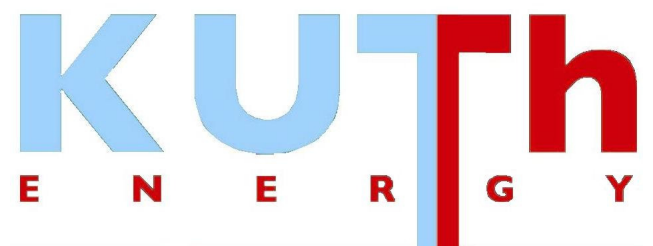


Appendix 1

Logging codes for drill logs

SEL 26/2005

Partial Surrender 2011



KUTh Exploration Pty Ltd

LOGGING CODES

COLLAR

Hole Identification System (eg. K26RC001)

- Three letter prefix with K for KUTh, and two digit number for the SEL number
- Two letter drilling type code (eg. DD or RC)
- 3 digit hole number (eg 001)

Project Codes for hole number

Code	Tenement
26	SEL 26/2005
45	SEL 45/2007
68	SEL 68/2007

Drilling type code for Hole ID

Code	Definition
RC	Reverse Circulation
HQ	HQ Diamond Core
NQ	NQ Diamond Core
BQ	BQ Diamond Core
PQ	PQ Diamond Core

DHGeology

ROCK1/ROCK2

(Use one ? as suffix if uncertain)

Age (rock type prefix – no space)

Code	Definition
Q	Quaternary
T	Tertiary
K	Cretaceous
J	Jurassic
R	Triassic
M	Permian
C	Carboniferous
D	Devonian
S	Silurian
O	Ordovician
E	Cambrian
P	Proterozoic
A	Archaean

WEATHERING PRODUCTS AND

TRANSPORTED ROCK TYPES (prefix L)

Code	Definition
LSO	Soil
LCY	Clay
LST	Silt
LSD	Sand
LGR	Gravel
LGP	Lateritic gravel

LCC	Calcrete
LSIC	Silcrete
LFE	Ferricrete
LGYP	Gypsum
LCF	Iron segregates
LGO	Gossan

BASEMENT ROCK TYPES

SEDIMENTS (prefix S)

Code	Definition
S	Undifferentiated sediments
SQ	Quartzose sediments
SQT	Quartzite
SL	Lithic sediments
SF	Feldspathic sediments
SFE	Ferruginous sediments
SG	Greywacke
SC	Conglomerates
SP	Polymict conglomerates
SM	Monomict conglomerates
SFG	Fanglomerate
SS	Arenites
ST	Siltstones
SU	Mudstones
SB	Carbonaceous/graphitic sediments

CARBONATES (prefix R)

R	Undifferentiated carbonates
RD	Dolomite
RS	Siderite
RM	Mudstone <10% grains, matrix supported
RW	Wackestone >10% grains, matrix supported
RF	Floatstone >10% large grains
RP	Packstone >10% grains, grain supported
RR	Rudstone, >10% large grains
RG	Grainstone, no mud, grain supported
RB	Boundstone, grains bound post-deposition
RI	Bindstone
RA	Framestone
RC	Crystalline carbonate

CHERTS (prefix C)

C	Undifferentiated chert
CM	Massive chert
CI	Banded Iron Formation
CJ	Jasperlitic Chert
CL	White, grey/black banded chert

GRANITOIDS (prefix G)

G	Undifferentiated intrusive
GQ	Quartz-rich granitoids
GK	Syenogranite/quartz syenite
GS	Syenite
GG	Granite
GM	Monazite/quartz monazite
GI	Monazite/quartz monzodiorite
GT	Granodiorite
GO	Tonalite
GD	Diorite/quartz diorite

MINOR INTRUSIVES (prefix P)	
P	Undifferentiated intrusive
PF	Feldspar dominated, felsic porphyry
PQ	Quartz dominant, felsic porphyry
PB	Biotite/phlogopite dom lamprophyre
PM	Amphibole dom. Lamprophyre
PI	Andesitic porphyry
PD	Dacitic porphyry
PA	Aplite
PP	Pegmatite
FELSIC VOLCANICS (prefix F)	
F	Undifferentiated felsic volcanic
FT	Trachytes
FR	Rhyolite
FD	Rhyodacite
FS	Felsic volcanoclastic sediment
FC	Felsic agglomerate
FV	Tuff
INTERMEDIATE VOLCANICS (prefix I)	
I	Undifferentiated intermediate volcanic
IA	Andesites
IT	Latite/trachy-andesite
IB	Basaltic andesite
ID	Dacite
IV	Intermed. Volcanic, tuff
MAFIC VOLCANICS (Prefix B)	
B	Undifferentiated mafic volcanic
BI	Andesitic-basalt
BM	High mg-basalt
BT	Tholeiitic basalt
BL	Plagioclase dominant basalt
BA	Amphibole dominant basalt
BC	Chlorite dominant basalt
BP	Porphyritic basalt
BV	Basaltic volcanoclastics, tuff
MAFIC INTRUSIVES (prefix D)	
D	Undifferentiated mafic intrusive
DD	Dolerite
DQ	Quartz dolerite
DG	Gabbro
DT	Quartz gabbro
DN	Gabbro-norite
DA	Anorthosite
ULTRAMAFIC VOLCANICS (prefix K)	
K	Undifferentiated ultramafic volcanic
KA	Aphanitic komatiite
KS	Spinifex textured komatiite
KC	Cumulate textured komatiite
KCA	Adcumulate
KCO	Orthocumulate
KCM	Mesocumulate
ULTRAMAFIC GENERAL (prefix U)	
U	Undifferentiated ultramafic intrusive
UP	Peridotite (40-90% olivine)
UD	Dunite (>90% olivine)
UR	Pyroxenite (>50% pyroxene)
UA	Hornblendite (>50% hornblende)

US	Serpentinised ultramafic
UT	Talc dominated serpentinite
UC	Chlorite dominated serpentinite
UM	Tremolite dominated serpentinite
SCHISTS (prefix Z)	
Z	Undifferentiated schist
ZB	Biotite dominated schist
ZC	Chlorite dominated schist
ZM	Muscovite dominated schist
ZS	Sericite dominated schist
ZT	Talc dominated schist
ZP	Feldspar dominated schist
ZQ	Quartz dominated schist
ZA	Amphibole dominated schist
ZU	Fuchsite bearing schist
ZQF	Quartz-feldspathic schist
GNEISS (prefix N)	
N	Undifferentiated gneiss
NF	Quartzo-feldspathic gneiss
NA	Amphibolitic gneiss
NC	Calc-silicate gneiss
NM	Magmatic gneiss
AMPHIBOLITES (prefix M)	
M	Undifferentiated amphibolite
MM	Actinolite dominated amphibolite
MU	Tremolite dominated amphibolites
MB	Hornblende dominated amphibolites
MX	Pyroxene dominated amphibolite
MXC	Clinopyroxene-plagioclase rocks
MXO	Orthopyroxene –plagioclase rocks
MYLONITES (prefix Y)	
Y	Undifferentiated mylonite
YM	Mafic to ultramafic derived mylonite
YI	Intermediate to mafic derived mylonite
YF	Felsic to intermediate derived mylonite
YG	Granitoid-derived mylonite
YS	Sericite dominated mylonite
SULPHIDE BEARING ROCKS (prefix x)	
X	Undifferentiated sulphide bearing rock
XPY	>50% pyrite rock
XA	>50% arsenopyrite rock
OTHER	
V	Vein
NS	No sample
STOPE	Void/stope
BX	Breccia (unknown host rock)
BXA	Breccia with angular clasts
BXR	Breccia with rounded clasts
AZ	Altered zone with loss of textured and no parent rock type determined
FZ	Fault Zone

Formation

Qu	Quaternary Sediments
Tb	Tertiary Basalt
Ts	Quartzose sand and gravel
Ps	Parmeener Supergroup Undifferentiated
Ru	Upper Parmeener Supergroup
Pu	Lower Parmeener Supergroup
SDs	Mathinna Beds
Jdl	Jurassic Dolerite

Rock1_Qual/Rock2_Qual

Rock1 and Rock2 descriptor field

****Note: if using more than one qualifier, separate by a /. Eg. Y/A

Transported/Weathered Rock type Qualifiers

Code	Definition
Y	Clayey
S	Sandy
G	Gravelly
A	Alluvium
C	Colluvium
W	Aeolian
U	Running sand (at base of channels)
Q	Dominantly quartzose fragments
P	Dominantly pisolithic fragments
R	Dominantly basement rock fragments
E	Dominantly pedolith/saprolite fragments
F	Ferruginous lithic fragments
PU	Puggy
HE	Hematite stained
GO	Goethite stained

Residual Rock Qualifiers

BD	Bedded	ML	Melanocratic
GR	Graded	HF	Hornfels
BX	Brecciated	CR	Crenulated
FT	Foliated	SA	Saccharoidal
FO	Folded	GP	Graphitic
FR	Fractured	WQ	Equigranular
JN	Jointed	FL	Flow banded
PO	Porphyritic	SC	Schistose
LA	Laminated	HY	Hyaloclastitic
MA	Massive	SE	Seriate
IN	Intruded	SP	Spherulitic
BW	Boxworked	FU	Facing upwards
VCG	>30mm grains	FD	Facing downwards
CG	5-30mm grains	GP	Granoblastic
MG	1-5mm m	LI	Lineated
FG	<1mm grains	BI	Bimodal
VFG	<0.1mm grains	PH	Phyllitic
V	Vesicular	CU	Cumulate
IG	Intergranular	OP	Ophitic
XB	Cross-bedded	XN	Xenolithic
FM	Flame structure	LC	Load clast
CB	Carbonaceous		
PB	Pebbly	RP	Ripple marks
LE	Leucocratic	ME	Mesocratic

COLOUR (Sample Colour)

**** Note: use multiple codes only when there is more than one colour in the rock and separate using a “/”, e.g. R/B

Code	Definition
R	Red
I	Pink
O	Orange
Y	Yellow
G	Green
L	Blue
P	Purple
D	Black
A	Grey
W	White
K	Khaki
B	Brown
C	Cream
QUALIFIERS	(place after colour code, e.g. B1)
1	Light
2	Dark

REGOLITH (Description of weathering profile)

Code	Definition
TPD	Transported or superficial deposits
LAKE	Lake clays and associated deposits
L	Lateritic residuum: Duricrust and lateritic gravels; complete replacement of primary and secondary fabric
SOIL	Residual soil: Derived from basement material
USAP	Upper saprolite: Lack of primary rock fabric; leached or secondary cemented
REDOX	Redox front: strong fe-rich zone between upper and lower saprolite; typically strongly goethitic if acidic or rarely hematitic if alkaline; typically <5m thick
LSAP	Lower saprolite: clay mineral dominated; <70% secondary oxides; primary fabric preserved; chlorite typically present; sulphides absent or replaced; may preserve rock colour.
SAP	Saprolite; use if upper or lower saprolite not determined.
SAPRK	Saprock: <20% secondary oxides; fine detail in fabric preserved; sulphides weathered; preserved felsic minerals
FRESH	Fresh rock: fresh sulphides and silicates

REG_QUAL (Description of regolith zone)

****Note: separate multiple codes by a “/”

Code	Definition
F	Ferruginised
C	Calcified
S	Silicified
H	Hardpanised

W	Weakly mottled, <10% mottled
M	Moderately mottled, 10-30% mottles
S	Strongly mottled, >30% mottles
IH	Indurated hematite body
IG	Indurated goethite body
GX	Pervasive ferruginous boxwork
GL	Laminated ferruginous boxwork

SHEAR (Estimate of % shearing)

Code	Definition
0	Unfoliated and undeformed rock
10	Very weak foliation
20	Weak foliation: continuous or slaty cleavages and other primary flattening and deformation involving mineral alignment
30	Moderately strong foliation: poorly developed metamorphic segregation
40	Strong foliation: development of segregation banding; micaceous minerals dominant; pervasive foliation; original rock type discernable
50	Schistosity: moderate to strong segregation banding; some primary textures preserved
60	Schistosity: strong mineral segregation into compositional laminae
70	Strong foliation with slickensiding & mineral growth on s-surfaces; broken rock
80	Protomylonite/cataclastite
90	Mylonite/cataclastite
100	Ultramylonite/cataclastite

SULPHORE_% (Estimate of percentage of digenetic and hydrothermal sulphide or ore minerals)

SULPHORE_TYPE (record sulphide or ore minerals present.

*** Note: separate multiple minerals by a “/”

Code	Definition	Code	Definition
AR	Argenite	MO	Molybdenite
AS	arsenopyrite	PT	Pentlandite
BI	Bismuth	PY	Pyrite
BO	Bornite	PL	Pyrolusite
CO	Chalcocite	PO	Pyrrhotite
CP	Chalcopyrite	SP	Sphalerite
CB	Cinnabar	SB	Stibnite
CV	Covellite	SU	Sulphide-unknown
EN	Enargite	AZ	Azurite
GL	Galena	MA	Malachite
\$G	Gold		

VN_TYPE (recorded vein types present)

Code	Definition	Code	Definition
Q	Quartz	P	Epidote
C	Calcite	A	Amphibole
B	Carbonate	Y	Pyroxene
G	Gypsum	T	Tourmaline
H	Hematite	F	Fuchsite

I	Biotite	W	Scheelite
L	Chlorite	O	Iron oxide
U	Fluorite	M	Molybdenum
X	Sulphide	Y	Pyrite
CT	Cassiterite	TC	Talc
Z	Zeolite	PR	Prehnite

VN_% (0-100% estimate of all vein types present)

VN_QUAL (description of veins)

Code	Definition	Code	Definition
A	Anastomosing	M	Multistage
B	Brecciated	S	Sheeted
C	Comb texture	T	Stockwork
D	Diffuse	V	Vuggy
E	Massive	W	wispy
L	laminated	X	Boxwork

INT_ALT (Any % between 0 and 100%)

Guide%	Definition
0	No alteration
10	Very weak alteration
20	Weak alteration
50	Moderate alteration
80	Strong alteration: replacement of mineralogy, fabric preserved
100	Intense alteration: total replacement of original fabric and mineralogy

ALT_TYPE (separate multiple codes by a “/”, list in order of abundance. Use SULPORE_TYP to list sulphide minerals present).

Code	Definition	Code	Definition
BI	Biotite	GT	Garnet
CB	Carbonate	GR	Grunerite
CH	Chlorite	HB	Hornblende
CY	Clay	AC	Actinolite
F	Fuchsite	KF	K-feldspar
FE	Iron oxide	TR	Tourmaline
FL	Fluorite	DI	Diopside
H	Hematite	SM	Sulphide-mix
KA	Kaolin	SS	Single sulphide
MT	Magnetite	AB	Albite
MU	Muscovite	PX	Pyroxene
SI	Silica	GO	Goethite
SR	Sericite	CC	Calcite
TC	Talc	EP	Epidote
AK	Ankerite	RT	Rutile/lucoxene
SD	Siderite	QZ	Quartz
GF	Graphite	SP	Serpentinite
BR	Bronzite		

ALT_QUAL (textural description, nature of alteration, separate multiple codes by '/')

Code	Definition
U	Unidentified plumbing; pervasive overprint without shearing
UM	Unidentified plumbing; replacement of matrix/groundmass
UC	Unidentified plumbing; replacement of clast/phenocryst
UB	Unidentified plumbing; replacement of bedding
UP	Unidentified plumbing; patchy or irregular plumbing
X	Hydrothermal breccia
S	Pervasive overprint with shearing
SSB	Selective replacement of bedding within shear zone (assume shear as plumbing)
SSD	Selective replacement of mineral component within shear zone (assume shear as plumbing)
SP	Patchy or irregular alteration within shear zone (assume shear as plumbing)
V	Selvage to vein
VSB	Selective replacement of mineral component where vein acts as plumbing
VSD	Pervasive selective replacement of mineral component where vein acts as plumbing
VP	Patchy or irregular alteration where vein acts as plumbing
W	Selvage to stockwork
WSB	Selective replacement of bedding where stockwork acts as plumbing
WSD	Selective replacement of mineral component where stockwork acts as plumbing
F	Fracture fill
FS	Fracture fill with selvage

Effectiveness

1	Nonefficient geochemical test, or hole did not reach target.
2	Effective geochemical test – hole reached at least lower saprolite zone.
3	Hole reached planned geological target.