

Gawler Craton Regolith Benchmarking: origins, types, utility & where.

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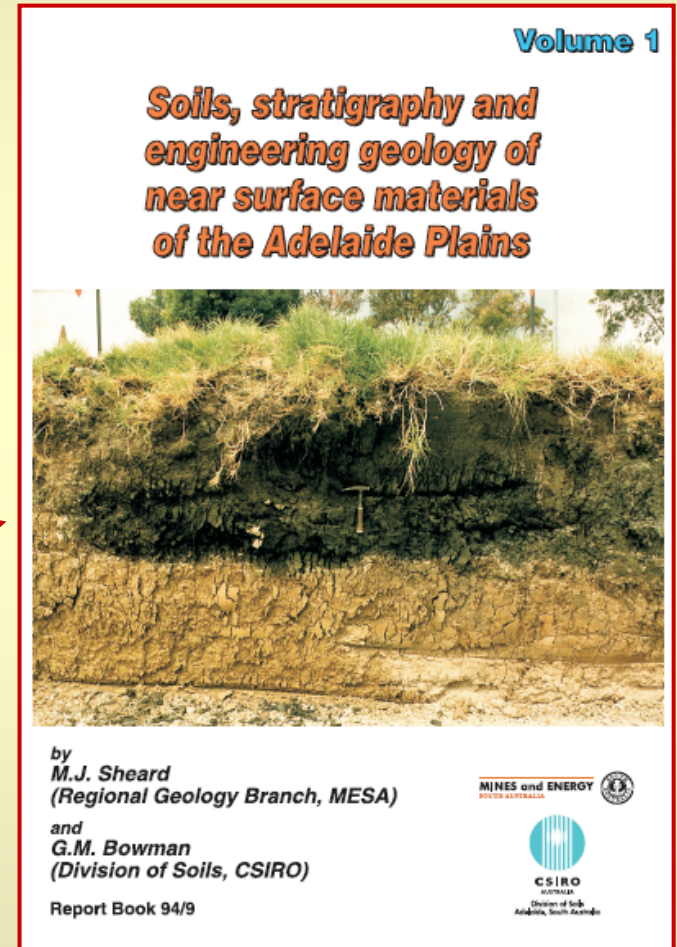
Benchmark Origins

**Used in geomechanics
& pedology: data and
geo-reality references.**

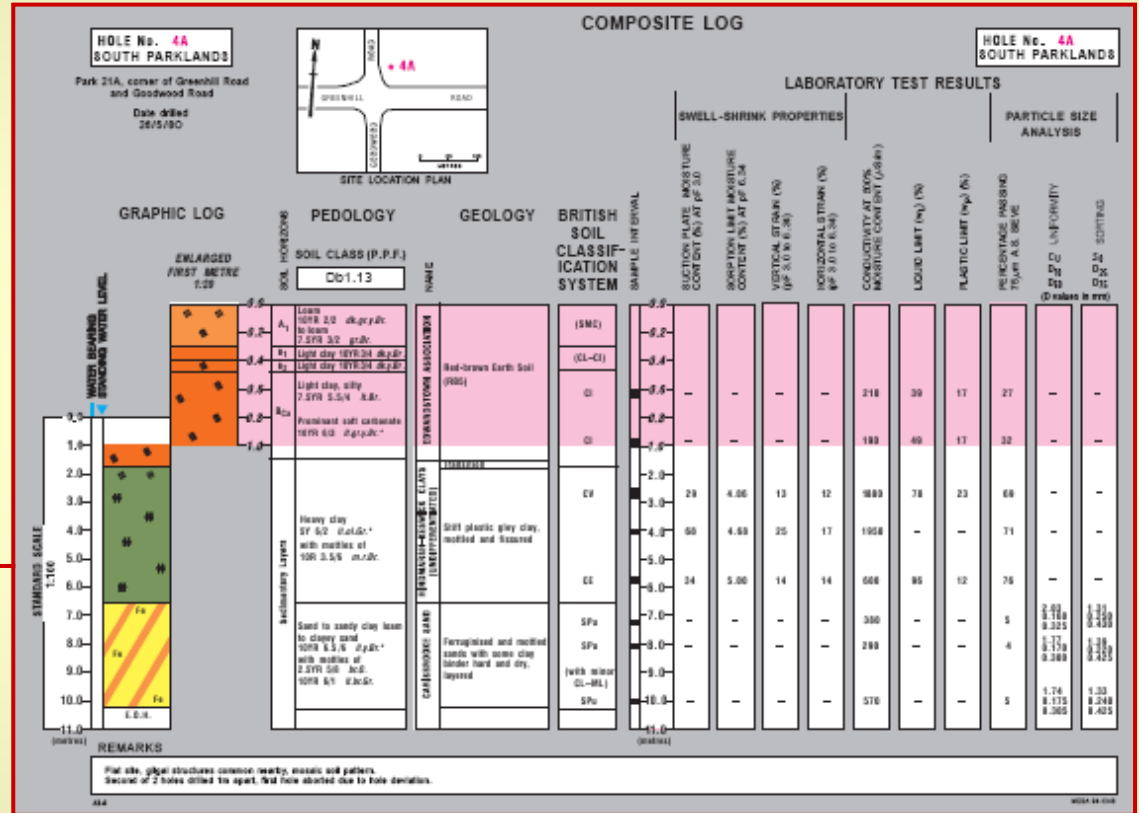
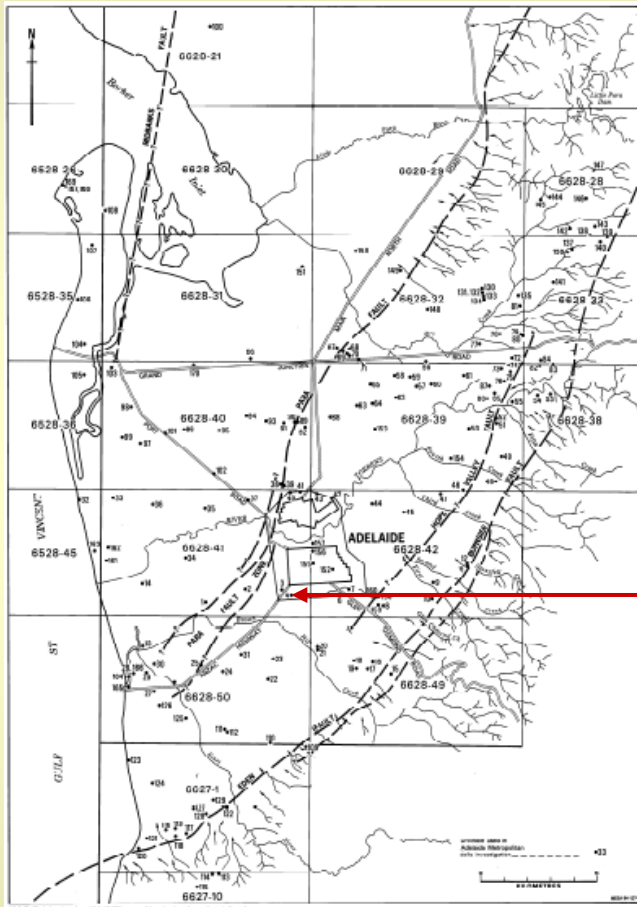
**In Geology = Type Section
Type Drillhole.**

Local example:

**Adelaide soils, geology
& engineering
benchmarks, 1996.**



Adelaide Geotechnical Example



170 cored Benchmarks with Composite Logs.

Regolith Benchmarks

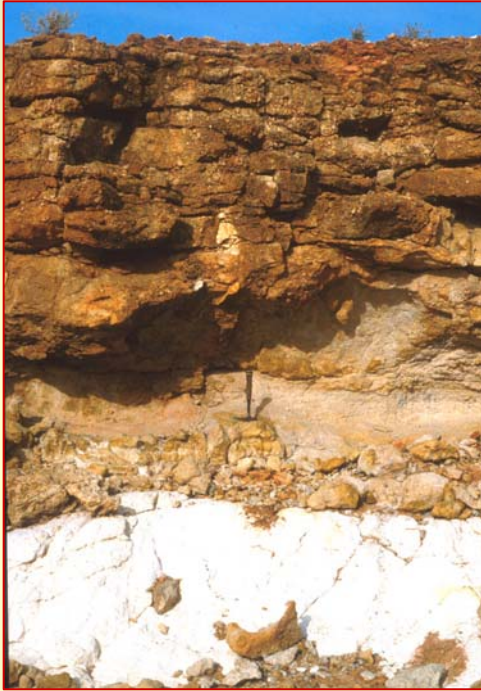
- **Should be representative of local regolith,**
- **Have readily accessible samples / outcrop,**
- **Should be well located & interpreted,**
- **Have consistent presentation over a region or basement domain,**
- **Follow National regolith standards,**
- **Benchmark Atlas Project (06-07) to draw upon open file regolith studies.**

Benchmark Types

- **Type 1: Natural Outcrop,**
- **Type 2: Drilled Profile (cuttings or core),**
- **Type 3: Excavation (mine, pit, quarry, costean, road or rail cuttings & tunnels).**

A Benchmark may be a single type or a composite if no one type provides enough information.

Benchmark Types: examples



Type 1: Outcrop,
Lake Harris, W shore,
Glenloth Granite,
4.5m regolith profile.



Hopeful Hill,
greenstone
cuttings.



Poona Cu-Au Mine,
Moonta Porphyry,
Moonta.

Type 3: Excavation



Type 2: Drilled profiles

Earea Dam
regolith core.

Benchmark Components

Regional location map	Geochemistry
Local site/tenement map + profile-section	XRD results (if available)
GPS coordinates (GDA94)	PIMA results (if available), HyLogger data availability
Site access & owner	Dating (if available)
Related sites	Target elements
Profile photos + logs	Pathfinder elements
Sample storage location	Useful sampling media
Petrology (if available)	Key References

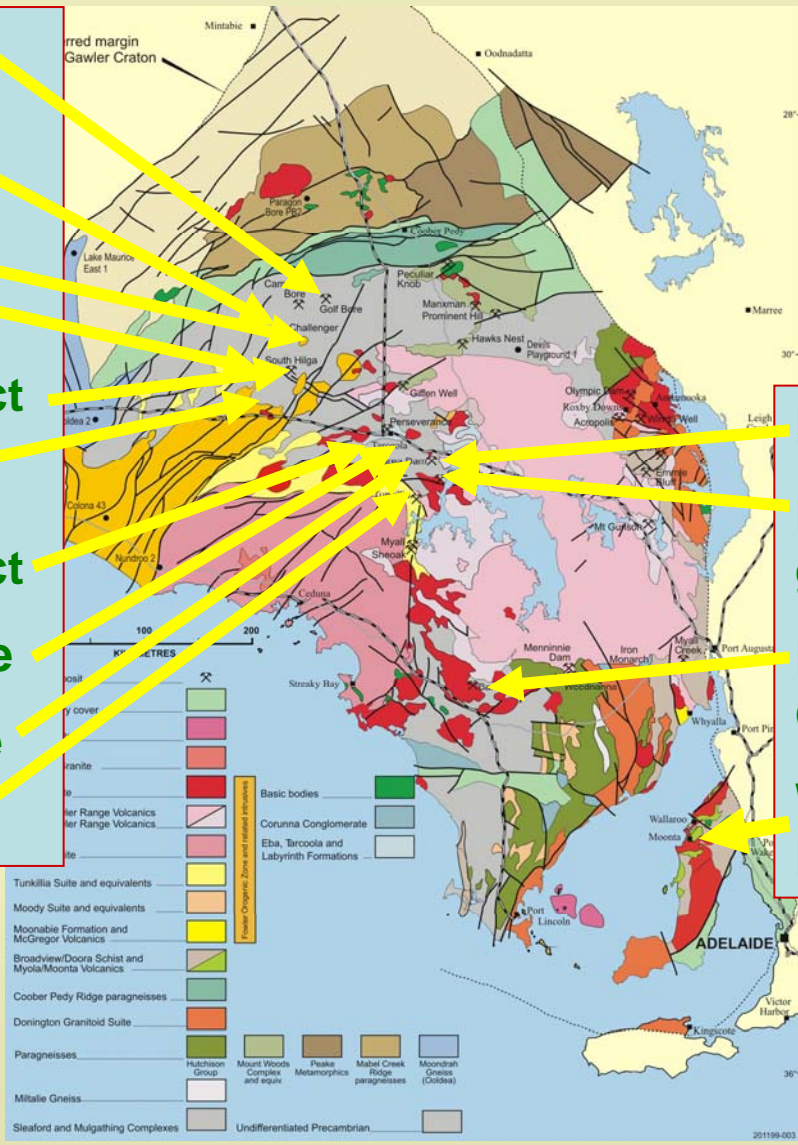
Each Benchmark spans 5-20 pages of text with Figures and Tables

Benchmark Utility

- **Provide:** interpreted representative profiles for in-field comparison, or office-laboratory project planning, or **training geologists new to regolith.**
- **Sites are selected from more detailed studies.**
- **Benchmarks assist field operations by offering consistency in: logs, classification, regolith architecture, appropriate sample media, target & pathfinder element selection.**
- **Samples retained at PIRSA's Drillcore Storage Facility, Glenside (readily accessible).**

Gawler Province Benchmarked sites

- Golf Bore Au prospect
- Challenger Au Mine
- Jumbuck Au prospect
- Monsoon Au prospect
- South Hilga Au prospect
- ET Au prospect
- Boomerang Au prospect
- Mullina Well greenstone
- Hopeful Hill greenstone
- Old Well Au prospect



- Earea Dam Au Field
- Lake Harris greenstone: Ni, Cr, Au
- Barns & Baggy Green Au prospects
- Wheal Hughes & Poona Cu-Au Mines

Regolith Benchmarks: comments

Pilot Project has uncovered some limitations:

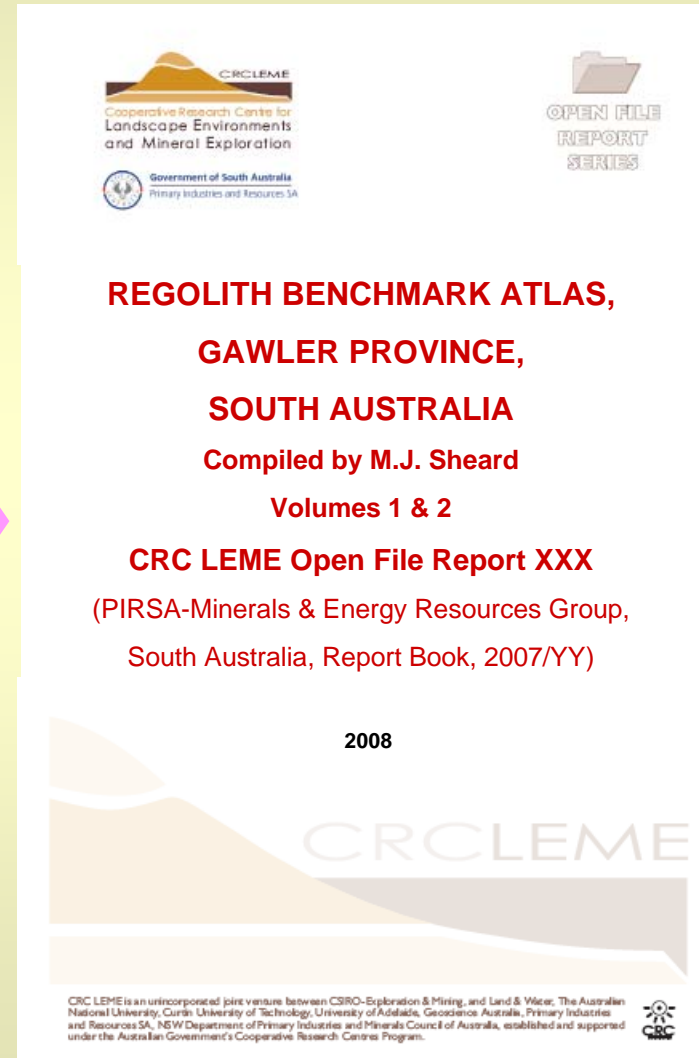
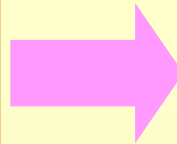
- Gawler Craton Benchmark distribution not ideal,
- Many regolith terranes are not represented,
- Numerous target elements, other than Au, are poorly represented.

Positive outcomes to Pilot Project:

- Relatively standardised approach across several basement domains has yielded **33 Benchmarks**,
- A useful format is established for additional benchmarking, and that could be applied to the Curnamona, Musgrave & Adelaidean Provinces.

Benchmark Atlas Pilot Project Output

**A CRC LEME
2 Volume
Open File Report
33 Benchmarks
from 16 studies.**



Contributors

The huge input from all Gawler Craton regolith investigators & the many CRC LEME scientists who provided data, interpretations, maps, reports, theses, papers & samples is acknowledged.

Of special note are my long-term office, field and lab. collaborators:

Mel. Lintern and George Gouthas.

