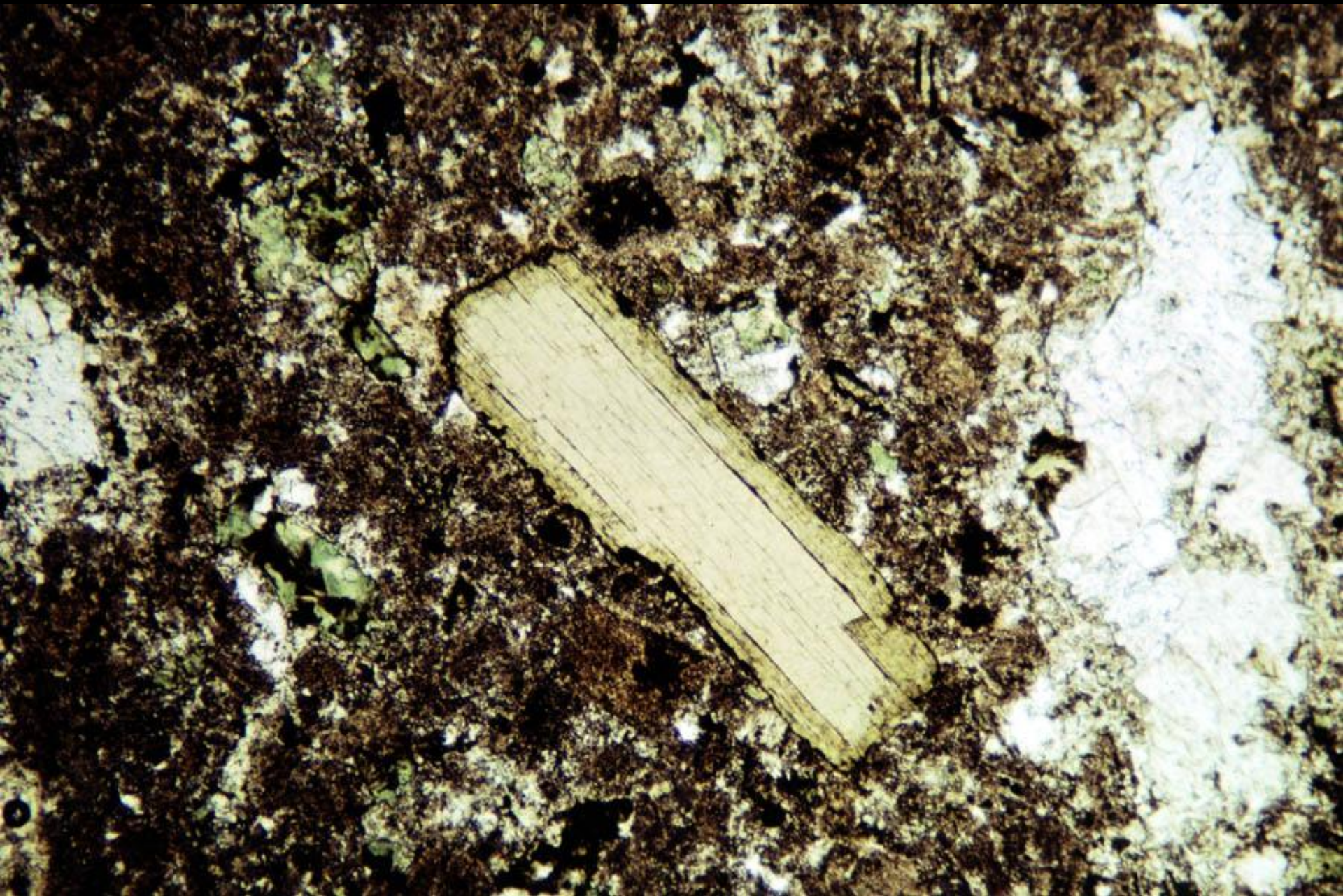
Dike 5

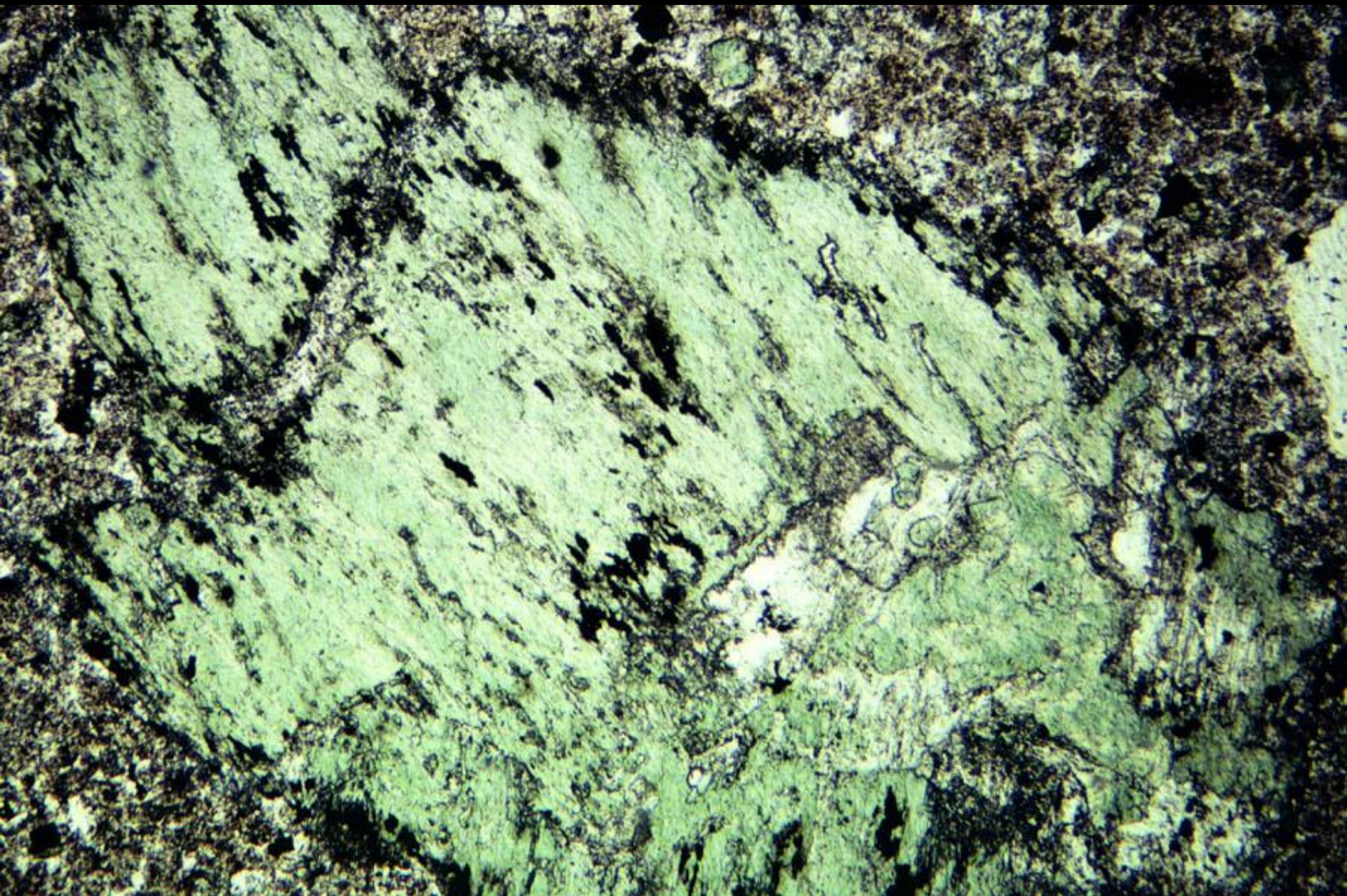


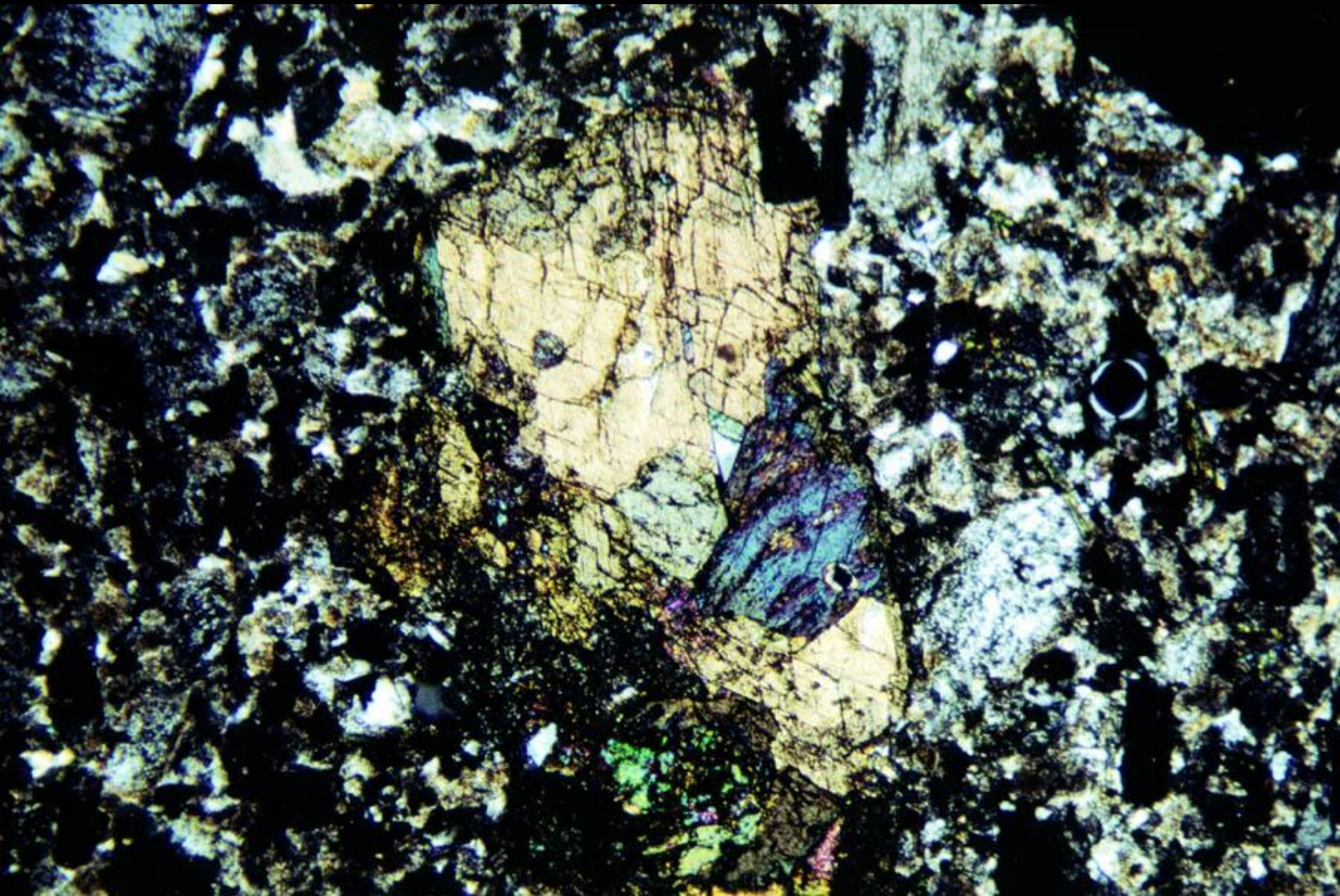
Faults of the Queens Tunnel

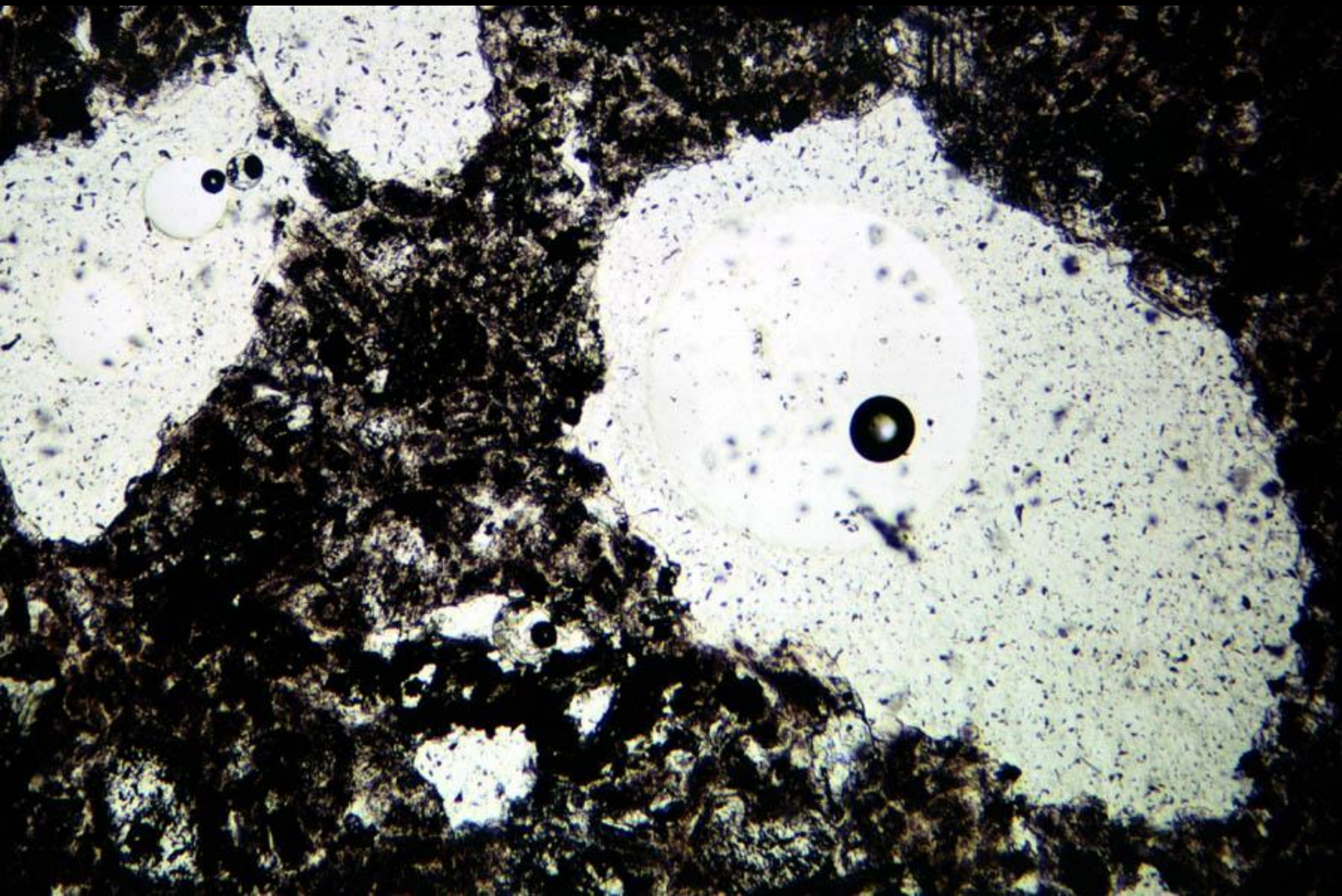












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Lava Flows in Woodside?

