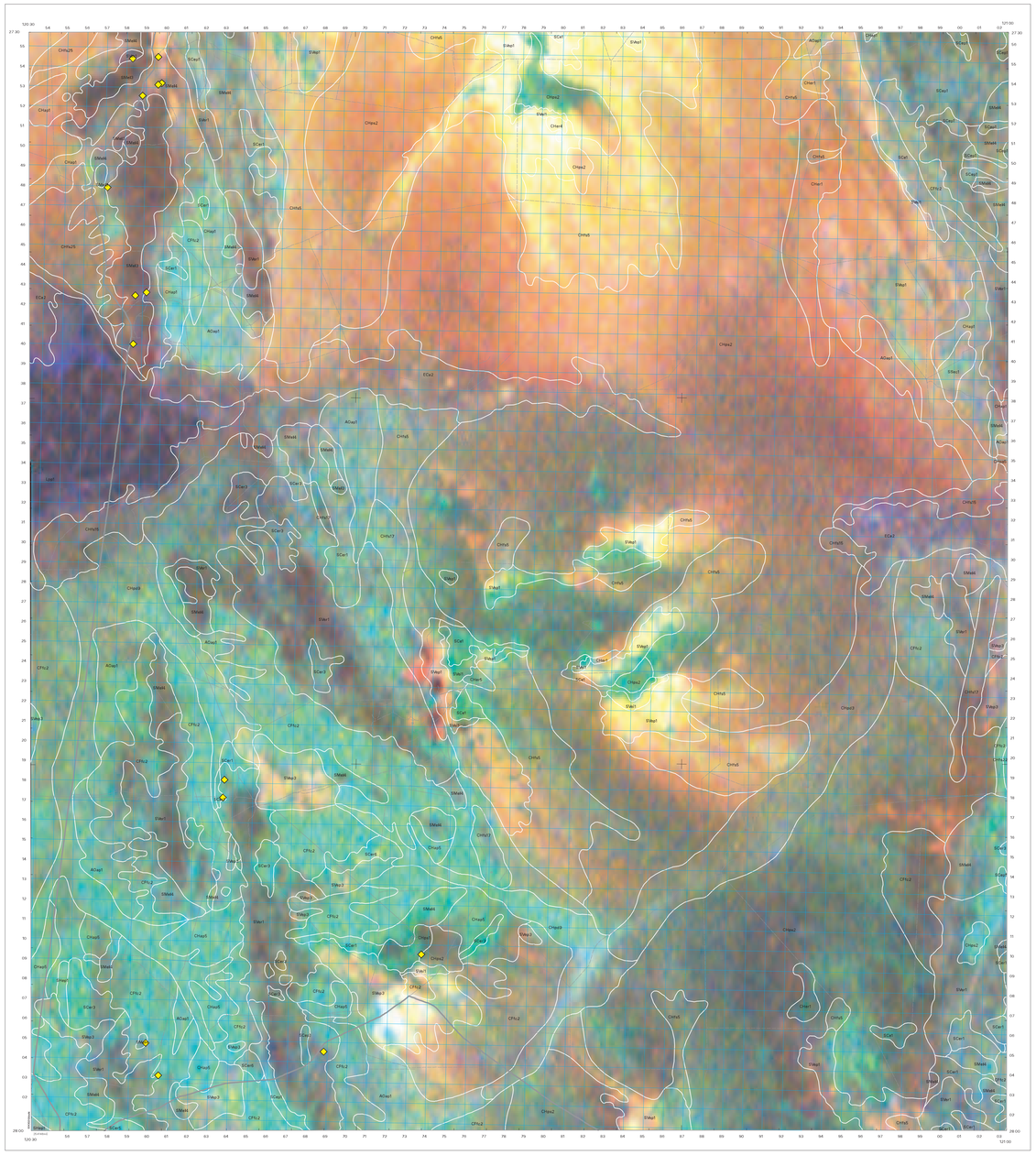
SIR SAMUEL

AUSTRALIA 1:100 000

RADIOMETRIC IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS

SHEET 3042



Transported regolith

Alluvial sediments

AOaf2 — *Overbank deposits*
Fluvial sediments with mainly overbank characteristics. Channel deposits rarer. Extensive clays with interbedded sandy loams, granule, gravel and sandy lenses. Occur on a flat floodplain with some narrow levee banks flanking some channels.

AOae1 — *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 intermixed with the distal portions of sheet flow fan sequences.*

Colluvial sediments

CHep1 — *Sheet flow deposit*
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 pisoliths.

CHep5 — *Granular fine sandy clay to light clays initially as sheet flow deposits now almost completely reworked into low "Wandavira" banks overlying 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 >0.6m 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 profile. 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.*

CHfs17 — *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.*

CHfs22 — *Fine sandy loams to fine sandy clay loams as sheet flow deposits on a very gently inclined plain traversed by a complex pattern of shallow channels. Dominant soils are acid sandy red earths with ferruginous fine gravel throughout and hardpan within 1m. Local patches of salinisation. Ferruginous dark brown to black lag. Mottled and pallid saprolite.*

CHfs25 — *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 zinc-rich parts. 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 broad crests."*

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 with segregations merging into greenstone saprolite and saprock. Polymictic lags vary from fine ferruginous to coarse lithic fragments and locally derived quartz.*

Evaporite

ECa2 — *Calcrete*
Calcrete up to 10m thick, overlain by and interbedded 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

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

In-situ regolith

Saprolite

SCe1 — *Completely weathered bedrock*
Large patches of shallow gritty sand; locally derived colluvium; extensive quartzo-feldspathic grits; boulder and cobble silcrete lag common; extensive pallid saprolite exposures.

SCep1 — *Upper parts of this ferruginous horizon are discontinuous. Duricrusts and iron segregations are common. Upper parts of the residuum are usually thin. 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.*

SCer1 — *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. Rare calcrete, hardpan at 0.5cm, red earths.*

SCer5 — *Thin complex association of ferruginous saprolite and ferruginous mottled zone overlying lateritic residuum on weathered greenstone bedrock. Fluviltric 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

SVel1 — *Highly kaolinized granitic bedrock; rare fresh outcrop; local pockets of colluvial gritty sand; lag consists of quartzo-feldspathic grits and gravel, and some silcrete cobble.*

SVep1 — *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.*

SVep3 — *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. Excellent exposures of iron segregations (massive ironstone). Lags consisting of ferruginous and lithic fragments.*

Highly weathered bedrock

SHep1 — *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

SMdl3 — *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.*

SMdl4 — *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

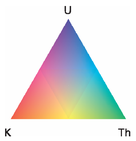
SSe1 — *Saprock extensively developed over greenstone subcrop. Patchy calcrete exposures. Extensive granule sized lag; some narrow alluvial tracts with minor drainage channels in broad drainage floors within a complex array of very low rises and shallow swales. Generally, part of a gently undulating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

MINERAL OCCURRENCE

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

RADIOMETRIC SIGNATURE

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



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 - pools, 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).

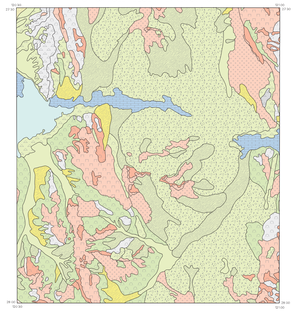
Ferruginous fragments - mixed composition: lateritic residuum, duricrust, fe segregations, Fe-saprolite and Fe stained hardpan.

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

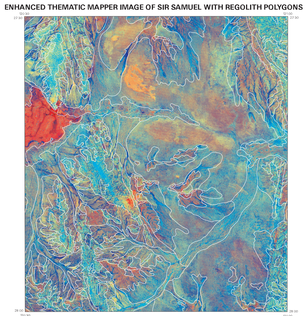
Hardpan - either dominantly siliceous cement and iron stained; or dominantly iron cemented

Highway
Minor road
Vehicle track
Minor administrative boundary
Landing ground

SIR SAMUEL REGOLITH-LANDFORMS

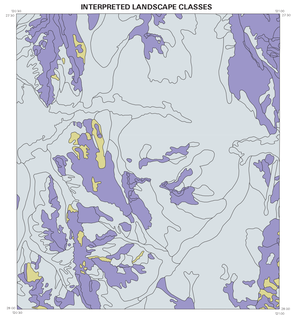


ENHANCED THEMATIC MAPPER IMAGE OF SIR SAMUEL WITH REGOLITH POLYGONS



Red	Clay
Green	Iron Oxides
Blue	Vegetation

INTERPRETED LANDSCAPE CLASSES



Relict
Erosional
Depositional

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

INDEX TO 1:100 000 MAPS
1:250 000 maps shown in blue

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MAP LOCALITY

DATA SETS USED TO CONSTRUCT MAP

A RC9 1:82,000 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

SECOND the DIMILLIN figures of easting and northing. These are for use with the 1:100 000 Series map (Zone 51J). Two UPPER figures of the grid number for example :

E 500 000

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

TO GIVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 100 METRES

SIMPLE FORM — ALL CLOSE WELL

1 Read letters identifying 100 000 metre square in which the point lies.
2 Estimate tenths from scale to point (.317 of point on map) AND figures identifying the line either to the left or right of the point (.3 in this case).
3 Estimate tenths from grid line to point.
4 Locate first HORIZONTAL grid line to the left of the point. Take figures identifying the line in which the left or right margin, or on the line itself.
5 Locate first VERTICAL grid line to point.

SIMPLE REFERENCE — TK4679

If reporting beyond 18 Degrees in any direction, prefix Grid Zone Designator, ie: 51TK4679

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 recurring landform elements with characteristic regolith associations. The map presents a systematic analysis and interpretation of 182 000-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 R. Unsem, AGSO
Produced by AGSO Cartographic Services Unit using ArcInfo software

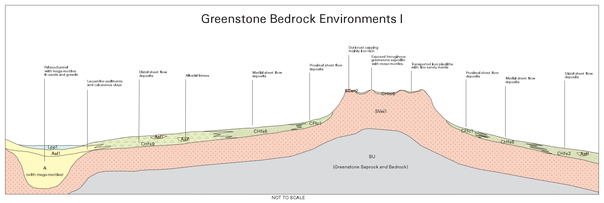
Published by the Australian Geological Survey Organisation, Department of Primary Industries and Energy, Canberra, Australia, issued under the authority of the Minister for Primary Industries and Energy.

Topographic base information © AUSLIG 1993

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

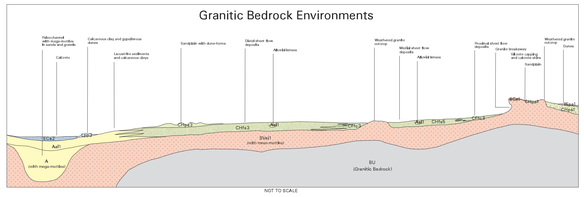
Regional Regolith Associations

Greenstone Bedrock Environments I



NOT TO SCALE

Granitic Bedrock Environments



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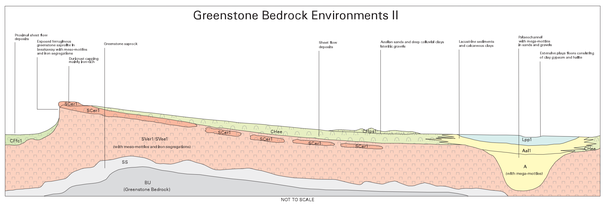
Greenstone Bedrock Environments II



NOT TO SCALE

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 clean 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 copies and as digital data sets.

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SIR SAMUEL

RADIOMETRIC IMAGE MAP with REGOLITH-LANDFORM POLYGONS

SHEET 3042

EDITION 1

January 1998

WARNING: Colours will fade with prolonged exposure to light