YARDEA

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES AND ENERGY, ADELAIDE

AUSTRALIA 1:250 000

S.A. GEOLOGICAL ATLAS SERIES SHEET SI 53-3

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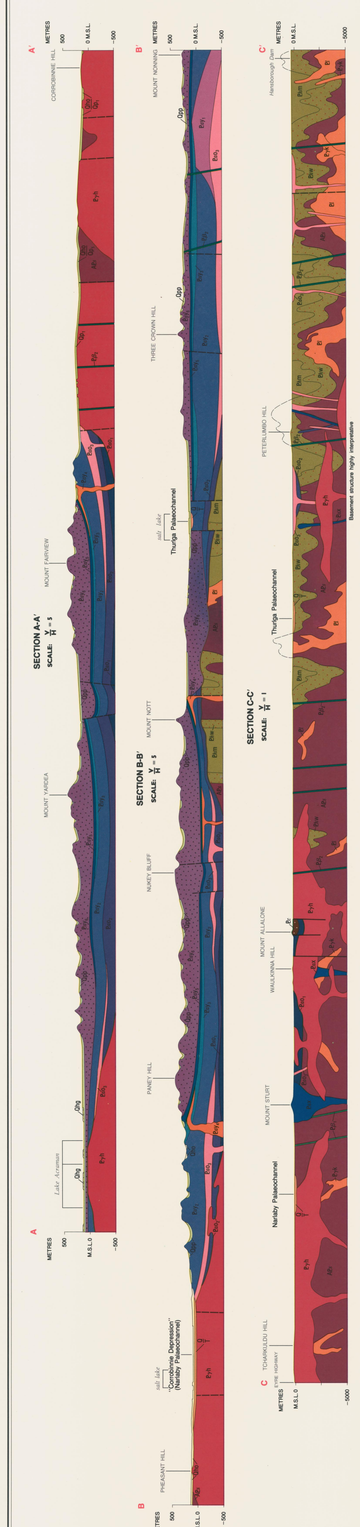

SCALE
1:250 000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

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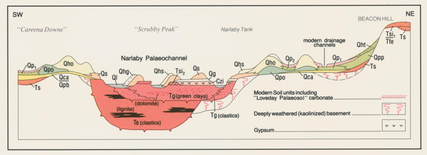
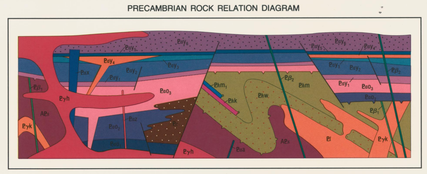
TERTIARY-QUATERNARY ROCK RELATION DIAGRAM



PRECAMBRIAN ROCK RELATION DIAGRAM



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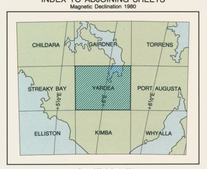
Magnetic Declination 1980



Annual Variation +1'

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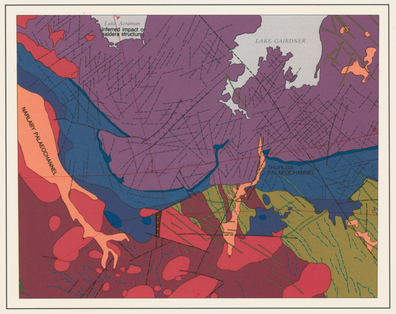
TECTONIC SKETCH



REFERENCE

CAINOZOIC

QUATERNARY

HOLOCENE

Qhl — Talus and downwash on GAWLER RANGE VOLCANICS and WARROW QUARTZITE (Ethw).

Qhs — Aeolian quartz-sand dunes and spreads. Where thin, shown as overlay on underlying unit.

Qhg — Gypsiferous, aeolian, quartz-sand dunes fringing playa lakes; spreads of white to pale yellowish-brown sandy silt and clayey sand with powder gypsum and gypsum crusts within depressions around the lakes. Includes gypsiferous silt and sand of Pleistocene age.

Ql — Saline and gypsiferous playa lake deposits. May be Pleistocene in part.

Qho — Vegetated quartz sef dunes and sand spreads (MOONAIBA SAND). Partly reworked to form thin cover of Qhs.

Qs — Brown and yellowish-brown, fine- to medium-grained aeolian sand spreads within depressions surrounding playa lakes.

PLEISTOCENE

Qp_2 — Deep reddish-brown ferruginous sands, clayey grit and sandy clay with fragments of hematite-cemented gritty sand. Rounded hematitic and goethitic "buckshot" gravels in places. Some rounded fragments of iron-stained silcrete. Possibly related in part to the CALLABONNA CLAY.

TQpo — Thin brown, yellowish-brown and reddish-brown clayey sand and silt. Probably reworked BRIDGEWATER FORMATION. (?WIABUNA FORMATION equivalent).

Qpp — Within and flanking the Gawler Ranges, and on the margins of outcropping Proterozoic rocks farther south (equivalent of the POORAKA FORMATION): Reddish-brown and yellowish-brown gravelly and sandy clay, silt and sand with soft earthy carbonates [?LOVEDAY PALEOSOL?.] Hard calcrete nodules and BAKARA-type calcrete in lower part. Indeterminate boundary with Qp.

Qp_1 — South of Gawler Ranges. Thin, reddish-brown, orange-brown and yellowish-brown loamy sand, sandy and gravelly clay with nodules of calcrete and rubbly BAKARA-type calcrete.

Qg — Older gypsite and crystalline gypsum formed on ILKINA FORMATION in depressions surrounding playa lakes SW of the Gawler Ranges. (Stratigraphic position uncertain).

Qca — Spreads of nodular, platy and blocky calcrete (?BAKARA CALCRETE). Rests on hard, massive calcrete (?RIPON CALCRETE) in the Minnipa area and S of "Buckleboo".

Qpb — BRIDGEWATER FORMATION (Upper Member): Pale yellowish-brown, cavernous-weathered gritty sand with worm burrows and coprons of *Leptopus dupont*i at edge of salt lake 8km SE of Mt Sturt.

TERTIARY

PLIOCENE

Tzi — ILKINA FORMATION: Laminated white and yellowish-brown ferruginous sand with bands of crystalline gypsum, pale green gypsiferous sandy and gritty clay, and silt.

Tfe — Cavernous and rubbly hematitic, limonitic and goethitic laterite up to 1m thick, capping ferruginous gravels, sands and silts. Pisolitic hematite and goethite in quartz grit in places. Fragments of quartz, dacite and silcrete up to 3cm across in hematitic matrix on W shore of Lake Acraman.

PLIOCENE-EARLY PLEISTOCENE

Tk_2 — Dark grey chalcedonic silcrete formed on GARFORD FORMATION equivalent in depressions around playa lakes near "Scrubby Peak". Silicified sand and feldpathic grit 9km SE of Mt Sturt.

Tg — Khaki-coloured, greenish-grey and brown clay, silt and sand with bands of white gypsum (silcrete in places), and flaggy, laminated sand capped by silcrete on the shores of playa lakes in depressions SW and S of the Gawler Ranges. Blue-grey, green-grey and grey clay at depth in Carpentaria borehole RD (R 42. (GARFORD FORMATION equivalent).

MIOCENE-EARLY PLIOCENE

Tsi_1 — "Terrazzo" – type silcrete, generally less than 1m thick, with angular fragments of quartz in a cryptocrystalline siliceous matrix. Forms capping to GAWLER RANGE VOLCANICS W of Lake Acraman and E of Lake Gairdner, on ?LINCOLN COMPLEX NW of Mt Sturt, and on silicified Tertiary sediments, gritty sand, grit and silt overlying WARROW QUARTZITE and gneiss of the SLEAFORD COMPLEX S of the Gawler Ranges.

Ts — Ferruginous, pebbly, quartzose grit E of Lake Gairdner. Conglomerate on Beacon Hill containing rounded pebbles and cobbles of quartzite and volcanics (?GAWLER RANGE VOLCANICS) up to 15cm long. S of Gawler Ranges, yellow-brown and red-brown weathered quartzose grit and fine sandstone, pebbly in places. Silicified where capped by Tsi_1.

MIOCENE-EARLY PLEISTOCENE

Te — PIDINDA FORMATION: Fine- to coarse-grained grey, brownish-grey, dark brown and dark grey carbonaceous and pyritic sands and clays intersected in bore -holes in SW portion of map area. (Subsurface only).

GEOLOGICAL BOUNDARY
OBSERVED
INFERRED

FAULT
INFERRED

BEDDING
INCLINED
VERTICAL
INCLINED (INFERRED FROM COLLUMNAR JOINTING)

FOLIATION
INCLINED
VERTICAL

FLOW BANDING
INCLINED
VERTICAL

JOINTING
INCLINED
VERTICAL
TREND OBSERVED ON AERIAL PHOTOGRAPH

CLEAVAGE
INCLINED
VERTICAL

SHEARING
INCLINED
VERTICAL

FOLDS
MESOSCOPIC FOLD – F_{2-3} SHOWING VERGENCE – AND L_{2-3} QUARTZ ROD LINEATION
SYNFORM
ANTIFORM

QUARTZ REEF

GEOCHRONOLOGY SAMPLE SITE WITH REFERENCE NUMBER — ⊕ 6132 R6 54

ALLUVIAL FAN

GEOLOGICAL SECTION — A A'

HIGHWAY, MAIN ROAD
SECONDARY ROAD
TRACK
NATIONAL ROUTE NUMBER — 1
RAILWAY
PASTORAL BOUNDARY FENCE
HOMESTEAD — "Yardea"
BUILDING
LANDING GROUND — LG
YARD — Yd
TRIANGULATION STATION
IDENTIFIED POINT
SPOT HEIGHT (ELEVATION IN METRES) — 278

PROTEROZOIC

MIDDLE PROTEROZOIC

GAWLER RANGE VOLCANICS

Ethw — Pink to pale reddish, fine- to coarse-grained, leucocratic graphic granite and adamellite with veins of microgranite, aplite and pegmatite. Accessory zircon, allanite and interstitial fluorite. Radiometric age: (Rb-Sr) 1478±38 Ma (Hillaba-Minnipa area) and 1477±34 Ma (Buckleboo area); (U-Pb) 1514±16 Ma (Hillaba area).

"Tidnacarb" SUITE

$?Ethc_1$ — Porphyritic rhyodacite 5km NW of Peterlumbo Hill. Probably NNW – trending dyke.

"YARDEA" SUITE

Eyh — YARDEA DACITE: Massive porphyritic dacite and rhyodacite. Cream-coloured, brown and pink phenocrysts of plagioclase up to 1cm across, generally sericitised and rounded. Coarse-grained granophyric intergrowths of quartz and cryptic and clinopyroxene altered to secondary amphibole and chlorite occur in a reddish-brown, finely-granular felsic matrix. Carries xenoliths of gneissic granite up to 3m x 2m across in Yarna-Hillaba area.

Rhyolitic tuff within sequence W of Lake Acraman.

At base of YARDEA DACITE: Intensely-welded, black, dark grey and reddish-brown mottled, porphyritic dacite and rhyodacite with bands of black obsidian. Cream-coloured and pale brown phenocrysts of plagioclase (≤ 3mm across) and K-feldspar, with smaller phenocrysts of quartz and clinopyroxene altered to secondary chlorite. Fine-grained aphanitic to granular matrix. Rare glass shards and faint layering in places. Radiometric age: (Rb-Sr) 1529±33 Ma; (U-Pb) 1592±3 Ma.

Eyh_2 — PANEY RHYOLITE: Pale reddish-brown, pale green and buff-coloured, yellowish-brown weathered, fine-grained to coarsely-porphyritic rhyolite with phenocrysts of K-feldspar and quartz altered to fine-grained sericite and mica. Much flow-banding with fiamme in places. Grades to rhyodacite with some plagioclase phenocrysts and less-abundant quartz. Probably a series of lava domes and associated welded ash flows.

"YTUNKARNI" SUITE

Eyk_1 — YANNABIE RHYODACITE: Mottled reddish-brown and yellowish-brown, fine-grained to porphyritic rhyodacite with phenocrysts of plagioclase, K-feldspar and some spherical quartz, in a suffaceous and vesicular matrix carrying amygdales of quartz. Grades to rhyolite with more abundant quartz phenocrysts.

Eyg_1 — EUCARRO DACITE: Massive porphyritic dacite grading to rhyodacite with scattered spherical quartz phenocrysts. Brown and cream-coloured phenocrysts of plagioclase about 5mm across, minor K-feldspar, and clinopyroxene altered to chlorite and epidote are set in a mottled reddish-brown and dark green, finely-granular or granophyric matrix of K-feldspar and quartz with patches of epidote or chlorite. Dark grey, densely-welded dacite occurs at or near the base NW of Nariaby Well and NNW of Waulkinna Hill.

Eyg_2 — Unnamed highly-porphyritic dacite (Eax) at Mt Sturt and in surrounding area; dykes intruded into ?Pt-k 14km E of Mt Sturt, into BITTALI RHYOLITE 10km SW of Peterlumbo Hill, into BITTALI RHYOLITE and ?Pt 3km SE of Peterlumbo Hill (possibly feeder dykes to EUCARRO DACITE or YARDEA DACITE).

GAWLER RANGE VOLCANICS

Eyb_1 — NONNING RHYODACITE: Massive porphyritic rhyodacite to dacite. Phenocrysts of pink and cream plagioclase up to 1cm across, smaller K-feldspar crystals, clinopyroxene altered to chlorite, calcite and iron oxides, and round quartz are set in a reddish-brown, granophyric or microgranular felsic matrix.

Eyb_2 — BITTALI RHYOLITE: Variable assemblage of pale yellowish-brown weathered, grey, pale green, pale brown and reddish-brown rhyolite and rhyodacite. Intrusive feeder dykes and welded ash flows with flow-banding, fiamme and pumiceous streaks. Texture ranges from fine-grained to porphyritic with phenocrysts of K-feldspar, plagioclase and round quartz. Lines of siliceous geodes occur parallel with layering 1km SE of Victory Dam (SW of "Nonning").

"COLLERY" SUITE

Eyd_1 — WAGANNY DACITE: Reddish-brown porphyritic dacite to rhyodacite, with phenocrysts of plagioclase and minor K-feldspar up to 2mm across, in an aphanitic or microgranular matrix. Assemblage includes dark greenish-grey, sparsely-porphyritic dacite and andesite 8km NW of "Buckleboo"? Radiometric age of WAGANNY DACITE equivalent (Toontulya Bluff, STREAKY BAY 1:250 000 Sheet): 1591±3 Ma (U-Pb).

Eyd_2 — Unnamed porphyritic rhyolite underlying WAGANNY DACITE in narrow saddle 6km NE of Mt Sturt and forming isolated hill to SE. Pale greenish-grey rhyolite cropping out 10km WNW of "Buckleboo" may be in same stratigraphic position.

Eyd_3 — N-S trending dyke of andesite 10m wide intruded into ?APk 10km SE of Mt Sturt. Possibly feeder dyke to "OLDER" GAWLER RANGE VOLCANICS.

?MIDDLE PROTEROZOIC

?Ec — CORUNNA CONGLOMERATE: SW of "Paney", pale yellowish-brown and reddish-brown weathered, brecciaconglomerate and pebbly quartzite with dark heavy-mineral banding. Well-rounded to angular pebbles and cobbles up to 15 cm long, consisting of milky quartz, red jasper, quartzite, black slate and fine-grained dark greenish-grey mafic igneous rock. Veins of milky quartz.

Ep_1 — Metadolerite dyke intruding ?Pt-k 17km NW of "Scrubby Peak"; dykes or plugs intruded into ?APk c. 4km SE of Mt Sturt.

EARLY PROTEROZOIC

LINCOLN COMPLEX

Eyk — ?Synorogenic granitoids. Brecciated and silicified leucocratic riebeckite granite 17km NW of "Scrubby Peak"; mottled cream-coloured, brown and dark grey granite 8km NW of Mt Sturt, and massive to weakly-foliated granite intruded by porphyritic dacite (Eax) 3km SE of Waulkinna Hill.

Ei — Undifferentiated. Includes foliated gneissic granite and granodiorite, synorogenic medium- to coarse-grained massive leucocratic granite with veins and bands of pegmatite and aplite, slightly foliated in places, and foliated quartz-feldspar-mica gneissic granite. May include remnants of SLEAFORD COMPLEX and HUTCHISON GROUP.

MIDDLEBACK SUBGROUP

HUTCHISON GROUP

Ehm — MIDDLEBACK SUBGROUP – undifferentiated: (Includes KATUNGA DOLOMITE, LOWER MIDDLEBACK JASPILITE, COOK GAP SCHIST and UPPER MIDDLEBACK JASPILITE equivalents in area NE and E of "Buckleboo"). Reddish-brown and yellowish-brown weathered, ferruginous, dark grey to grey quartz-mica schist and graphite schist, with bands of quartzite and jaspilite (equivalent of LOWER MIDDLEBACK JASPILITE and COOK GAP SCHIST) also present within syncline 15km E of "Paney".

Ehm$_1$ – Actinolite-grunerite-magnetite schist (near Ultima Dam) and fine-grained, thin-bedded magnetite-amphibolite quartzite (?chert), equivalent either to LOWER MIDDLEBACK JASPILITE or UPPER MIDDLEBACK JASPILITE.

Ehk — Garnetiferous diopside (+ tremolite) marble near Ultima Dam, and massive, white to pale grey marble (possibly equivalent to the KATUNGA DOLOMITE). Usually silicified and brecciated at the surface (e.g. W of Peterlumbo Hill).

Ehw — WARROW QUARTZITE: Pale yellowish-brown weathered, massive and foliated, white, pale grey and cream-coloured, medium- to coarse-grained quartzite, locally with glassy or milky quartz matrix. Pods and veins of milky quartz occur along fracture planes.

ARCHAEAN

SLEAFORD COMPLEX

Asf — Undifferentiated. Includes foliated quartzofeldspathic gneiss and gneissic granitoids with deformed veins and pods of milky quartz and pegmatite. Also includes quartzofeldspar-biotite gneiss, augen gneiss with garnet locally, and migmatitic garnetiferous gneiss.

CONTOUR (INTERVAL 50 METRES) — 250
SAND DUNE
EPHEMERAL STREAM
FLOOD PLAIN
PLAYA LAKE
CLAYPAN, SALTPAN
SWAMP
STRATIGRAPHIC BORE
BORE, WELL — W
DAM
TANK — T
WATERHOLE — W.H.
ROCKHOLE — R.H.

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Transverse Mercator Projection. Australian Geodetic Datum, 1966.

YARDEA
SHEET SI 53-3