

SUP Table 1. Summary of basic soil chemical and mineralogical properties (mean (range) unless otherwise indicated) from the 10 prospects

Prospect (No of samples)	Textural Classification	Soil pH	EC ($\mu\text{S}/\text{cm}$)	Organic carbon (%)	$\text{CO}_3\text{-C}$ (%)	Fe_{ox} (%)	Mn_{ox} (ppm)	SSA ^a (m^2/g)	Minerals present ^b
Claypan (5)	Sandy loam	5.0 (4.8-5.2)	36 (27-50)	0.32 (0.24-0.38)	0 (-)	0.21 (0.19-0.24)	169 (12-312)	16 (12-18)	qz, f, kt, ht, gt, mht, an, (ill/mvt, ct)
Ryansville (9)	Loamy sand	4.5 (4.3-5.0)	133 (55-251)	0.35 (0.22-0.48)	0 (-)	0.18 (0.12-0.25)	40 (11-134)	10 (8-13)	qz, f, kt, ht, gt, mht, an, ill/mvt, ca
Ombombo (11)	Loamy sand	6.1 (5.4-6.9)	10 (6-19)	0.22 (0.18-0.26)	0 (-)	0.12 (0.08-0.15)	32 (11-44)	4 (3-5)	qz, f, kt, ht, gt, mht, ill/mvt, ca, dol
Gala (12)	Sandy loam to clay loam	8.6 (8.0-9.4)	1101 (261-10,980)	0.87 (0.49-1.24)	0.39 (0.01-0.93)	0.19 (0.14-0.25)	435 (251-732)	56 (31-80)	qz, f, kt, ht, (mht), ab, ca, st, t
Blue Haze (9)	Sand to sandy loam	7.6 (6.5-8.9)	242 (78-631)	0.85 (0.63-1.36)	0.11 (0.01-0.21)	0.14 (0.13-0.17)	9 (2-15)	9 (4-21)	qz, f, kt, ht, an, dol
West Quest (8)	Loam to clay loam	8.2 (5.2-9.3)	1086 (54-6320)	1.11 (0.82-1.50)	0.16 (0.02-0.44)	0.20 (0.17-0.26)	210 (115-275)	62 (53-75)	qz, f, kt, ht, gt, mht, an, ab, ca, dol
Crossroads (8)	Loamy sand to silty clay loam	8.7 (6.4-9.5)	1952 (129-7990)	0.48 (0.27-0.75)	0.12 (0.06-0.20)	0.17 (0.15-0.21)	97 (14-308)	26 (13-58)	qz, f, kt, ht, gt, (mht), an, ill/mvt, ab, (ca, dol), t
Bugeye (12)	Sandy loam	5.2 (4.4-7.2)	84 (37-405)	0.73 (0.45-1.16)	0 (-)	0.18 (0.13-0.23)	38 (5-120)	20 (12-25)	qz, f, kt, ht, gt, mht, an, ill/mvt, t
Silverstone (12)	Loamy sand to clay	6.2 (4.7-7.9)	394 (16-3100)	0.34 (0.15-0.67)	0.072 (0.007-0.13)	0.10 (0.08-0.12)	103 (1-560)	15 (8-33)	qz, f, kt, ht, mht, an, ill/mvt, ab, (ca), dol
Reynolds Rg. (12)	Sandy loam to sand	6.4 (5.0-8.5)	68 (12-247)	0.16 (0.04-0.20)	0 (-)	0.12 (0.07-0.16)	100 (11-196)	10 (1-16)	qz, f, kt, ht, ill/mvt

^a SSA = specific surface area measured by BET sorptimetry^b qz = quartz, f = feldspar, ab = amphibole, kt = kaolinite, ht = haematite, gt = goethite, mht = maghemite, an = anatase, ill = illite, mvt = muscovite, ct = chlorite, st = smectite, t = talc, ca = calcite, dol = dolomite

SUP Table 2. *Summary of major element contents (mean (range) unless otherwise indicated) from the 10 prospects*

Prospect (No of samples)	% Composition									
	Al ₂ O ₃	CaO	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SO ₃	SiO ₂
Claypan (5)	14.1 (13-15)	0.059 (0.04-0.08)	12.9 (12-14)	0.58 (0.51-0.67)	0.13 (0.09-0.15)	0.060 (0.02-0.10)	0.026 (0.023-0.030)	0.079 (0.075-0.084)	0.073 (0.060-0.084)	63.1 (57-68)
Ryansville (9)	15.3 (15-16)	0.041 (0.028-0.052)	7.3 (5.0-10)	1.31 (1.1-1.5)	0.11 (0.068-0.15)	0.025 (0.014-0.053)	0.097 (0.067-0.18)	0.072 (0.052-0.089)	0.098 (0.080-0.12)	64.4 (58-71)
Ombombo (11)	5.3 (3.8-6.7)	0.044 (0.016-0.11)	1.3 (1.1-1.6)	0.73 (0.59-1.1)	0.18 (0.10-0.41)	0.010 (0.005-0.013)	0.023 (0.018-0.035)	0.020 (0.015-0.027)	0.020 (0.012-0.026)	88.0 (86-91)
Gala (12)	10.9 (7.6-13)	5.57 (2.2-9.1)	10.0 (7.5-15)	0.84 (0.83-1.0)	6.23 (4.9-9.5)	0.13 (0.096-0.18)	0.58 (0.26-1.0)	0.045 (0.034-0.062)	0.24 (0.095-1.1)	48.1 (40-53)
Blue Haze (9)	6.0 (3.7-9.1)	0.13 (0.10-0.21)	1.3 (0.87-2.3)	0.33 (0.18-0.58)	0.49 (0.24-0.88)	0.007 (0.004-0.012)	0.11 (0.08-0.15)	0.016 (0.010-0.020)	0.071 (0.053-0.11)	83.6 (77-93)
West Quest (8)	17.3 (16-19)	0.99 (0.43-2.5)	9.7 (8.6-10.4)	1.30 (0.96-1.5)	1.81 (1.3-2.1)	0.080 (0.06-0.10)	0.31 (0.15-0.39)	0.030 (0.026-0.035)	0.12 (0.05-0.15)	57.9 (55-60)
Crossroads (8)	9.5 (6.0-18)	0.40 (0.14-1.2)	4.6 (3.3-6.1)	0.66 (0.32-1.6)	1.44 (0.67-3.7)	0.041 (0.014-0.10)	0.27 (0.10-0.84)	0.018 (0.008-0.033)	0.11 (0.04-0.31)	78.0 (55-88)
Bugeye (12)	15.3 (14-17)	0.11 (0.05-0.19)	15.3 (8.8-18)	0.60 (0.51-0.75)	0.74 (0.33-1.1)	0.031 (0.014-0.052)	0.092 (0.063-0.13)	0.070 (0.063-0.078)	0.11 (0.079-0.14)	51.4 (43-69)
Silverstone (12)	12.7 (9.3-19)	0.24 (0.044-1.4)	12.4 (10-19)	0.53 (0.27-0.95)	0.33 (0.056-1.2)	0.038 (0.01-0.13)	0.098 (0.042-0.24)	0.062 (0.052-0.074)	0.066 (0.048-0.091)	62.2 (47-75)
Reynolds Rg. (12)	11.9 (8.7-14)	0.15 (0.090-0.19)	2.8 (1.0-3.7)	3.12 (2.8-3.8)	0.51 (0.16-0.71)	0.028 (0.005-0.044)	0.40 (0.34-0.55)	0.060 (0.041-0.082)	0.029 (0.006-0.039)	72.4 (62-82)

SUP Table 3. Summary of trace element concentrations (mg/kg; mean (range)) in soil from the 10 prospects

	Ag	Au	Ba	Cd	Co	Cr	Cu	Mn	Ni	Pb	Rb	Sr	Ti	V	Y	Zn	Zr
Method ^a	AR	NAA	XRF	AR	NAA	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF	XRF
Claypan	0.124 (0.081-0.242)	na ^b	124 (104-142)	0.078 (0.034-0.16)	7.6 (4.6-9.1)	431 (340-498)	23 (18-29)	468 (150-754)	24 (19-25)	14.2 (9-21)	31 (26-38)	20 (16-24)	4903 (4558-5144)	264 (227-302)	17 (14-18)	29 (24-34)	215 (195-240)
Ryansville	0.013 (0.001-0.032)	0.014 (-)	305 (282-306)	0.014 (0.007-0.021)	5.0 (3.1-8.4)	226 (175-321)	19 (12-30)	190 (106-413)	21 (17-25)	16.2 (12-21)	52 (49-59)	23 (17-29)	4589 (3868-5324)	97 (61-141)	17 (12-22)	29 (23-35)	350 (279-384)
Ombombo	0.36 (0.034-1.42)	na ^b	127 (105-170)	0.015 (0.002-0.068)	1.5 (1.2-1.9)	16 (12-22)	17 (8-41)	76 (39-104)	4 (3-7)	6.5 (3-10)	23 (17-31)	7 (2-12)	1231 (902-1625)	15 (10-19)	11 (10-13)	5 (2-7)	178 (147-224)
Gala	0.012 (0.008-0.019)	0.065 (0.015-0.164)	152 (132-174)	0.102 (0.067-0.148)	30.9 (24-37)	861 (506-2348)	46 (28-75)	984 (743-1403)	308 (242-453)	9.7 (7-14)	28 (16-32)	115 (38-167)	4052 (3639-4339)	150 (106-229)	18 (10-22)	77 (43-110)	106 (95-124)
Blue Haze	0.027 (0.001-0.106)	0.031 (0.004-0.079)	67 (53-76)	na ^b	3.2 (2.3-5.2)	54 (35-89)	8 (6-10)	55 (29-95)	20 (11-35)	6.9 (5-9)	11 (8-19)	21 (15-34)	1944 (1361-2749)	20 (12-28)	15 (12-17)	8 (4-11)	103 (85-129)
West Quest	0.013 (0.006-0.019)	0.010 (0.007-0.014)	111 (101-130)	na ^b	17.1 (14-20)	421 (389-454)	60 (50-75)	616 (438-766)	136 (84-201)	15.1 (9-18)	36 (31-41)	70 (55-102)	4311 (3772-4767)	193 (163-222)	21 (17-24)	33 (30-35)	152 (136-171)
Crossroads	0.003 (-)	0.005 (0.005-0.006)	63 (40-112)	na ^b	9.4 (5-17)	237 (162-399)	29 (12-63)	317 (110-775)	117 (47-362)	7.2 (4-12)	13 (8-27)	22 (13-41)	2267 (1524-3807)	92 (54-172)	12 (9-16)	21 (14-33)	86 (73-108)
Bugeye	0.06 (0.001-0.26)	0.017 (0.007-0.039)	168 (144-211)	0.018 (0.005-0.029)	21.5 (8-30)	4277 (1875-5730)	30 (16-40)	243 (107-403)	170 (76-211)	20.7 (14-30)	27 (22-31)	19 (12-23)	5319 (4431-5785)	283 (139-367)	11 (7-13)	41 (32-50)	230 (204-278)
Silverstone	0.008 (0.002-0.015)	0.012 (0.005-0.027)	126 (63-190)	0.033 (0.013-0.080)	5.8 (3.5-11)	537 (364-1044)	26 (31-37)	295 (81-969)	49 (28-87)	24.4 (19-30)	29 (17-56)	28 (8-57)	3393 (2660-5021)	179 (146-288)	11 (8-16)	30 (16-53)	144 (109-213)
Reynolds Range	0.085 (-)	na ^b	303 (229-333)	na ^b	4.7 (1.2-7.6)	24 (6-38)	8 (1-12)	220 (36-344)	9 (3-13)	19.7 (15-26)	155 (136-206)	40 (25-49)	2457 (481-3244)	33 (112-493)	29 (21-35)	23 (8-30)	372 (46-469)

^a AR = aqua regia digest/ICP-MS; NAA = neutron activation analysis; XRF = X-ray fluorescence spectrometry^b na = not available (all concentrations below detection)

SUP Table 4. *Anomalism in total elemental analyses for each traverse, which fulfil Criteria 1 and/or 2 (Criterion 1: highest assay vertically over, or within 1 field sampling point of, known mineralization; Criterion 2: the standardized residual value or z-score of an anomalous point is >2)*

Transect	Elements for which 'Criterion 1' anomalism occurred (in order of decreasing z-score)	Elements for which both Criteria 1 and 2 anomalism occurred (in order of decreasing z-score)
Claypan	Cu>Cd>Ni	–
Ryansville	–	–
Ombombo	Cu>Ni	Cu
Gala 18400N	Au*>Ni>Ag	–
Gala 18600N	Zn	–
Blue Haze	Au>Zn	–
West Quest	Cu>Ni*>Co*>Au*>Zn>Ag*>Cd*	–
Crossroads	Ni*>Co*	Ni*
Bugeye 6400N	Zn>Cu>Ni	–
Bugeye 6450N	Ag>Au>Cu>Zn>Ni	–
Silverstone 16400N	Cd%Zn%Ni>Co>Cu	
Silverstone 16500N	Co*>Zn*>Cu=Ni>Cd	–
Reynolds Range SE	Co>Cu>Zn	–
Reynolds Range NW	–	–

*highest concentration at terminal point of traverse, so may not represent peak value.

SUP Table 5. *Anomalism in total metal:major element (XRF assay) ratios for each traverse fulfilling both Criteria 1 and 2 (Criterion 1: highest concentration vertically over, or within 1 field sampling point of, known mineralization; Criterion 2: the standardized residual value or z-score of an anomalous point is >2)*

Transect	Raw Assay	Ratio						
		Element: Al	Element: Ca	Element: Fe	Element: K	Element: Mg	Element: Mn	Element: Si
Claypan	-	-	-	-	-	-	-	-
Ryansville	-	-	Ni	-	-	-	-	-
Ombombo	Cu	-	-	Cu	-	-	Cu	Cu
Gala 18400N	-	-	-	-	-	-	-	-
Gala 18600N	-	Ni>Co	-	-	Ni>Co>Cu	-	Ni>Co	Ni
Blue Haze	-	Co	-	-	Co	Co>Zn	Zn>Cu	-
West Quest	-	-	-	-	-	-	-	-
Crossroads	Ni	-	Ni>Cu	-	Cu>Ni	-	-	-
Bugeye 6400N	-	-	-	-	-	-	-	-
Bugeye 6450N	-	-	-	-	-	-	-	-
Silverstone 16400N	-	-	-	-	-	-	-	-
Silverstone 16500N	-	-	-	-	-	-	-	-
Reynolds Range SE	-	-	-	-	-	-	-	-
Reynolds Range NW	-	-	-	-	-	-	-	-

*highest concentration or normalized concentration at terminal point of traverse, so may not represent peak value.

SUP Table 6. Anomalism in total metal:soil property ratios for each traverse fulfilling both Criteria 1 and 2 (Criterion 1: highest concentration vertically over, or within 1 field sampling point of, known mineralization; Criterion 2: the standardized residual value or z-score of an anomalous point is >2)

Transect	Raw Assay	Ratio						
		Organic C (%)	Carbonate C (%)	Specific surface area	Oxalate Fe	Oxalate Mn	Soil pH	Soil EC
Claypan	-	-	- ²	-	-	-	-	-
Ryansville	-	-	- ²	Co	-	-	-	-
Ombombo	Cu	-	- ²	Cu	Cu	-	Cu	-
Gala 18400N	-	-	-	-	-	-	-	-
Gala 18600N	-	-	Ni>Au,Co,Zn >Cu>Cd	Ni>Co	-	Ni>Co	-	-
Blue Haze	-	-	Zn>Ni>Co>Cu	Au>Ni	-	-	-	Au
West Quest	-	-	Zn>Co,Ni>Cu	-	-	-	-	Ni>Cu>Zn>Co
Crossroads	Ni	-	-	-	Ni	-	-	-
Bugeye 6400N	-	-	- ²	-	-	-	-	-
Bugeye 6450N	-	-	- ²	-	-	-	-	-
Silverstone 16400N	-	-	-	-	-	-	-	-
Silverstone 16500N	-	-	-	-	-	-	-	-
Reynolds Range SE	-	-	- ²	-	-	-	-	-
Reynolds Range NW	-	-	- ²	-	-	-	-	-

¹ highest concentration or normalized concentration at terminal point of traverse, so may not represent peak value. ² No carbonate detected in soil.

SUP Table 7. Anomalism in BCL metal:major element (XRF assay) ratios for each traverse fulfilling both Criteria 1 and 2 (Criterion 1: highest concentration vertically over, or within 1 field sampling point of, known mineralization; Criterion 2: the standardized residual value or z-score of an anomalous point is >2)

Transect	Raw BCL	BCL:Al	BCL:Ca	BCL:Fe	BCL:K	BCL:Mg	BCL:Mn	BCL:Si
Claypan	-	-	-	-	-	-	-	-
Ryansville	Au	Au	-	-	Au	-	-	Au
Ombombo	Co	Cd>Ni>Co	Cu	Cd>Co>Ni	Co>Ni>Cd	Cu	Ni>Co	Co
Gala 18400N	-	-	-	-	-	-	-	-
Gala 18600N	Co	Cu	-	-	Cu>Pd	Co	Co	Co
Blue Haze	Cd=Zn	Cu>Co>Ag>Ni	Au	Cu>Zn	Cu>Co>Ni>Ag	Cu>Ni>Co>Ag	-	Zn
West Quest	Au*	Mo	-	Au*	Mo	-	Co	-
Crossroads	-	-	Au	Au	-	Au	Au	-
Bugeye 6400N	-	-	-	-	-	-	-	-
Bugeye 6450N	-	-	-	-	-	-	-	-
Silverstone 16400N	Mo	-	-	Mo	-	-	-	Mo
Silverstone 16500N	-	-	-	-	-	-	-	-
Reynolds Range SE	-	-	-	-	-	-	-	-
Reynolds Range NW	-	-	-	-	-	-	-	-

*highest concentration at terminal point of traverse, so may not represent peak value.