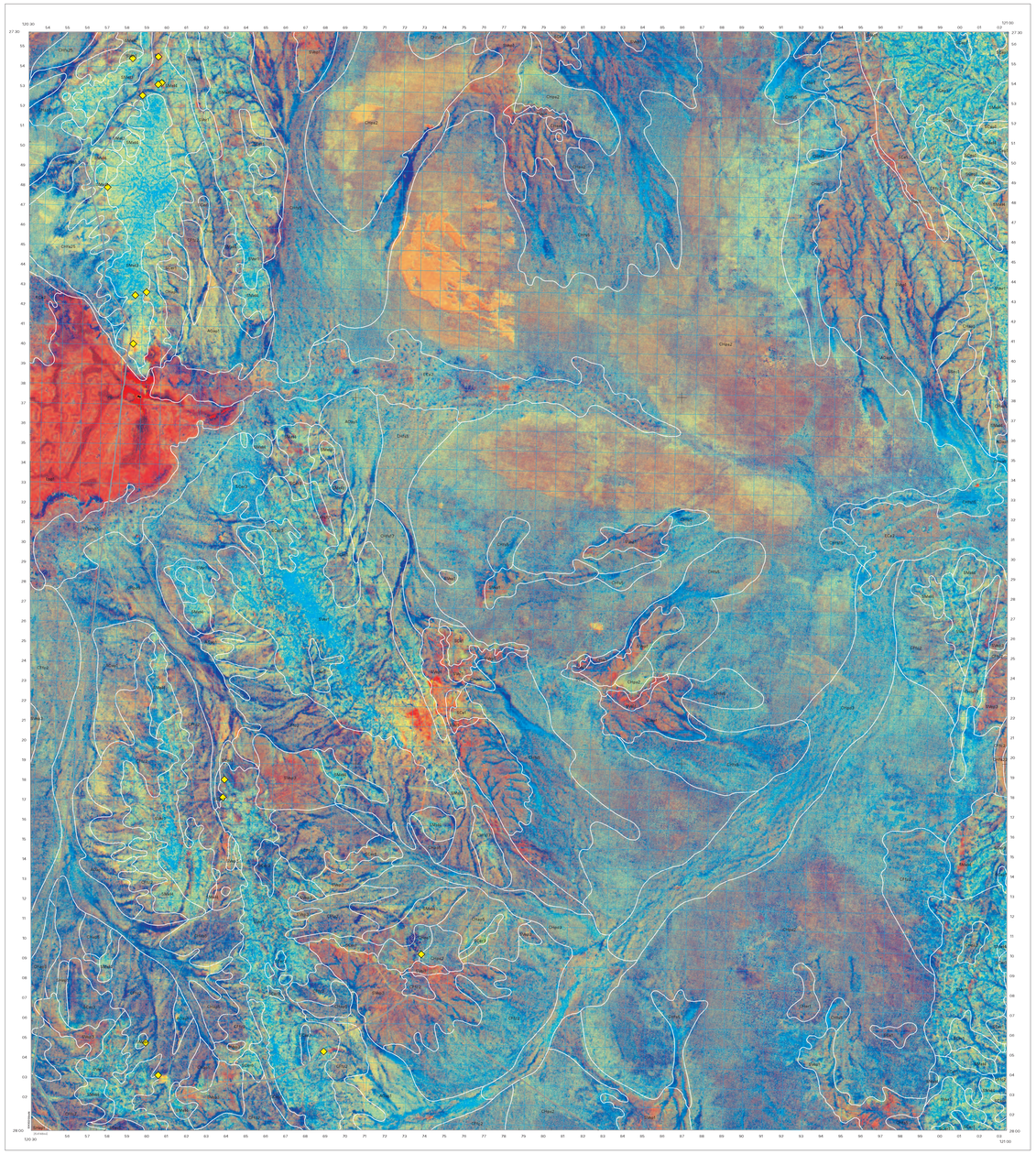
SIR SAMUEL

AUSTRALIA 1:100 000

ENHANCED THEMATIC MAPPER IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS

SHEET 3042



Transported regolith

Alluvial sediments

Overbank deposits

AOa2 — *Fluvial sediments with mainly overbank characteristics. Channel deposits rarer. Extensive clays with interbedded discontinuous granule, gravel and sandy lenses. Occur on a flat floodplain with some narrow levee banks flanking some channels.*

AOag1 — *Alluvial clay loams and light clays with some bands and lenses of coarse stream-bed deposits. A few lenses of calcrete with extensive hardpan development at 0.75m. Sediments are primarily derived from greenstone sources and are interrelated with the distal portions of sheet flow fan sequences.*

Colluvial sediments

Sheet flow deposit

CHag1 — *Clay loam to light clays overlying greenstone saprock and saprolite. Channel deposits present in broad flat drainage floors within alluvial plain in broad major tributary valleys. Granule to gravel sized lag consisting of ferruginous saprolite and pisolithic.*

CHag5 — *Granular fine sandy clay to light clays initially as sheet flow deposits now almost completely reworked into low gilgai mounds. Overlying weathering greenstone saprock and saprolite. Flat floored hollows between banks with quartz, lithic ' gravels and pebbles. Granular ferruginous and lithic lags on banks.'*

CHer1 — *Colluvial sediments consisting of gritty sandy loam derived from a substrate varying from weathered to fresh granitic bedrock. Small patches of fresh granitic bedrock are exposed but only represent about 5pc of the surface exposure. Regolith thickness varies from 4m to less than 1m.*

CHer4 — *Pockets of gritty sandy colluvium derived from weathering granite.*

CHer5 — *Sediments consisting of 1-2m thick sandy to clayey loams with extensive surface gravel and granular quartzo-feldspathic and ferruginous lag underlain by metasediments (shales) and granite. 5m thick hardpan within >0.5m depth; pockets of calcrete, and gravel lenses.*

CHfs5 — *Fine grained sediments; some lenses of coarse grained channel deposits. Extensive 2-5m thick hardpan; substrate consists of an extensive and deeply weathered stripped granitic pesilte. Minor contributions from mafic rock sources shown in lags. Hardpan from 0.5 to 1m; acid red earths common. Flat to gently inclined plains sometimes fan shaped.*

CHfs15 — *Clay loams and light clays with lenses of channel gravels and lenses of calcrete at depth form a gently inclined fan shaped plain. Greenstone saprolite is predicted to be generally 15m below the surface. Some patches of hardpan present; granule to gravel lags dominated by ferruginous components.*

CHs17 — *Extensive cobble and gravel-sized lag deposits derived from greenstone outcrops and banded iron formation. Mid to lower slopes of strike ridges and inter-ridge hilly tracts are mantled by saprolite fragments.*

CHs22 — *Fine sandy loams to fine sandy clay loams as sheet flow deposits on a very gently inclined plain traversed by a network of broad, flat floored, shallow drainage channels. Extensive surface lag of granule to gravel sized quartz throughout and hardpan within 1m. Local patches of salinisation. Ferruginous dark brown to black strongly Mottled and pallid saprolite.*

CHs25 — *Fluvially transported sediments as sheet flow fans with fine black granules as a major component on a gently inclined plain. Acid red sands with hardpan in the upper 1.5m.*

CHpd3 — *Colluvial clayey sands; some hardpan within the upper 2m of the regolith, and rarer pockets of calcrete.*

CHpd9 — *Extensive colluvial sediment derived mostly from greenstones and rarely less than 2m thick usually >.5m and consists of clayey fine sands to clay loams, with some localised clay-rich pans. Mottled plastic clays at >.5m. Sediments occur along broad drainage axes. Broad sinuous rises with irregular shaped crests and floors and are in part anastomotic.*

CHpa1 — *Deep colluvial clayey sands and aeolian sands; some saprock exposed; some lateritic gravels and duricrust exposed, " and as subcrop on bread cresta."*

CHpa2 — *Extensive lateritic profiles eroded on crests. Deep colluvial sands and gravels on slopes and swales. Saprolite is extensive.*

CHpa5 — *Sandy deposits partly reworked by wind. Evaporite deposits associated with major saline playa systems. Occasional patches of calcrete. Acid red sands and acid red sandy earths. Local duplex profiles with compact structureless brown clay B Horizons.*

Colluvial fan deposits

CFfc2 — *Colluvial mantle containing pisoliths, quartz, ferruginous saprolite and lithic fragments overlying pisolitic lateritic residuum, iron segregations merging into greenstone saprolite and saprock. Polymictic lags vary from fine ferruginous to coarse lithic fragments and locally derived quartz.*

Evaporite

Calcrete

ECa2 — *Calcrete up to 10m thick, overlain by and interleaved with fluvial deposits but also rests directly on granite saprolite, saprock and unweathered granite. Usually occupies broad drainage axes within major valley floors, slight irregular depressions, undulations and minor sinkholes are common.*

Lacustrine sediments

Lacustrine sediments

Lpp1 — *Extensive playa floors consisting of sediments dominated by clays, gypsum and halite;*

In-situ regolith

Saprolite

Completely weathered bedrock

SCa1 — *Large patches of shallow gritty sand; locally derived colluvium; extensive quartzo-feldspathic grits; boulder and cobble silcrete lag common; extensive pallid saprolite exposures.*

SCag1 — *Upper parts of the ferruginous horizon are discontinuous. Duricrusts and iron segregations are common. Pisolitic lateritic residuum is rare. A colluvial mantle of ferruginous gravels, pebbles and fragments is extensive and covers gently inclined plain. Acid granular to gravelly fine sandy red earth with hardpan within 1m of the surface.*

SCar1 — *Fine granular ferruginous veneer on weathered greenstones. Represents erosional relicts of an earlier extensive weathered landsurface. Crestal regions are slightly eroded exposing deeper parts of the weathered mantle. Lateritic materials (pisolitic and indurated), iron segregations, hardpan, fe-saprolite.*

SCer3 — *Relicts of an earlier weathered landscape on greenstones, now stripped at the crests of rises and forming colluvial lower slopes. Ferruginous nodules, saprolite, gossanous material, rare lateritic duricrust, medium granular sandy loam, colluvial sands, flare calcrete, hardpan at 50cm, red earths.*

SCer5 — *Thin complex association of ferruginous saprolite and ferruginous mottled zone overlying lateritic residuum on weathered greenstone bedrock. Pisolithic granules, ferruginous saprolite and indurated mottled zone fragments as ' lag with a fine granular red sand to loamy fine sandy matrix.'*

SCer6 — *Extensive exposures of iron segregations in completely weathered greenstone bedrock. Extensive gravel to pebble surface lags. Some patches of colluvium over discontinuous but extensive saprolite exposures. Some scattered exposures fresher rock. Patches of calcrete and calcareous earths. Shallow stony acid red earths and some hardpan*

Very highly weathered bedrock

SVa1 — *Highly kaolinised granitic bedrock; rare fresh outcrop; local pockets of colluvial gritty sand; lag consists of quartzo-feldspathic grits and gravel, and some silcrete cobble.*

SVag1 — *Rare outcrops of fresh granitic bedrock; common pallid granite saprolite exposures and subcrop; thin discontinuous colluvial gritty sands with quartzo-feldspathic granule lag with rare silcrete fragments and very rarely developed calcrete.*

SVag3 — *Thin discontinuous gritty sandy colluvium over pallid felsic saprolite and rare outcrops of fresher rock. Very rare calcrete and silcrete, some hardpan.. Extensive quartzo-feldspathic granular lag, with rare silcrete pebbles and some ferruginous granules. Tends to occur below breakaways as undulating and inclined tracts and concave pediments*

SVer1 — *Extensive exposures of greenstone sequences with local patches of ferruginous saprolite usually as flat ridge crests. Calcrete, extensive stony colluvium. Excalised exposures of iron segregations imassive ironstones. Lags consisting of ferruginous and lithic fragments.*

Highly weathered bedrock

SHag1 — *Extensive saprolite formed from metamorphosed felsic volcanics sometimes covered by a thin colluvial mantle. Extensive quartzo-feldspathic granule and gravel lag with some ferruginous fragments. Large patches of silcrete pebbles. Shallow acid red and red-brown gritty sandy earths are dominant. Sediments occur above breakaways*

Moderately weathered bedrock

SMe3 — *Moderately weathered greenstone bedrock with patches of calcrete. Some colluvium and scree deposits on hills to low hills and moderately eroding slopes. A general mantle of cobble-sized lag is present. Little or no deeply weathered remnants remain in these hilly belts.*

SMe4 — *Patches of lateritic residuum. Some duricrust, iron segregations, mottled zone and calcrete. Clayey sands and clay loams, ferruginous granules, and gravels often formed as colluvium. Extensive saprock and saprolite at depth. Rare outcrops of fresh rock. Lags variable and extensive.*

Slightly weathered bedrock

SSe1 — *Saprock extensively developed over greenstone subcrop. Patchy calcrete exposures. Extensive granule sized lag; some narrow alluvial tracts with minor drainage channels in broad drainage floors within a complex array of very low rises and shallow swales. Generally part of a gently undulating plain.*

MINERAL OCCURRENCE

Gold

(Data provided by Bureau of Resource Science from the MINLOC database)

THEMATIC MAPPER SIGNATURE

Red	Clay dominated surface response
Green	Iron oxide dominated surface response
Blue	Vegetation dominated surface response
Yellow	Surfaces with iron oxides and clays dominated
Cyan	Vegetated regions on iron oxide dominated surfaces
Magenta	Vegetated regions on dominantly clay covered surfaces

DEPOSITIONAL LANDFORMS

a	Alluvial landforms
ap	Alluvial plain
af	Flood plain
fc	Colluvial fan
fs	Sheet flow fan
pd	Depositional plain
pp	Playa plain
ps	Sandplain

EROSIONAL LANDFORMS

e	Erosional landforms
ep	Erosional plain
ei	Pediment
ec	Etchplain
er	Rises
el	Low hills

INDURATION MODIFIER

Duricrust - nodular; iron rich; fragmental as single species or a mixture

Calcrete - pods, slabs, blocky; and massive

Calcareous earths; calcareous nodules; soil carbonate.

Lag - variable composition but dominantly gravel-sized consisting of bedrock fragments

Lag gravels: dominantly sandy quartzofeldspathic, or quartzofeldspathic granules or mixtures

Lag gravels: fine ferruginous gravels (mostly without cutans on grains).

Ferruginous fragments - mixed composition: lateritic residuum, duricrust, Fe segregations, Fe-saprolite and Fe stained hardpan.

Iron segregations in exposed saprolite, or concentrated at the surface.

Hardpan - either dominantly silliceous cement and iron stained; or dominantly iron cemented

Highway

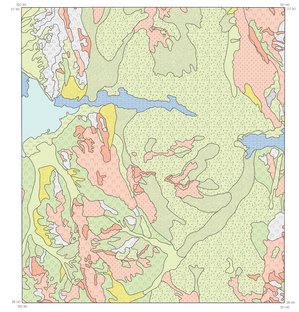
Minor road

Vehicle track

Minor administrative boundary

Landing ground

SIR SAMUEL REGOLITH-LANDFORMS



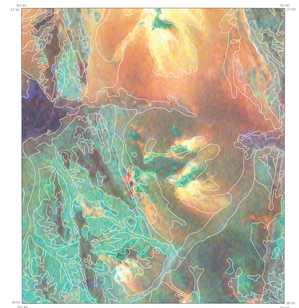
Relict

Erosional

Depositional

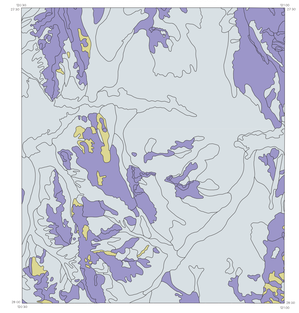
NOTE: The CSIRO "RED " classification is provided for comparative purposes for those more familiar with that scheme

COMPOSITE RADIOMETRIC IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS



Red	Potassium (Regions associated with exposed granitic bedrock)
Green	Thorium (Various ferruginous materials at the surface)
Blue	Uranium (Calcretes; calcareous sediments and soils)
Black to brown	Low K, Th, U (Duricrusts and exposed bedrock low in K, Th & U; often greenstones and some sandplains)
White to yellowish	High K, Th, U (Geomorphically active regions associated with exposed granitic saprolite and sediments derived from granite)

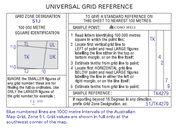
INTERPRETED LANDSCAPE CLASSES



DATA SETS USED TO CONSTRUCT MAP

A RC9 1:8,2,000 aerial photography
B Landsat TM imagery
C Radiometric imagery - acquired by AGSO, and processed by A. Whitaker (AGSO).

UNIVERSAL GRID REFERENCE


GRID ZONE DESIGNATION
51J
100 000 METRE SQUARE IDENTIFICATION
TK
UK
TJ
UJ
IGNORE the SMALLER figures of any grid number; these are for use with GPS receivers ONLY. Use LARGER figures of the grid number for example:
51JTK4079
TO SAVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 100 METRES
SIMPLE POINT: ACCURACY 100 M
1 Read letters identifying 100 000 metres square in which point lies
2 Locate first vertical grid line to LEFT of point and read LARGE figures labelling line
3 Estimate tenths from grid line to point
4 Locate first horizontal grid line BELOW point and read LARGE figures labelling line first either the left or bottom right of the square
5 Estimate tenths from grid line to point
SIMPLE REFERENCE: TK4079
If reporting figures of 10 degree or any others in profile GHA Zone Designation, as:
51JTK4079

Blue numbered lines are 1000 metre intervals of the Australian Map Grid, Zone 51. Grid values are shown in full only at the southwest corner of the map.

SCALE 1:500 000

1000 0 1 2 3 4 5 6 7 8 9 10
Metres — Kilometres

UNIVERSAL TRANSVERSE MERCATOR PROJECTION

Latitude of Origin = 0 , Longitude of Origin = 123
Scale Factor on Central Meridian = 0.9996

This map shows the type and distribution of regolith landform units. These units are distinct patterns of regolith materials and landforms that characterise regolith associations. The map presents a systematic analysis and interpretation of 1:8,2 000 scale aerial photography, Landsat Thematic Mapper (TM) satellite imagery, field mapping and literature research.

FIELD SITE LOCATIONS

Full site descriptions are stored in AGSO's RTMAP database

Regolith 1992 by H, M, Churchward, M, A, Craig, AGSO
Compiled 1995 by H, M, Churchward, M, A, Craig, and K, Ambrose, AGSO
Map constructed by P, Unsem, AGSO
Produced by AGSO Cartographic Services Unit using ArcInfo software

Published by the Australian Geological Survey Organisation, Department of Primary Industries and Energy, Canberra, Australia.
Issued under the authority of the Minister for Primary Industries and Energy.

Topographic base information © AUSLIG 1993

It is recommended that this map be referred to as:
Craig, M, A, 1995 - Sir Samuel Regolith-landforms Enhanced Thematic Mapper image map (1:100 000 scale map), Australian Geological Survey Organisation, Canberra.

INDEX TO 1:100,000 MAPS

1:250,000 maps shown in blue

YULGUNE (SG51-5)	BOLDU (SG51-6)	BIDGEMIA (SG51-7)	BETA (SG51-8)	LAMARY (SG51-9)	DELLA POOL (SG51-10)
SIR SAMUEL (SG51-13)			DUKETON (SG51-14)		
DIRKU (SG51-17)	SIR SAMUEL (SG51-18)	DARLOT (SG51-19)	MAHLMAHWA (SG51-20)	DUKETON (SG51-21)	LOVERS (SG51-22)
MUNJINDU (SG51-25)	WILGARA (SG51-26)	MOBO (SG51-27)	NARRA (SG51-28)	MOUNT WOODROFFE (SG51-29)	MOUNTAIN LAKE (SG51-30)
	LEONORA (SG51-17)		LAVERTON (SG51-21)		
MOUNT MARGARET (SG51-33)	WILMA (SG51-34)	LETHLYNA (SG51-35)	WINDING (SG51-36)	LAVERTON (SG51-37)	BURTVILLE (SG51-38)

MAP LOCALITY

NGMA

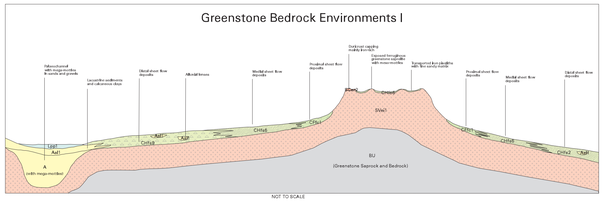
PRODUCT OF THE NATIONAL GEOSCIENCE MAPPING ACCORD
A COLLABORATIVE PROJECT
BETWEEN AGSO AND GSWA

DIGITAL DATA

All map elements are stored digitally as topologically structured ArcInfo coverages.
Descriptions for each of the map polygons and site data are stored in an Oracle relational database.
Map information can be purchased from AGSO as hard copy plots and as digital data sets.

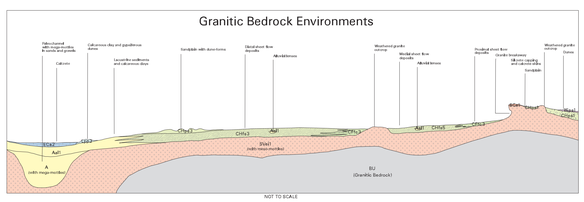
Regional Regolith Associations

Greenstone Bedrock Environments I



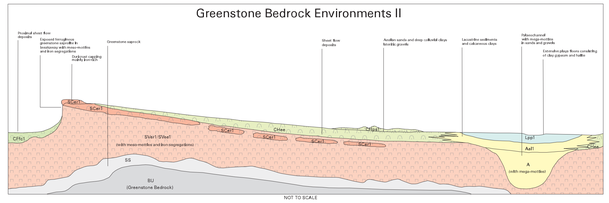
NOT TO SCALE

Granitic Bedrock Environments



NOT TO SCALE

Greenstone Bedrock Environments II



NOT TO SCALE

SIR SAMUEL

ENHANCED THEMATIC MAPPER IMAGE MAP

with

REGOLITH-LANDFORMS POLYGONS

SHEET 3042

EDITION 1

January 1998

WARNING: Colours will fade with prolonged exposure to light