

# PROSPECTING FOR FOXTROT-TYPE VOLCANOGENIC REE DEPOSITS IN LABRADOR

**Randy Miller, V.P. Exploration**



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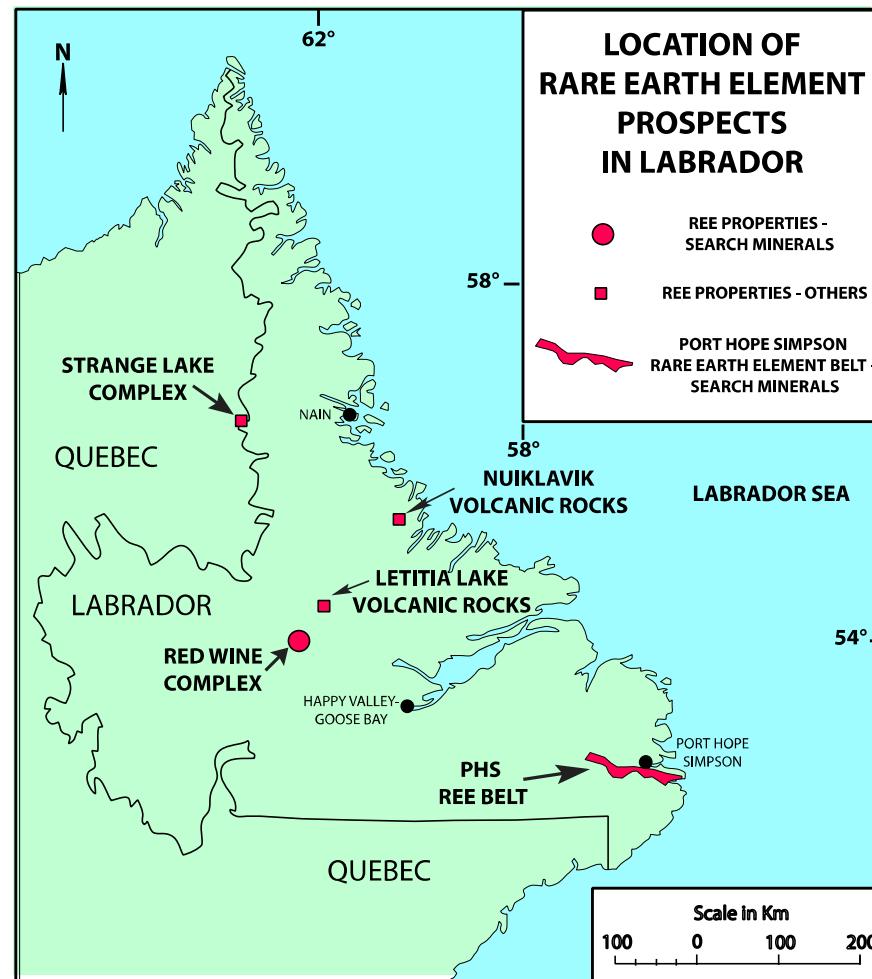
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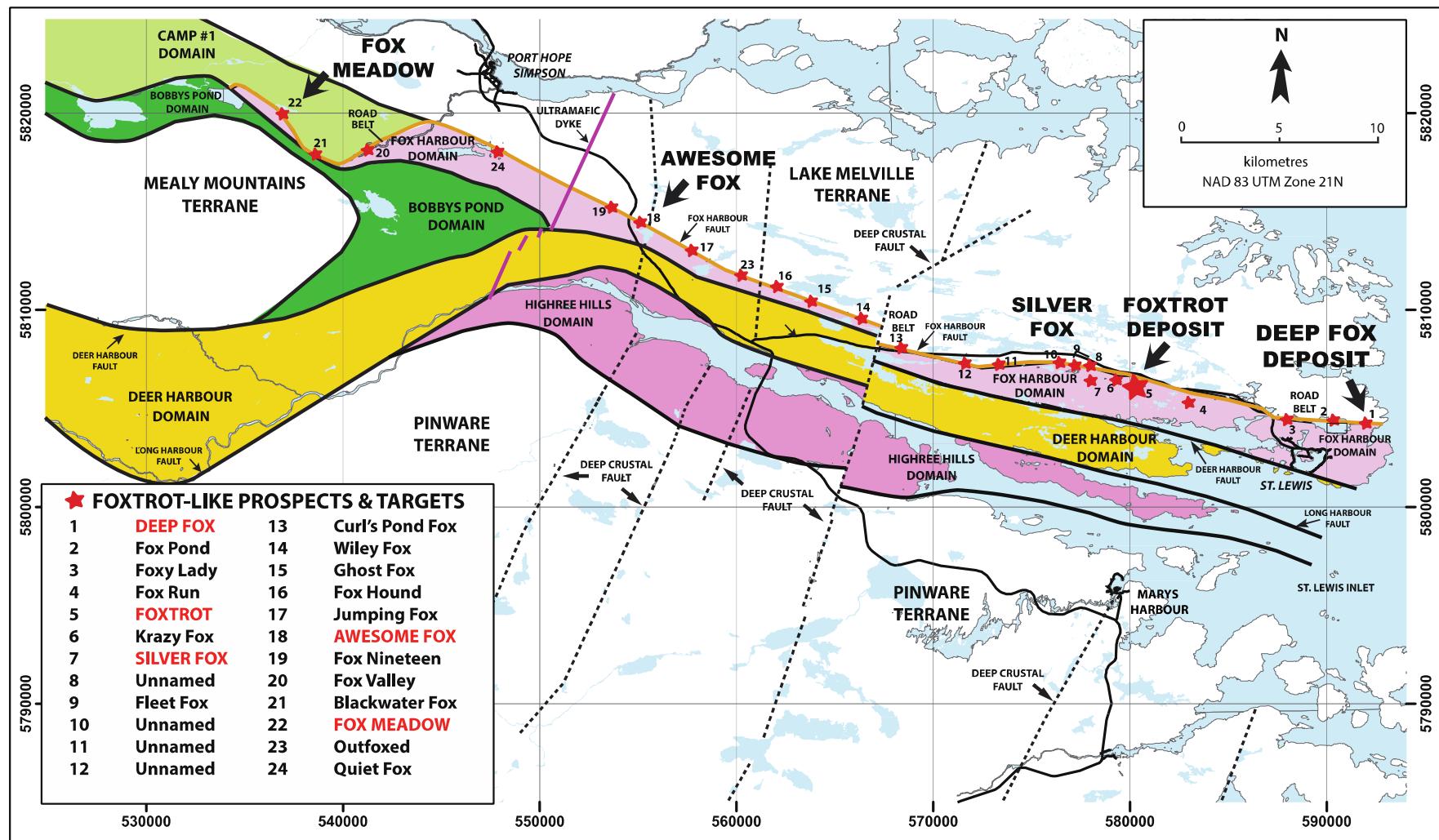
# PRESENTATION INTRODUCTION

- **THE SE LABRADOR REE (Zr-Hf) DISTRICT**
  - TWO RESOURCES: FOXTROT & DEEP FOX
  - FOUR ADVANCED PROJECTS: FOX MEADOW, AWESOME FOX, FOX MEADOW & SILVER FOX
- **WHAT DOES THE MINERALIZATION LOOK LIKE**
  - OUTCROP PHOTOS
  - MINERALOGY, GEOCHEMISTRY
  - MAPS, SECTIONS
- **OUTLINE THE EXPLORATION MODEL DEVELOPED AT FOXTROT**
- **DISCUSS THE CASE FOR A RECENT ANALOGUE IN EAST AFRICAN RIFT**
- **LOOK AT THE SUCCESSFUL EXPLORATION TECHNIQUES**
  - MAGNETIC SURVEYS THEN FOLLOW-UP
  - COMBINED RADIOMETRICS/MAGNETIC DATA & FULL ASSAYS FROM GRAB SAMPLES THEN CHANNELS
- **QUESTIONS**
  - SAMPLES TO LOOK AT

# REE-BEARING PERALKALINE ROCKS IN LABRADOR



# FOXTROT-TYPE PROSPECTS IN SE LABRADOR



# FELSIC PERALKALINE VOLCANIC ROCK NOMENCLATURE

- **COMMENDITE (COM)**
  - $\text{Zr} = \sim 800 \text{ to } 5000 \text{ ppm}$
- **LOW ZIRCONIUM PANTELLERITE (LZP)**
  - $\text{Zr} = 5000 \text{ to } 10,000 \text{ ppm}$
- **PANTELLERITE (PAN)**
  - $\text{Zr} = 10,000 \text{ to } 15,000 \text{ ppm}$
- **HIGH ZIRCONIUM PANTELLERITE (HZP)**
  - $\text{Zr} = 15,000 \text{ to } 25,000 \text{ ppm}$
- **ULTRAHIGH ZIRCONIUM PANTELLERITE (UZP)**
  - $\text{Zr} > 25,000 \text{ ppm}$

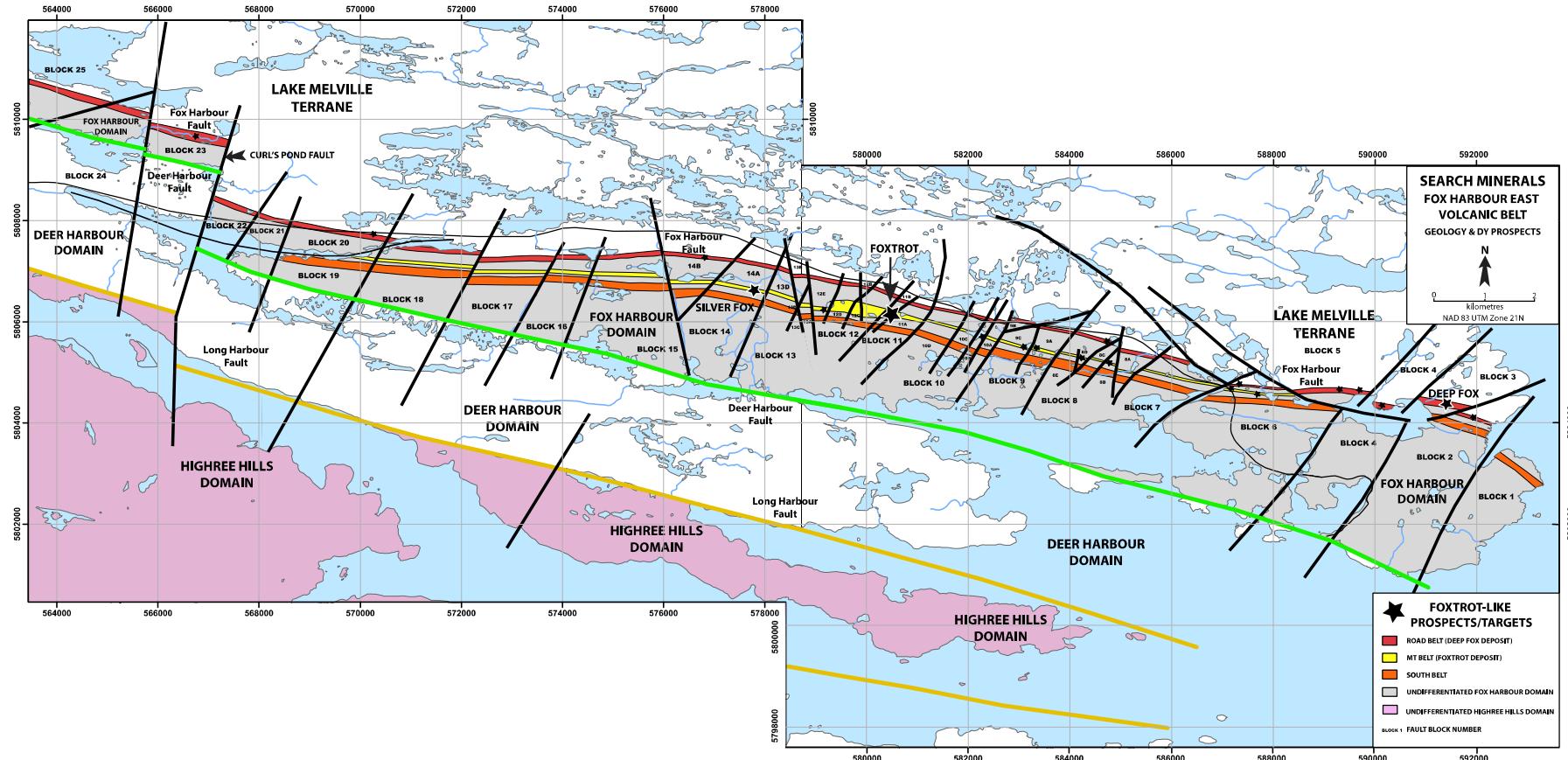
# FOXTROT –AVERAGES FOR REE & SELECTED ELEMENTS

	NONPERALKALINE		PERALKALINE		LZP	PANT	HZP
	NPR	RHYO-DAC	COM	COMTRA			
Y (ppm)	70	40	196	170	676	1115	1293
Zr (ppm)	533	371	1972	1761	5955	11116	18221
Nb (ppm)	40	20	117	111	517	675	586
Hf (ppm)	13	9	46	38	129	238	405
La (ppm)	109	83	273	283	1115	1726	1357
Ce (ppm)	222	167	538	569	2199	3489	2935
Pr (ppm)	25	19	61	66	250	402	345
Nd (ppm)	94	69	221	242	927	1508	1315
Sm (ppm)	17	12	44	45	167	274	261
Eu (ppm)	1	2	2	4	8	13	11
Gd (ppm)	14	9	37	36	132	218	221
Tb (ppm)	2	1	6	6	21	35	39
Dy (ppm)	13	8	37	34	121	202	239
Ho (ppm)	3	2	7	7	23	39	48
Er (ppm)	8	4	21	18	66	111	138
Tm (ppm)	1	1	3	3	10	16	21
Yb (ppm)	8	4	20	17	62	99	131
Lu (ppm)	1	1	3	3	9	15	20
LREE (ppm)	467	350	1135	1205	4659	7399	6213
HREE	50	31	135	127	447	748	869
HREE + Y (ppm)	119	70	331	298	1263	1864	2162
TREE (ppm)	517	381	1271	1332	5107	8148	7082
TREE + Y (ppm)	587	420	1467	1503	5783	9263	8374
%TREE (%)	0.05	0.04	0.13	0.13	0.51	0.82	0.71
%TREE + y (%)	0.06	0.04	0.15	0.15	0.58	0.93	0.84
%HREE (%)	0.01	0.00	0.01	0.01	0.05	0.08	0.09
%HREE + Y (%)	0.01	0.01	0.03	0.03	0.11	0.19	0.22
No. Of Samples used for Avg	507	1947	2579	155	1263	1117	84

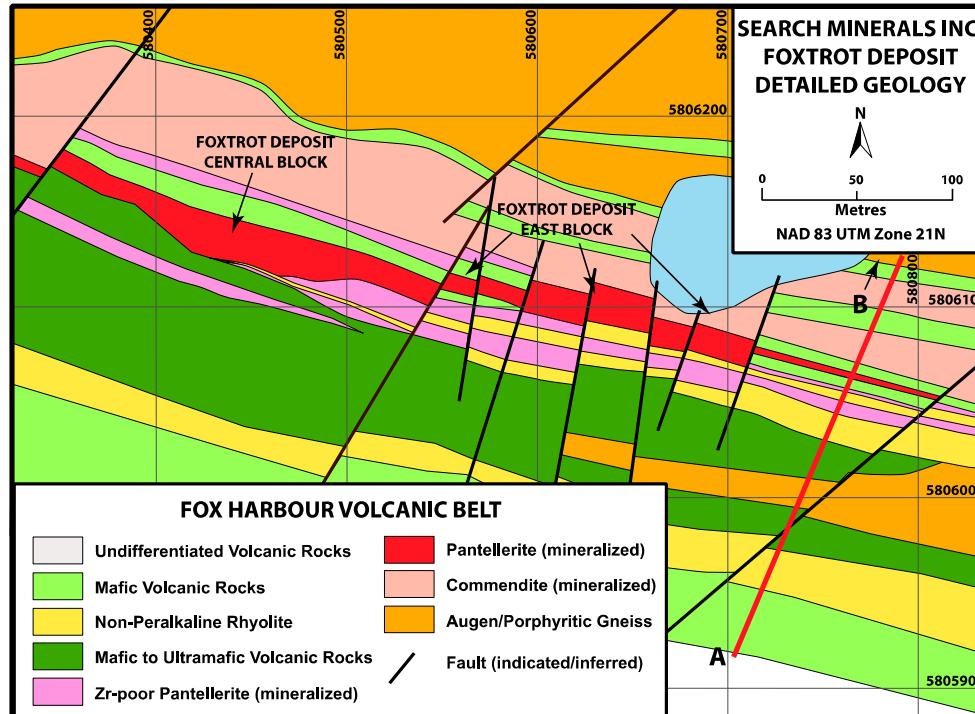
# DEEP FOX –AVERAGES FOR REE & SELECTED ELEMENTS

	NONPERALKALINE		PERALKALINE				
	NPR	RHYO-DAC	COM	COMTRA	LZP	PANT	HZP
Y (ppm)	75	53	186	175	779	1302	1331
Zr (ppm)	539	349	1895	2010	7147	12570	17240
Nb (ppm)	35	24	100	97	502	664	611
Hf (ppm)	13	8	40	40	154	271	373
La (ppm)	105	75	318	327	1326	2064	1797
Ce (ppm)	215	152	654	697	2625	4208	3870
Pr (ppm)	25	17	77	82	303	489	463
Nd (ppm)	92	64	283	312	1100	1818	1769
Sm (ppm)	17	12	52	56	199	334	340
Eu (ppm)	1	2	4	5	10	17	17
Gd (ppm)	14	9	40	42	154	260	273
Tb (ppm)	2	2	6	6	25	42	45
Dy (ppm)	14	9	38	37	145	248	273
Ho (ppm)	3	2	7	7	28	47	53
Er (ppm)	8	6	20	20	78	132	149
Tm (ppm)	1	1	3	3	11	18	21
Yb (ppm)	8	6	18	18	68	113	129
Lu (ppm)	1	1	3	3	10	16	19
LREE (ppm)	454	320	1383	1474	5564	8913	8239
HREE	51	37	139	141	529	894	979
HREE + Y (ppm)	126	90	325	316	1308	2196	2310
TREE (ppm)	506	356	1521	1615	6092	9806	9219
TREE + Y (ppm)	580	409	1708	1791	6871	11009	10550
%TREE (%)	0.05	0.04	0.15	0.16	0.61	0.98	0.92
%TREE + y (%)	0.06	0.04	0.17	0.18	0.69	1.11	1.05
%HREE (%)	0.01	0.00	0.01	0.01	0.05	0.09	0.10
%HREE + Y (%)	0.01	0.01	0.03	0.03	0.13	0.22	0.23
No. Of Samples used for Avg	615	563	963	513	460	974	356

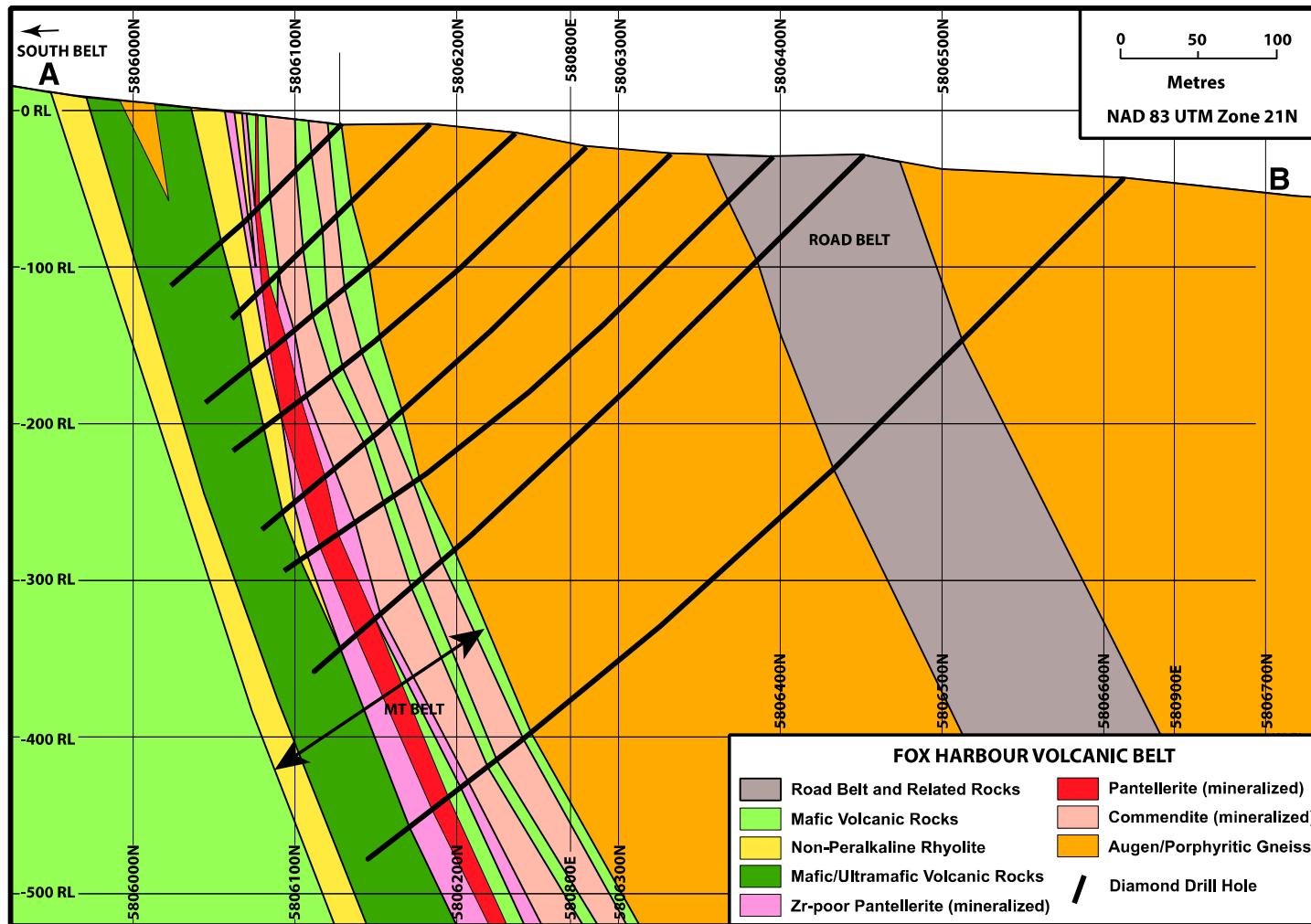
# FOX HARBOUR VOLCANIC BELT EAST - GEOLOGY



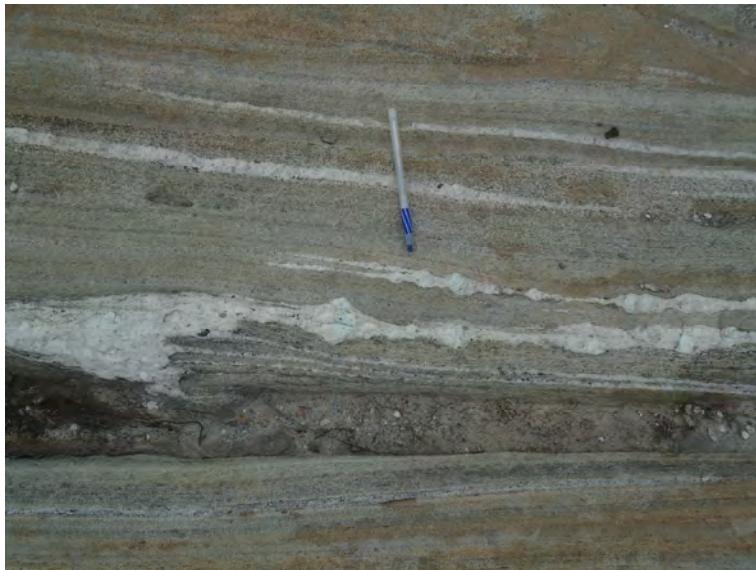
# FOXTROT – DETAILED GEOLOGY



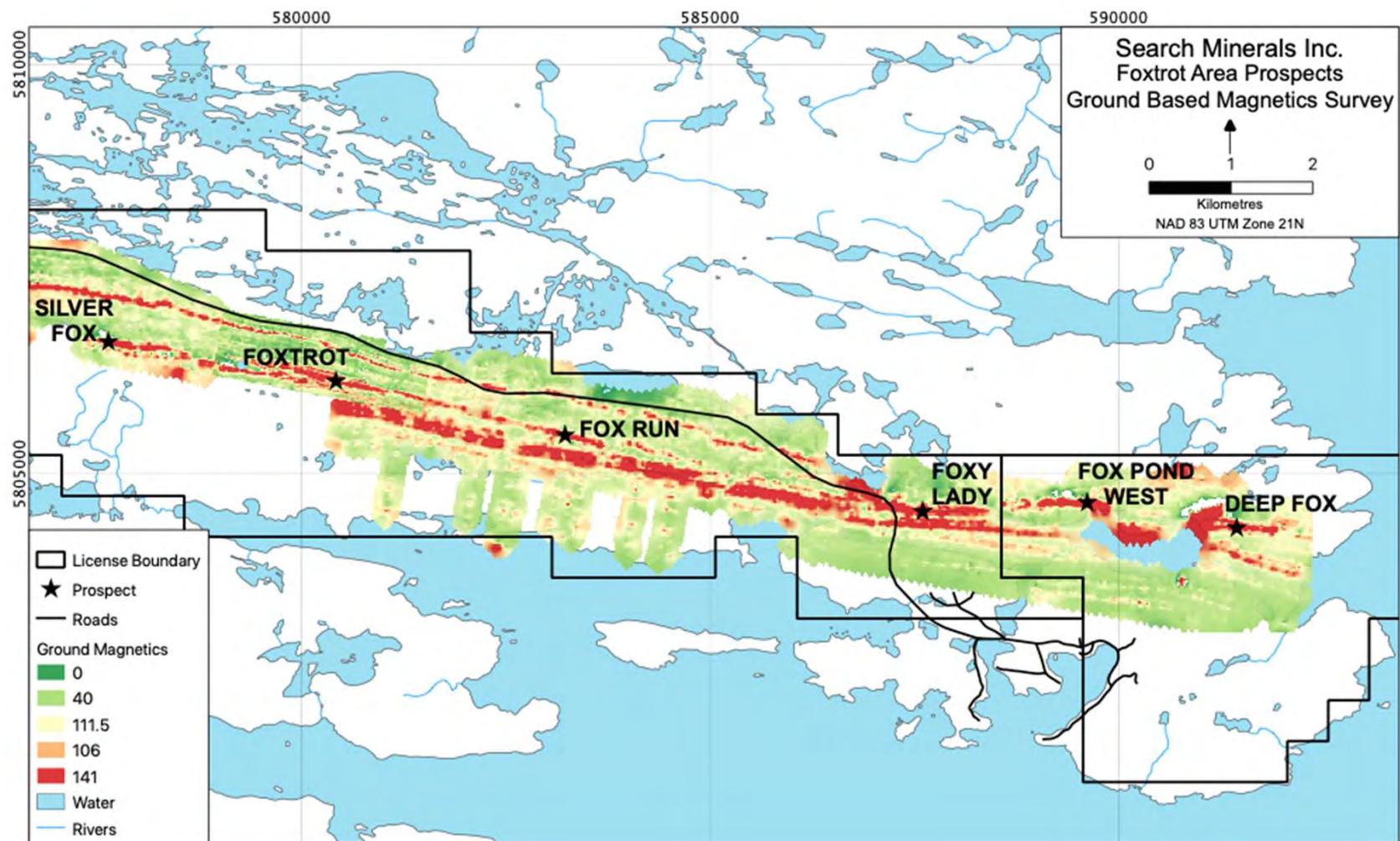
# FOXTROT – NORTH SOUTH CROSS SECTION



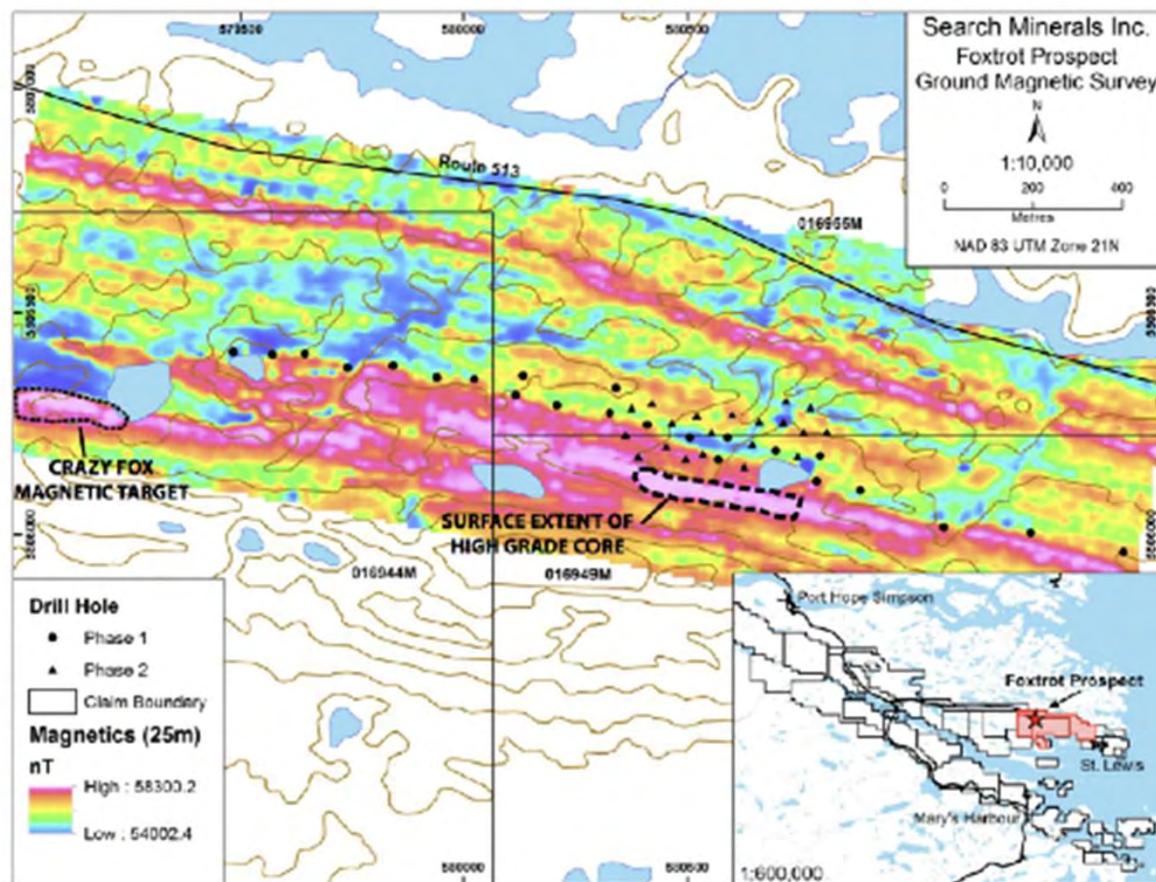
## FOXTROT – MINERALIZED PANTELLERITE OUTCROP



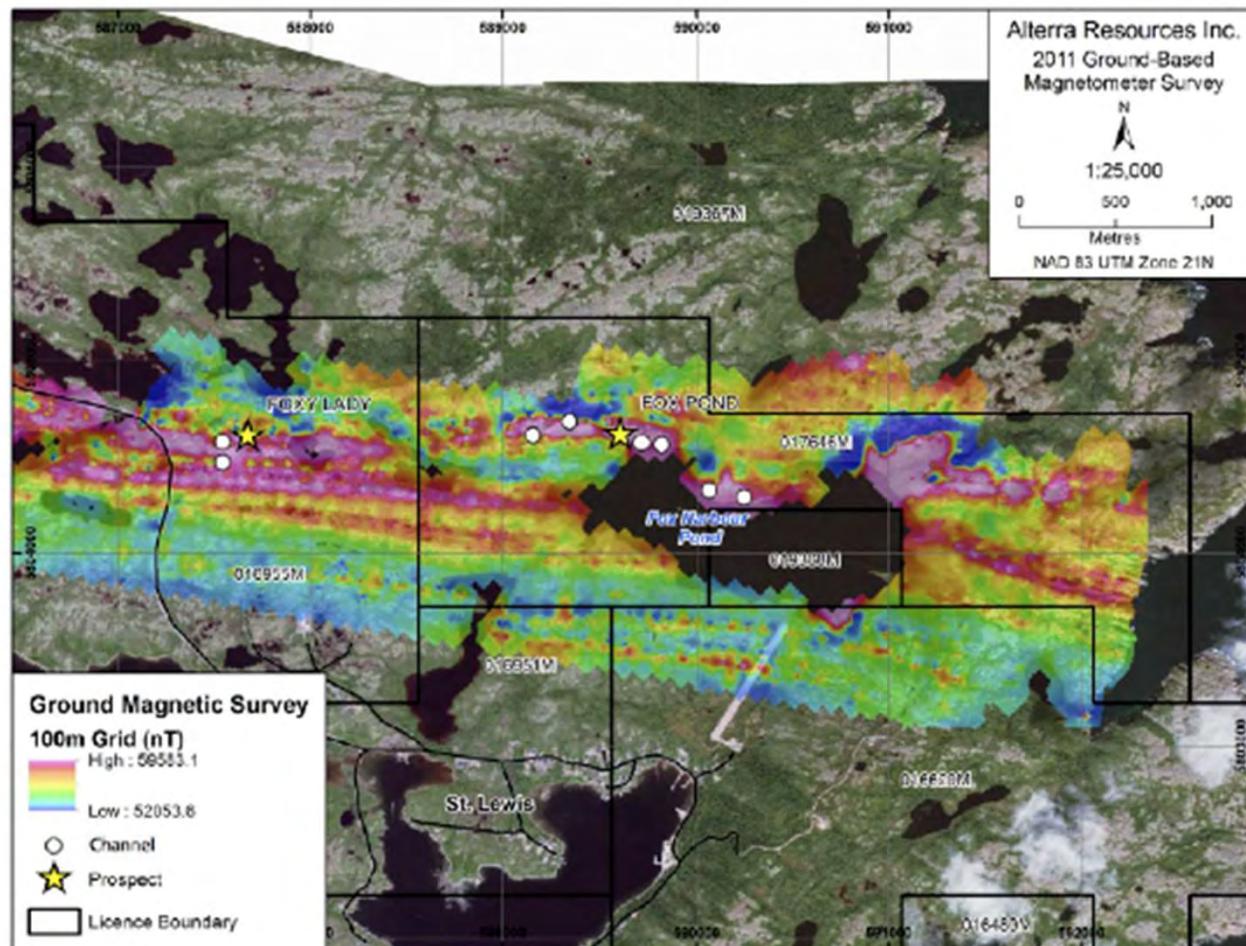
## FOX HARBOUR VOLCANIC BELT EAST – GROUND MAG



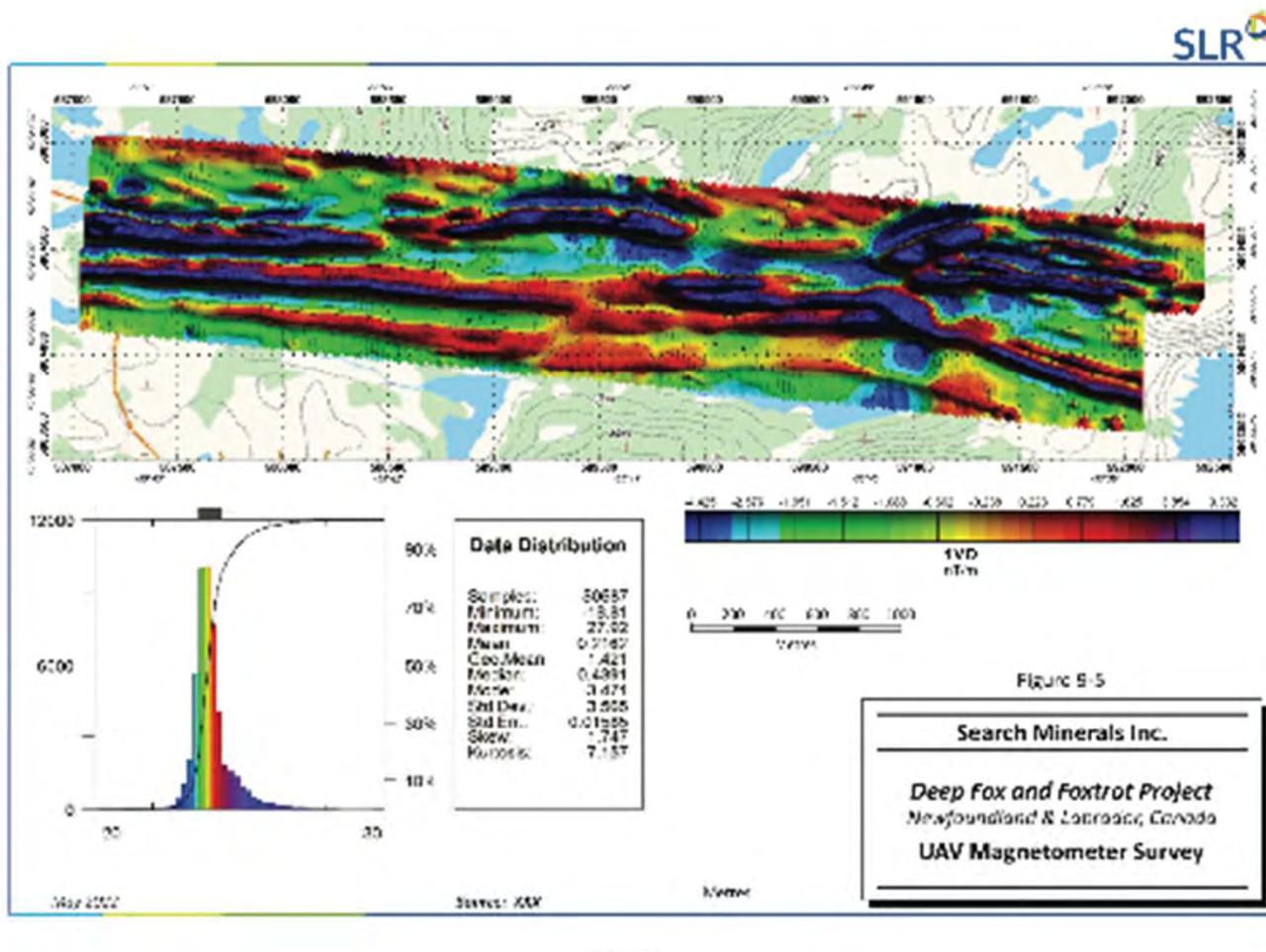
# FOXTROT DETAILED GROUND MAG SURVEY



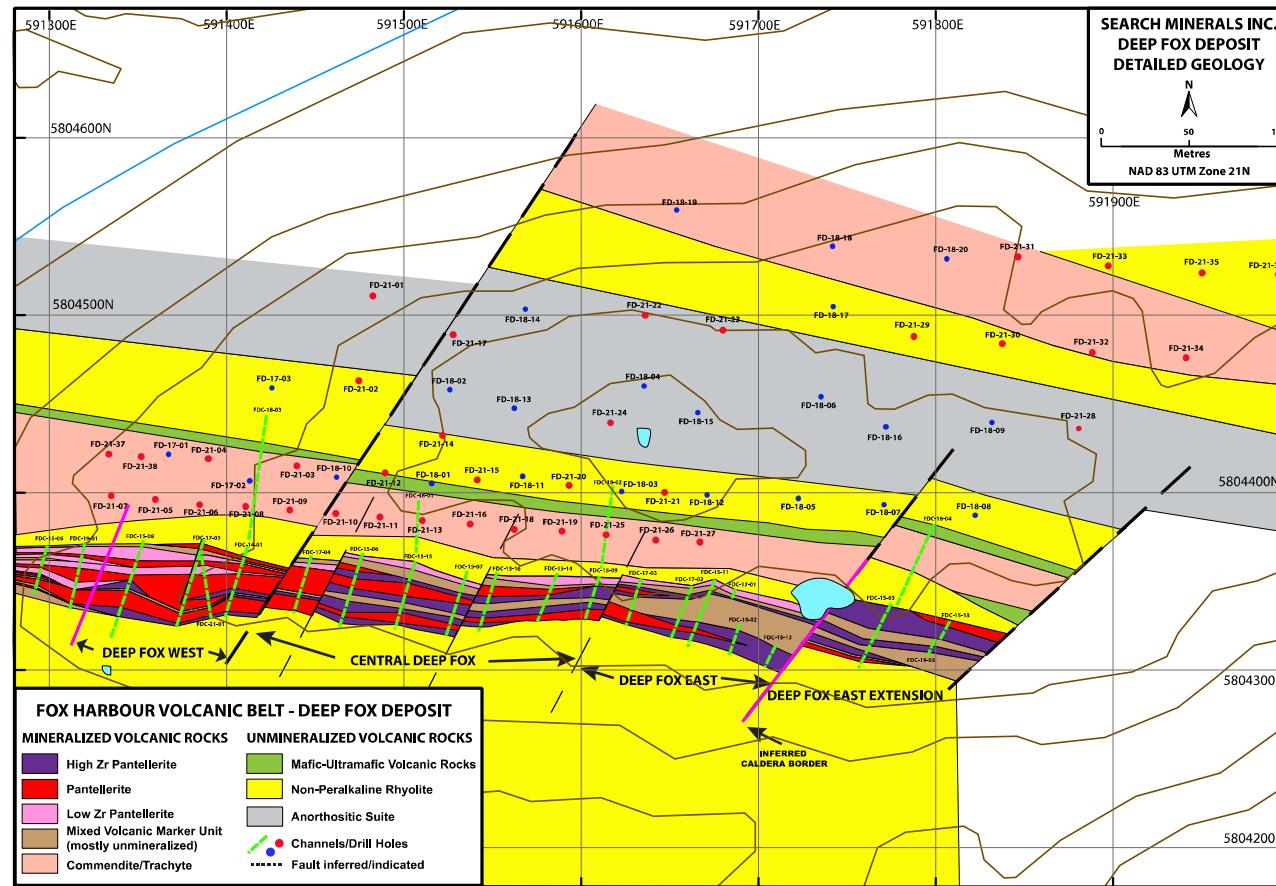
## DEEP FOX – FOXY LADY GROUND MAGNETIC SURVEY



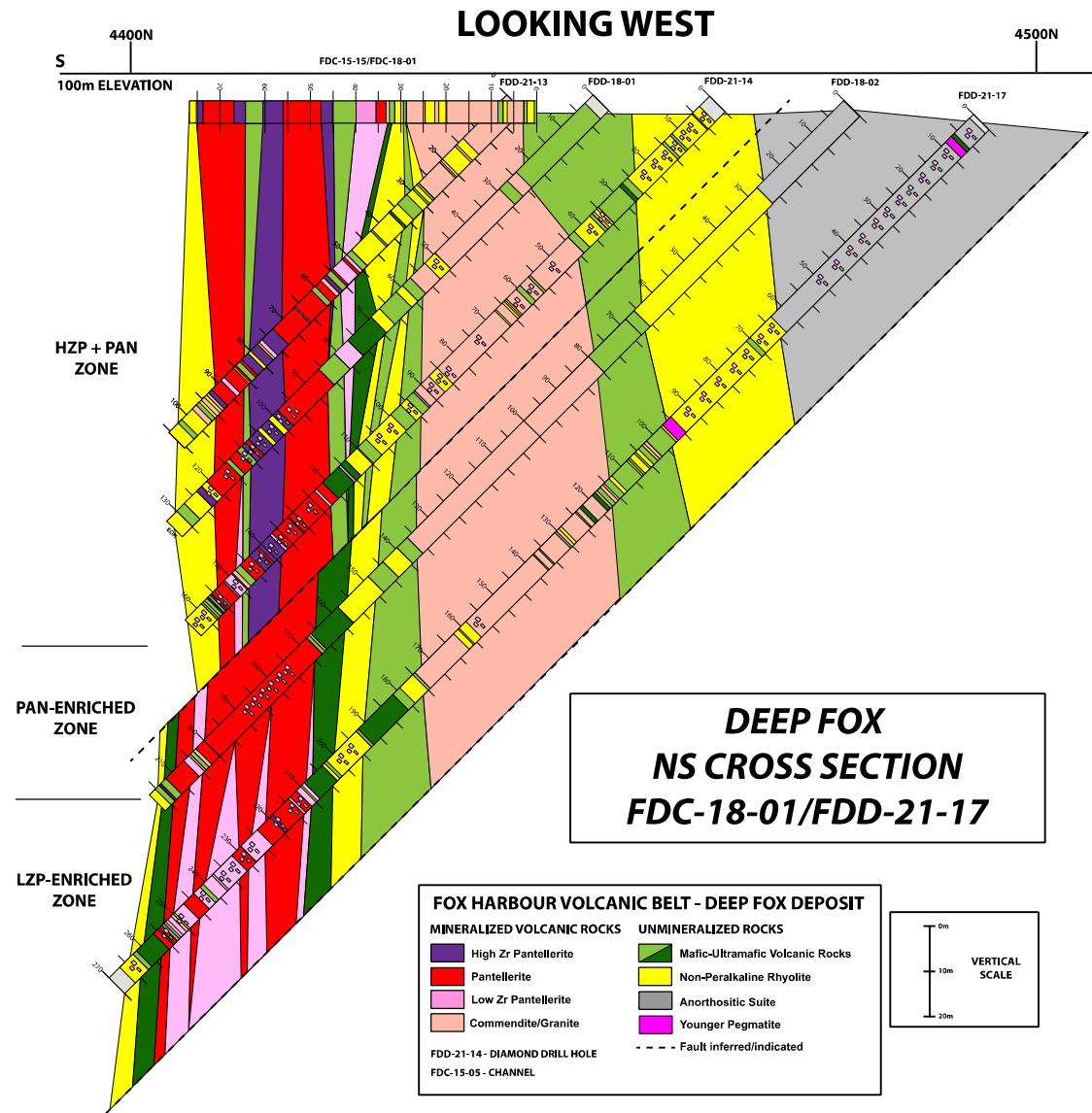
## FOX HARBOUR VOLCANIC BELT EAST – DRONE MAG



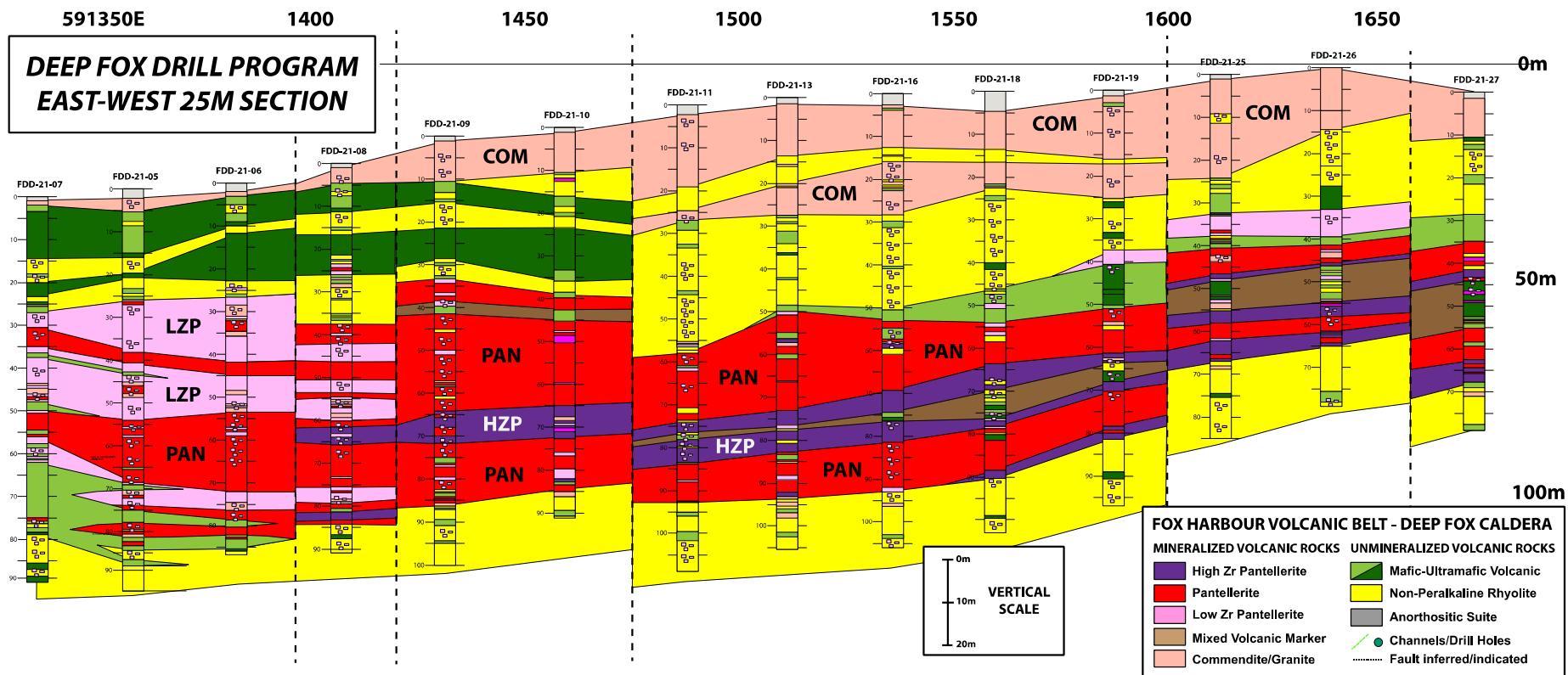
# DEEP FOX – GEOLOGY & DDH (2021)



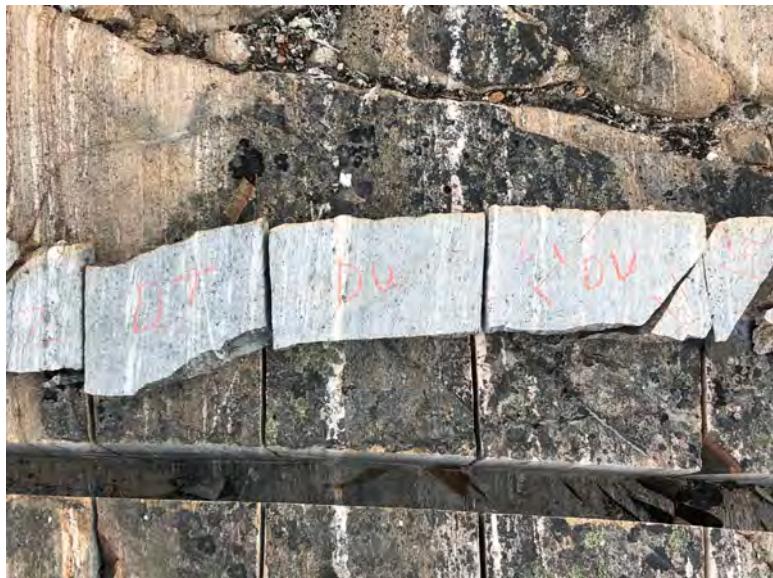
# DEEP FOX NORTH SOUTH CROSS SECTION



# DEEP FOX 25M EW CROSS SECTION



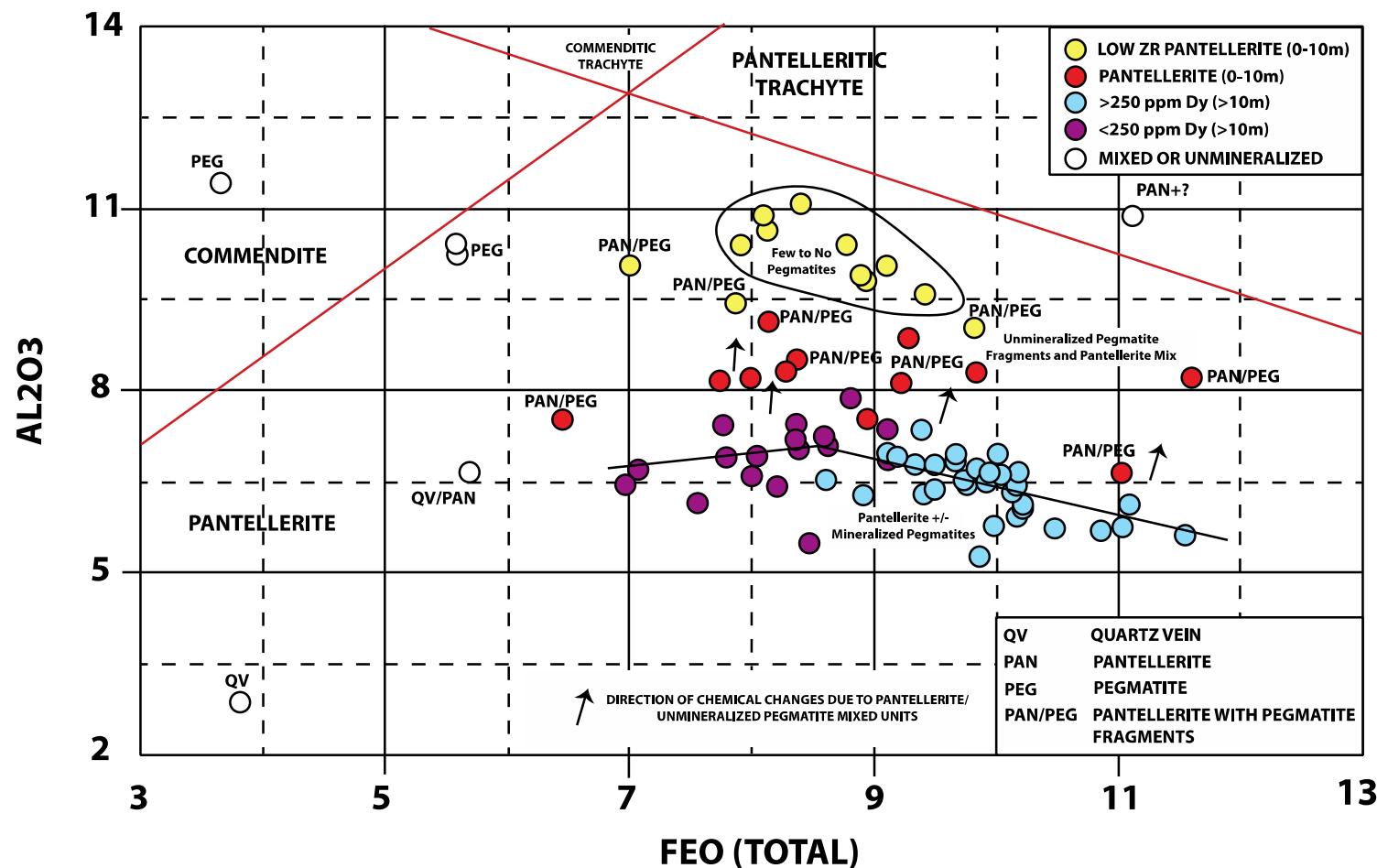
## DEEP FOX – MINERALIZED PANTELLERITE OUTCROP



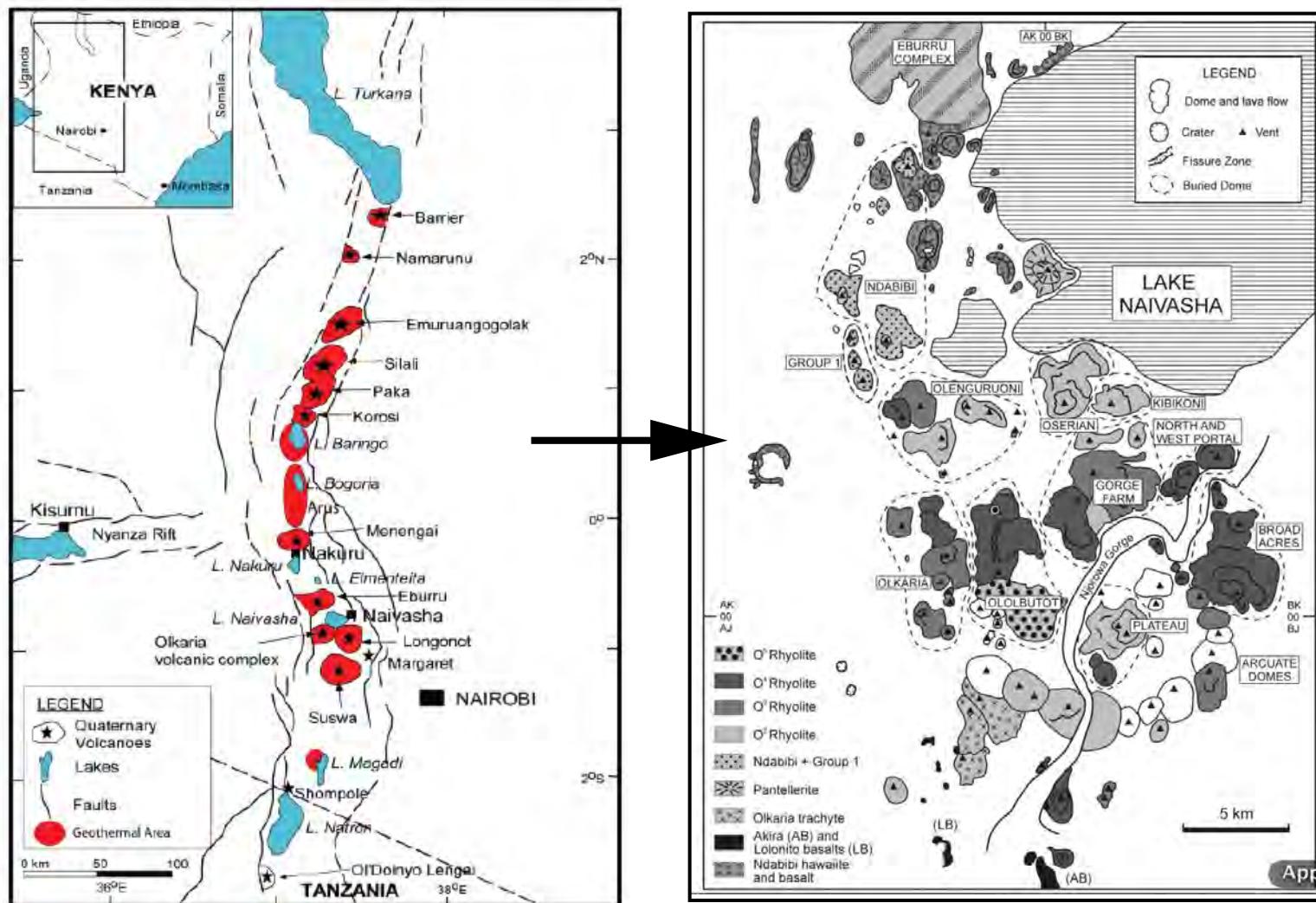
DEEP FOX PHASE 3 (25m to 100m LEVEL)						
LEVEL	25m	25m	50m	50m	100m	100m
DRILL HOLE	FD-21-09	FD-21-09	FD-21-15	FD-21-15	FD-21-02	FD-21-02
FROM	41.44	66.86	92.17	94.16	137.31	153.76
TO	75.07	73.92	122.85	104.45	174.13	160.95
TRUE WIDTH	26.90	5.65	24.54	8.23	29.46	5.75
Y (ppm)	1,343	1,613	1,197	1,551	1,095	1,328
Zr (ppm)	12,289	15,318	12,133	15,272	10,225	13,138
Nb (ppm)	755	791	609	813	586	688
La (ppm)	2,170	2,538	1,773	2,254	1,920	2,587
Ce (ppm)	4,388	5,249	3,700	4,782	3,820	5,053
Pr (ppm)	520	630	444	578	444	588
Nd (ppm)	1,942	2,405	1,671	2,191	1,648	2,190
Sm (ppm)	358	455	311	412	296	392
Eu (ppm)	17.9	22.7	15.8	20.9	15.1	19.9
Gd (ppm)	268	336	237	313	227	295
Tb (ppm)	43.3	55.9	39.6	52.3	36.2	46.0
Dy (ppm)	254	327	239	315	210	263
Ho (ppm)	48.3	62.1	45.3	59.8	39.6	48.6
Er (ppm)	134	172	127	166	110	134
Tm (ppm)	18.1	23.2	17.3	22.5	15.2	18.1
Yb (ppm)	112	142	108	138	93	110
Lu (ppm)	16.2	20.3	15.2	19.5	13.2	15.5

DEEP FOX PHASE 3 (150m to 200m LEVEL)						
LEVEL	150m	150m	150m	200m	200m	200m
DRILL HOLE	FD-21-29	FD-21-30	FD-21-30	FD-21-31	FD-21-33	FD-21-33
FROM	297.70	210.38	226.75	408.56	315.52	326.92
TO	317.91	258.28	241.80	433.11	336.20	331.97
TRUE WIDTH	16.17	38.32	12.04	19.64	16.54	4.04
Y (ppm)	1,320	1,178	1,488	1,128	1,386	1,617
Zr (ppm)	12,396	12,500	15,152	13,403	14,975	17,708
Nb (ppm)	598	547	634	532	634	705
La (ppm)	2,023	1,707	2,155	1,667	1,968	2,209
Ce (ppm)	4,101	3,686	4,647	3,430	4,121	4,649
Pr (ppm)	496	434	555	419	499	568
Nd (ppm)	1,863	1,644	2,099	1,596	1,912	2,194
Sm (ppm)	337	312	397	296	363	423
Eu (ppm)	17.6	16.0	20.2	15.0	18.3	21.3
Gd (ppm)	265	242	311	237	289	337
Tb (ppm)	43.5	39.2	50.7	39.2	48.1	58.2
Dy (ppm)	265	240	309	240	284	348
Ho (ppm)	49.5	44.3	57.2	46.0	55.2	67.5
Er (ppm)	137	123	158	128	153	190
Tm (ppm)	19.4	17.0	21.9	17.8	21.2	26.5
Yb (ppm)	115	109	140	109	131	164
Lu (ppm)	16.4	16.1	20.4	15.7	18.7	23.2

## DEEP FOX BULK SAMPLE (FDC-21-01)



# LAKE NAIVASHA AREA – EAST AFRICAN RIFT



# INCOMPATIBLE ELEMENTS

PERIODIC TABLE OF THE ELEMENTS																	
H																	He
Li	Be																
Na	Mg																
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La°	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac*															
LIGHT REE									HEAVY REE								
La°	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu			
Ac*	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lw			

# MAJOR REE MINERALS AT FOXTROT

Allanite  $(\text{Ca},\text{Ce})_2(\text{Fe}_2,\text{Fe}_3^+,\text{Al}_2\text{O} - (\text{SiO}_4)(\text{Si}_2\text{O}_7)(\text{OH})$

Fergusonite  $(\text{Y},\text{Er},\text{Ce},\text{Fe})\text{NbO}_4$

Chevkinite  $(\text{Ce},\text{La},\text{Ca},\text{Th})_4(\text{Fe}_2^+,\text{Mg})(\text{Fe}^{2+},\text{Ti},\text{Fe}^{3+}) - (\text{Ti},\text{Fe}^{3+})_2(\text{Si}_2\text{O}_7)_2\text{O}_8$

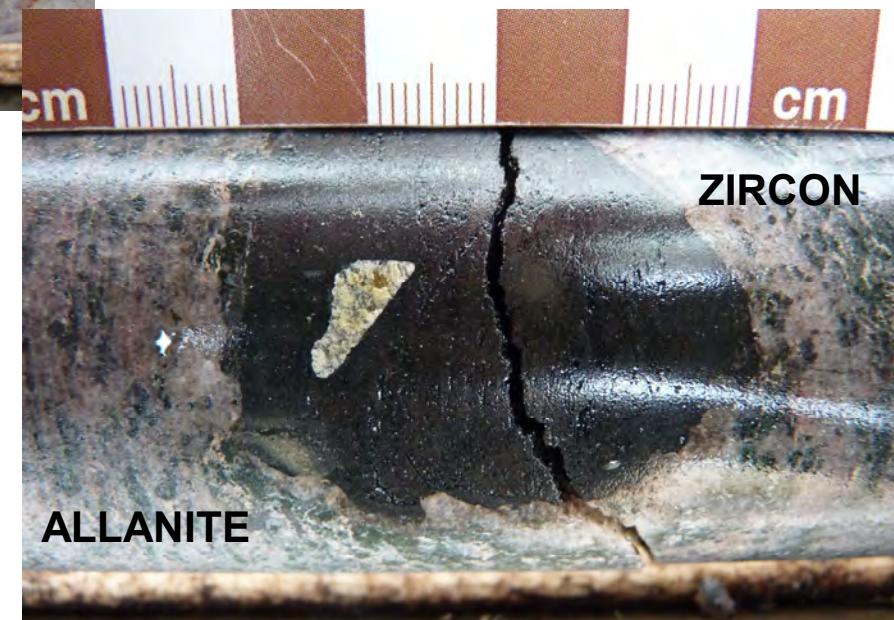
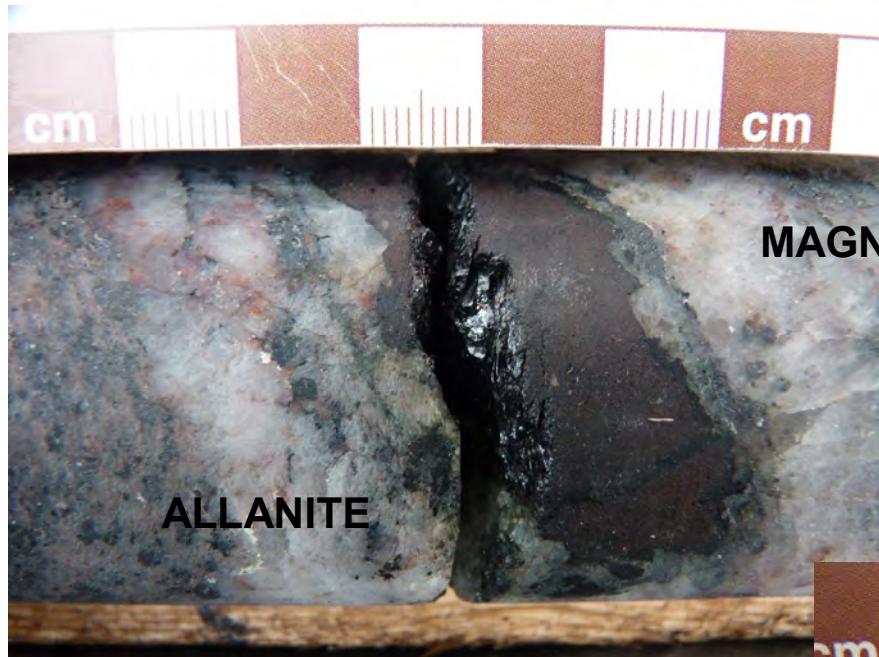
Monazite  $(\text{Ce},\text{La},\text{Pr},\text{Nd},\text{Th},\text{Y})\text{PO}_4$

Bastnasite  $(\text{Ce}, \text{La})\text{CO}_3\text{F}$

Zircon  $\text{ZrSiO}_4$

Apatite  $(\text{Ca},\text{Ce},\text{Y})_5(\text{PO}_4,\text{SiO}_4)_3(\text{F},\text{Cl},\text{OH})$

## REE MINERAL ASSEMBLAGE



# HOW TO EXPLORE FOR FOXTROT-TYPE REE MINERALIZAITON

- **REGIONAL DATA**
  - ANCIENT CONTINENTAL RIFT ENVIRONMENTS
  - PERALKALINE ROCKS – VOLCANIC AND/OR SUBVOLCANIC
  - REGIONAL MAGNETIC AND RADIOMETRIC SURVEYS
  - LITERATURE RESEARCH – NL GEOLOGICAL SURVEY
- **FIELD LEVEL PROSPECTING**
  - INCOMPATIBLE ELEMENTS – REE, ZR, Y, NB, U, TH ETC.
  - SPECTROMETER/SCINTILLOMETER
  - MAGNETIC SIGNATURES – HAND MAGNET
- **FOLLOW-UP**
  - GRAB SAMPLES – FULL MAJOR ELEMENT, MINOR ELEMENT & TRACE ELEMENT
  - CHANNEL SAMPLING TO OUTLINE EXTENT OF GRAB SAMPLE IDENTIFIED MINERALIZATION
- **QUESTIONS ?**
  - SAMPLES TO LOOK AT

**ESTIMATED DEEP FOX MINERAL RESOURCE (December 31, 2021)**

Search Minerals Inc.					
Classification	Tonnage	Pr	Nd	Dy	Tb
	000s	ppm	ppm	ppm	ppm
Open Pit					
Indicated	3,906	399	1,482	201	34
Inferred	1,028	332	1,243	181	30
Underground					
Indicated	1,148	378	1,426	203	34
Inferred	2,269	382	1,443	206	35
<b>Total Indicated</b>	<b>5,054</b>	<b>394</b>	<b>1,469</b>	<b>202</b>	<b>34</b>
<b>Total Inferred</b>	<b>3,297</b>	<b>366</b>	<b>1,381</b>	<b>198</b>	<b>33</b>

## Foxtrot Mineral Resource (December 31, 2021)

Classification	Tonnage (000 t)	Grade			
		(ppm Pr)	(ppm Nd)	(ppm Dy)	(ppm Tb)
Open Pit					
Indicated	4,577	366	1,372	175	30
Inferred	413	322	1,202	173	29
Underground					
Indicated	5,462	365	1,366	177	30
Inferred	2,593	379	1,413	177	31
Totals					
Total Indicated	10,040	366	1,368	176	30
Total Inferred	3,006	371	1,384	177	30

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Open Pit Mineral Resources were reported inside a resource shell at pit discard Net Value cut-off value of \$260/t. Underground Mineral Resources were constrained with mineralization wireframes below the resource shell and validated using underground mining solids based on a Net Value cut-off value of \$335/t. Both cut-off values account for all processing, G&A, refining, and transportation charges. Mining costs were assumed at \$6.50/t ore mined and \$5.00/t waste mined for open pit and \$75.00/t for underground.
3. Net Value values were assigned to blocks using metal prices, metallurgical recoveries, payables (as shown in their respective sections of this Technical Report) for each individual element.
4. A minimum mining width two metres was used for both open pit and underground.
5. A bulk density of 2.71 t/m<sup>3</sup> was used.
6. Revenue attributable to Pr, Nd, Dy, and Tb represent 92% of the total revenue.
7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Totals may not add or multiply accurately due to rounding.