AQUA PROJECT
Summary of Gravels Sampled on EL24512

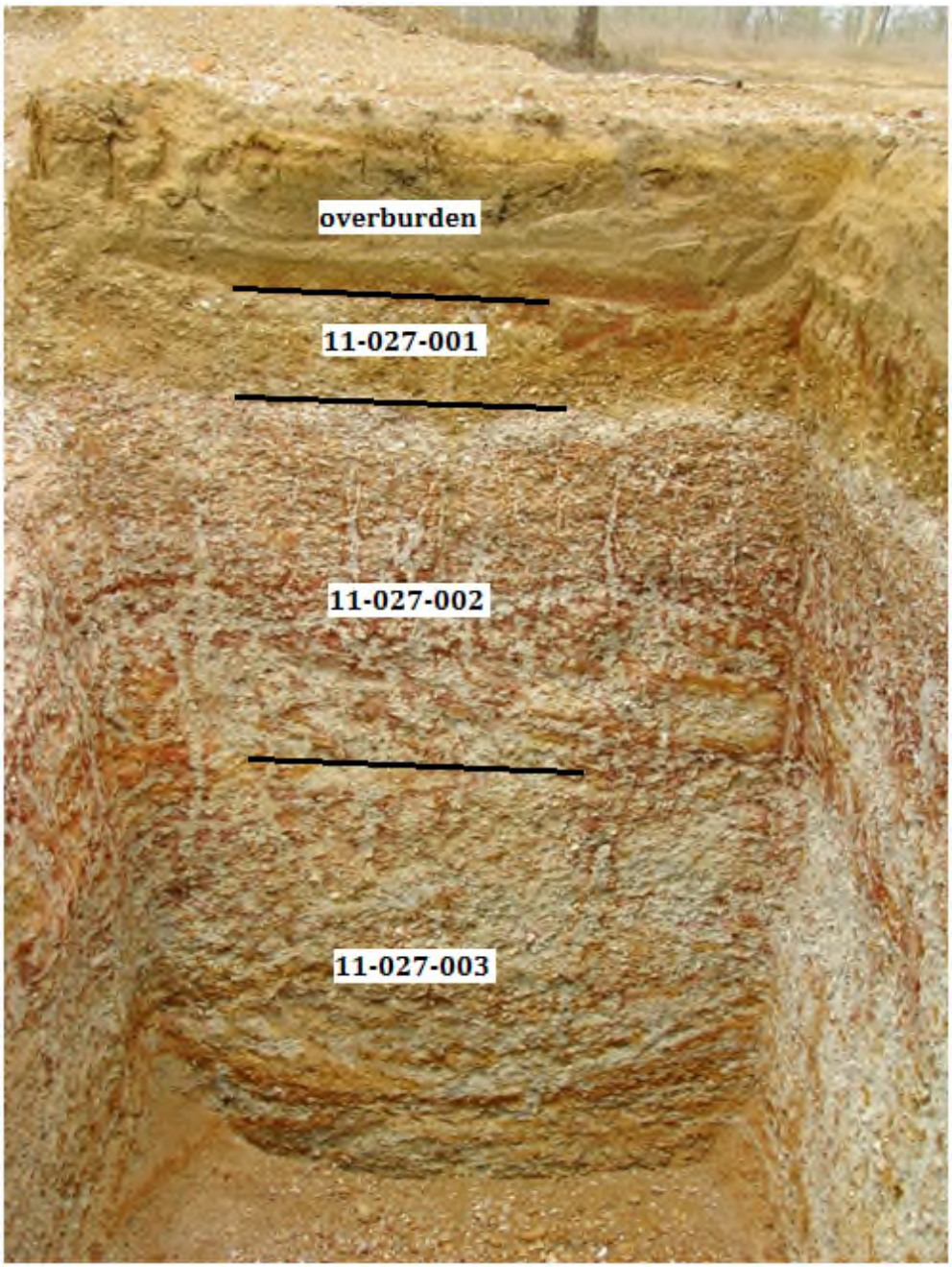
Bulk Sample Pits

Datum – GDA94 zone 53

Pit 1

Centroid - 642313E 8215992N

Pit reached 8.5m depth, with total gravel thickness of about 7m.
Overburden thickness varies from 1m to 2.3m and comprised clayey sand and lateritised clayey sand. Overburden is thicker where the upper gravel has been removed.



Profile down Pit 1

Three samples were taken down the profile.

Sample 11-027-001 – upper sample

Total tonnes sampled = 163t
Average thickness = 0.8m

Northern wall - Pit 1

The upper sample comprised patchy gravel that doesn't cover the entire pit surface area. Probably reworked gravel from further upstream. Overlying the gravel is medium-coarse clayey sand which is lateritised. Gravels have an irregular upper contact onto a mostly planar upper contact with the gravel below (11-027-002). Gravels are goethite-stained, poorly-sorted with clasts to 12cm, most are 2-5cm and with a clayey gritty sand matrix. Clasts are mostly subrounded to rounded and comprise grey chert + Ye fg sandstone + silicified siltstone.

Sample 11-027-002 – middle sample

Total tonnes sampled = 521t
Average thickness = 3.0m

The upper portion of this horizon is finer and matrix-supported. Clasts to 10cm, most 2-5cm with white, clay-rich-sandy matrix. The lower portion is coarser with large-scale cross-bedding visible in the western face. Clasts are mostly Ye fg sst + Rd med sst + Gy chert + silicified dolomite and are coated in white clay. Coarser lower portion of the unit has clasts to 15cm with clay-rich sandy matrix and haematite mottled iron staining. Discontinuous orange med-grained sand horizons separate this unit from the sample unit below.

Sample 11-027-003 – basal sample

Total tonnes sampled = 443t
Average thickness = 3.3m

The upper portion of this horizon has large-scale cross-bedding visible in the southern face.

Upper portion of basal gravel - Pit 1

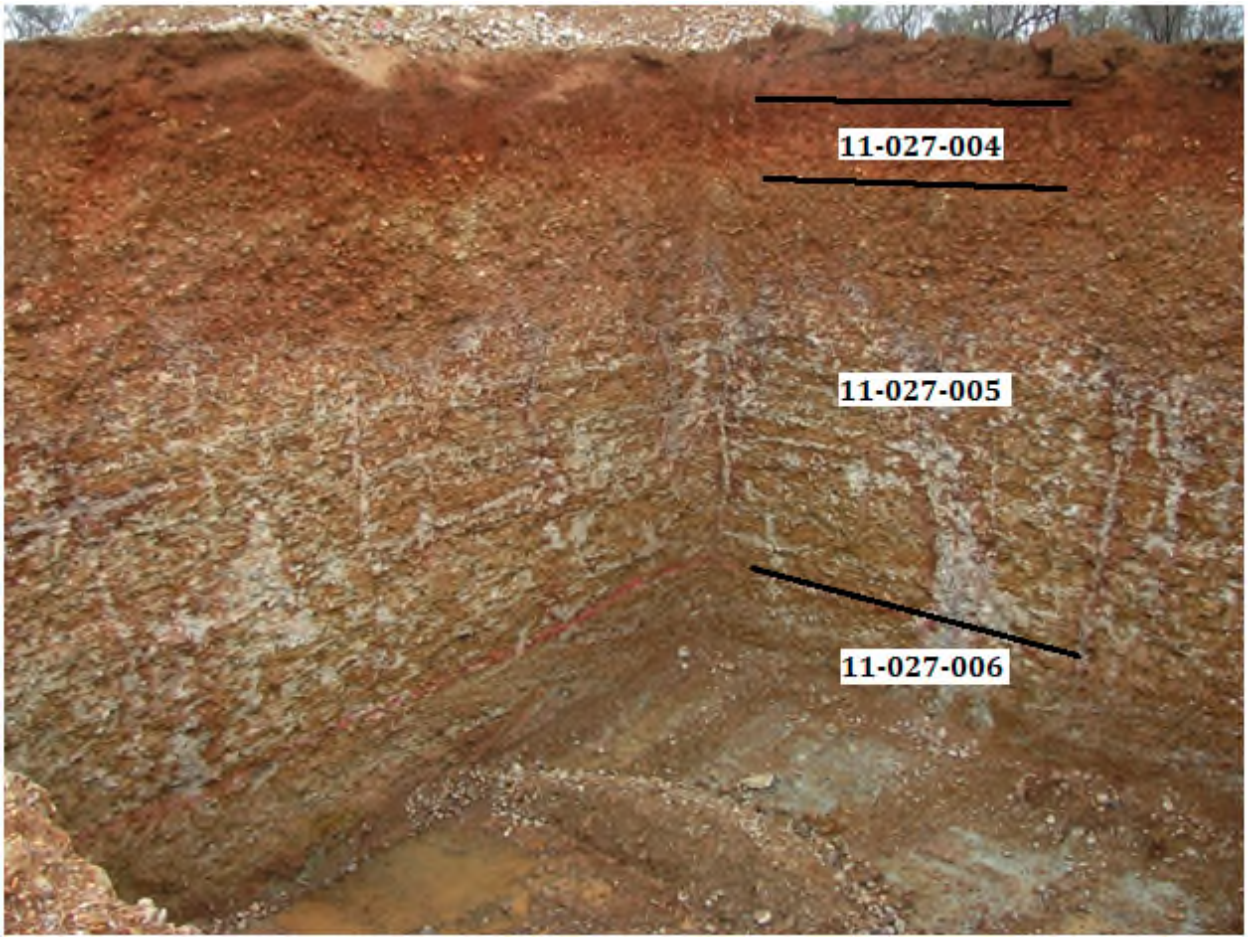
The basal portion is planar-bedded and coarse, especially near the bedrock contact. Clasts range in size from 2 to 15cm, with some to 30cm. Clast types include Gy chert + fg Wh/Ye well-sorted sst + PkGy quartzite + silicified YeOr siltstone. Matrix of the basal portion is sandier with greenish colouration near bedrock contact.

Lower portion of basal gravel - Pit 1

Pit 2

Centroid - 642027E 8215456N

Pit reached 6.7m in depth, with a total gravel thickness of about 5.7m
Overburden thickness is about 0.9m, and comprised lateritised OrRd clayey sand with minor small cobbles.



Profile down Pit 2

Three samples were taken down the profile.

Sample 11-027-004 – upper sample

Total tonnes sampled = 330t
Average thickness = 1.5m

Sample comprised lateritised poorly-sorted gravels. Clasts are mostly 2-8cm, with some to 20cm. Clasts are mostly Gy chert + silicified dolomite + silicified siltstone + med sst + Ye fg sst, with sandy-clay gritty matrix. Unit varies in thickness but averages about 1.5m.

Sample 11-027-005 – middle sample

Total tonnes sampled = 616t
Average thickness = 3.1m

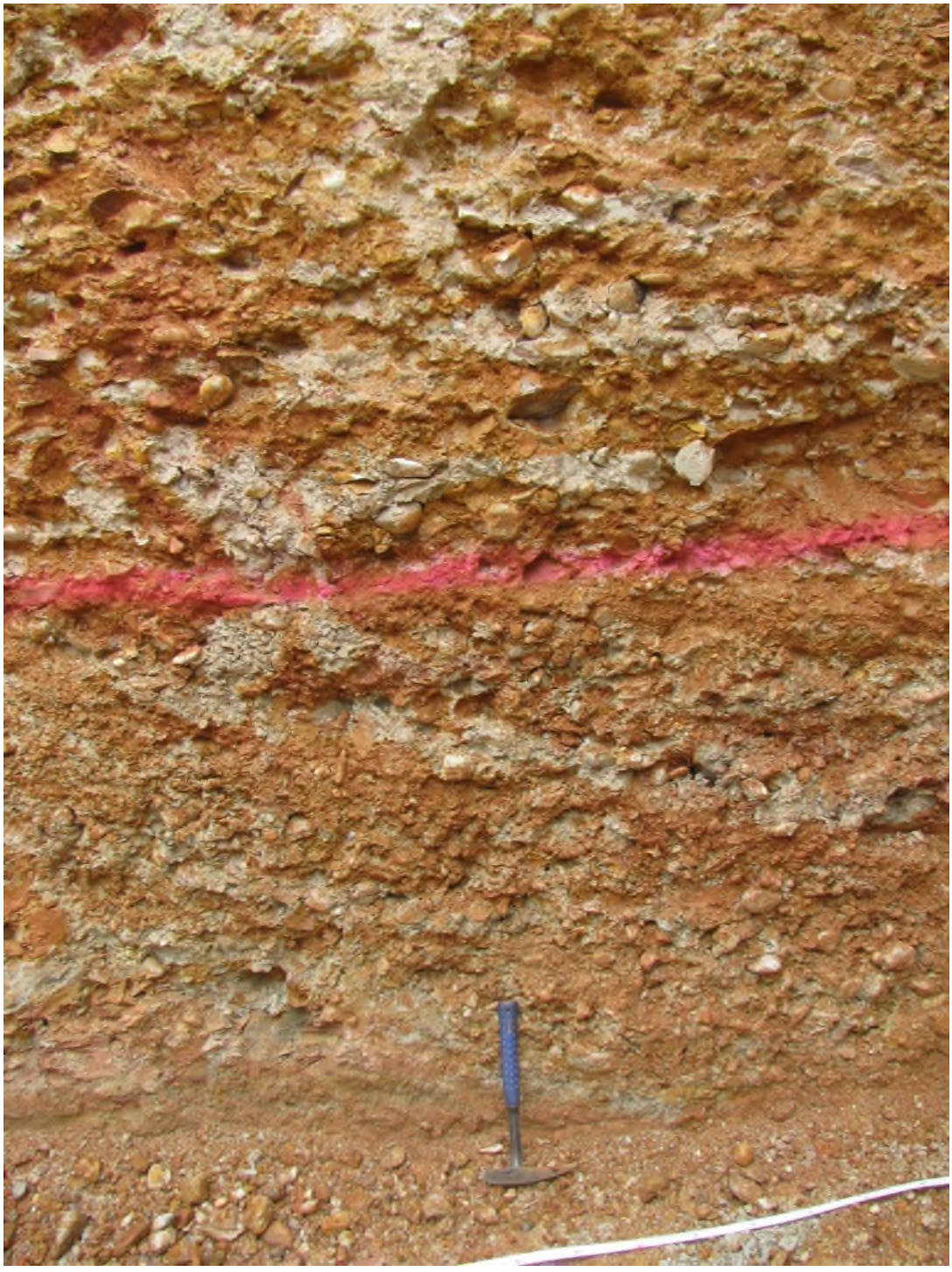
Sample comprises coarse gravel with white clay-rich matrix. Clasts are white-coated and range from 2-10cm, with some to 25cm. Clasts are mostly sub-rounded to rounded and include quartzite + silicified siltstone + Ye fg sst + Gy chert + clasts of grit/peddle conglomerate. This gravel has significantly more sandstone + quartzite than the gravels in Pit 1.

Middle gravel - Pit 2

Sample 11-027-006 – basal sample

Total tonnes sampled = 206t
Average thickness = 1.1m

Basal gravel is finer with a clayey sandy matrix with green-coloured clay reflecting proximity to bedrock (green/red-brown Proterozoic shale). Clasts are less than 10cm, most being 2-5cm, and are mostly rounded to well-rounded. Clast lithology includes Pk quartzite + fg laminated sst + silicified siltstone. Bedrock contact is not planar, it is undulating with bedrock highs and potholes.

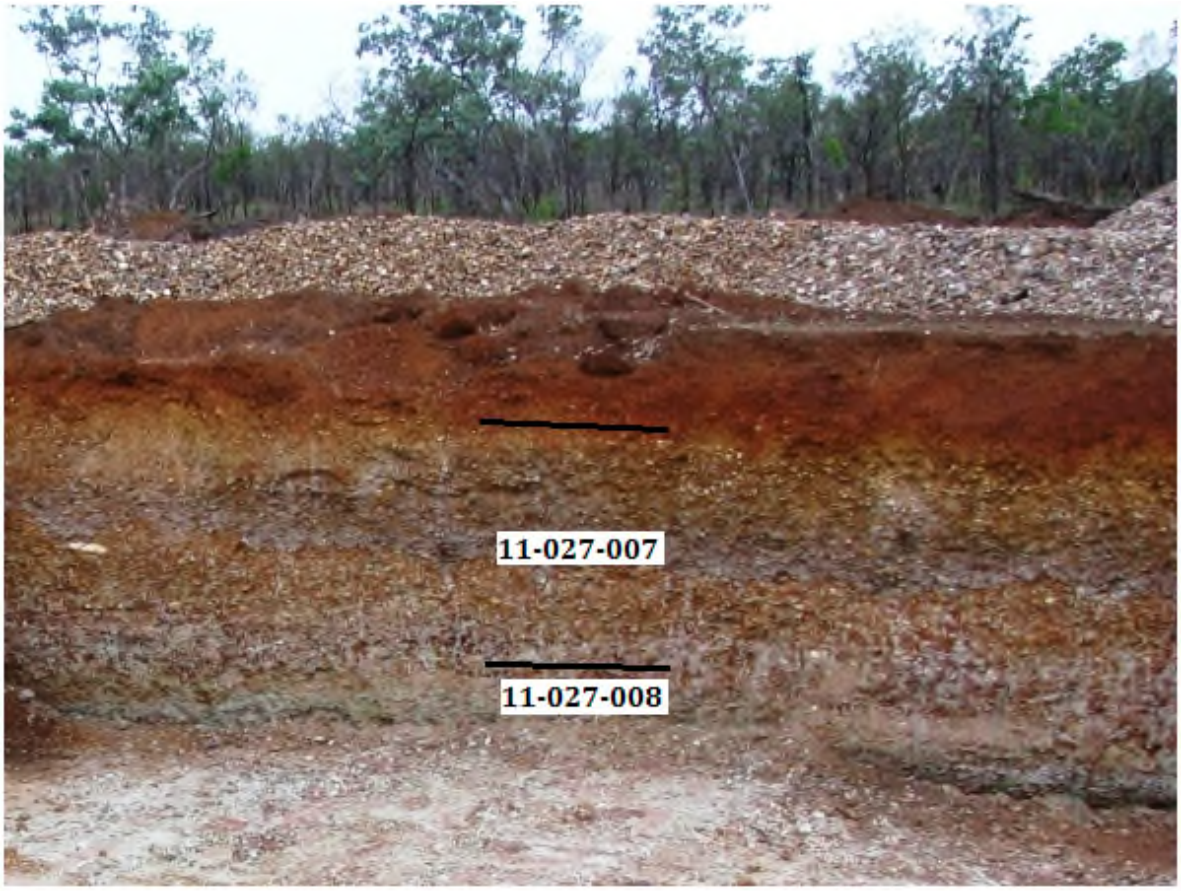


Basal gravel - Pit 2

Pit 3

Centroid - 640216E 8213483N

Pit reached ~3.5m in depth, with a total gravel thickness of 2.7m
Overburden thickness was about 0.8m, and comprised lateritised m-cs quartz OrRd clayey sand with minor small cobbles and an undulating diffuse basal contact.



Profile down Pit 3

Two samples were taken down the profile.

Sample 11-027-007 – upper sample

Total tonnes sampled = 831t
Average thickness = 1.8m

This sample comprised three discrete gravel horizons. The upper horizon was about 0.4 to 0.5m thick and comprised clast-supported fine gravel of pebbles to about 40mm. Clast lithologies included flat fg sst, sub-angular chert and medium-grained sst/Fe-sst. The unit is partially lateritised with a Fe-mottled sandy gritty matrix.

Underlying this pebble gravel is coarse clast-supported gravel with clasts to 20cm, most 2-10cm. Clasts types include Gy chert + quartzite + coarse Fe-sst + Ye fg laminated sst with gritty Fe-mottled sandy clay matrix.

Upper gravel sample - Pit 3

The third gravel is also clast-supported and coarse with clasts to 30cm, most 2-15cm. Clast types are similar to above but with an increase in sst + siltstone, and much less grey chert. Matrix is gritty but more clay-rich than above. It is goethite iron-mottled.

Basal portion of upper gravel sample - Pit 3

Sample 11-027-008 – basal sample

Total tonnes sampled = 397t
Average thickness = 0.85m

The basal gravel is much finer than units above and has a very clay-rich matrix with green-colouration reflecting proximity to the bedrock. Clasts are mostly 2-5cm, with a few to 10cm, and lithologies include quartzite + chert + mg sst + siltstone + silicified dolomite.

Basal gravel sample - Pit 3

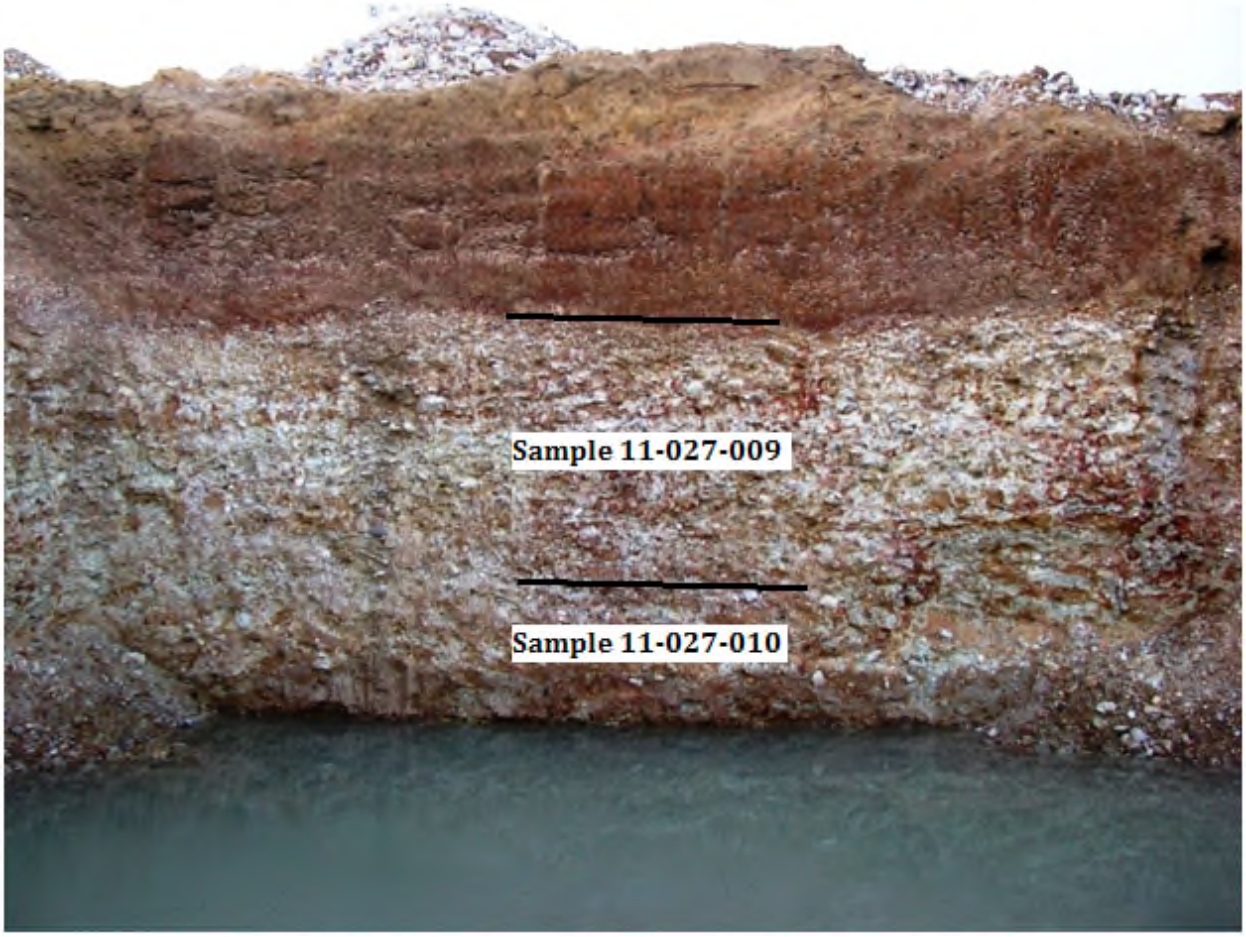
The unit is clast-supported but the matrix has much higher clay content with haematitic Fe mottling. Bedrock contact is undulating with pebbles pushed down into the Proterozoic shale.

Close-up of basal gravel sample - Pit 3

Pit 4

Centroid - 640724E 8214059N

Pit reached 3.8 in depth, with a total gravel thickness of about 2.2m
Overburden thickness varied from 1.5 to 1.8m, and comprised 0.5m m-cs quartz YeOr clayey sand with minor small cobbles overlying lateritised clayey sand with an undulating diffuse basal contact.



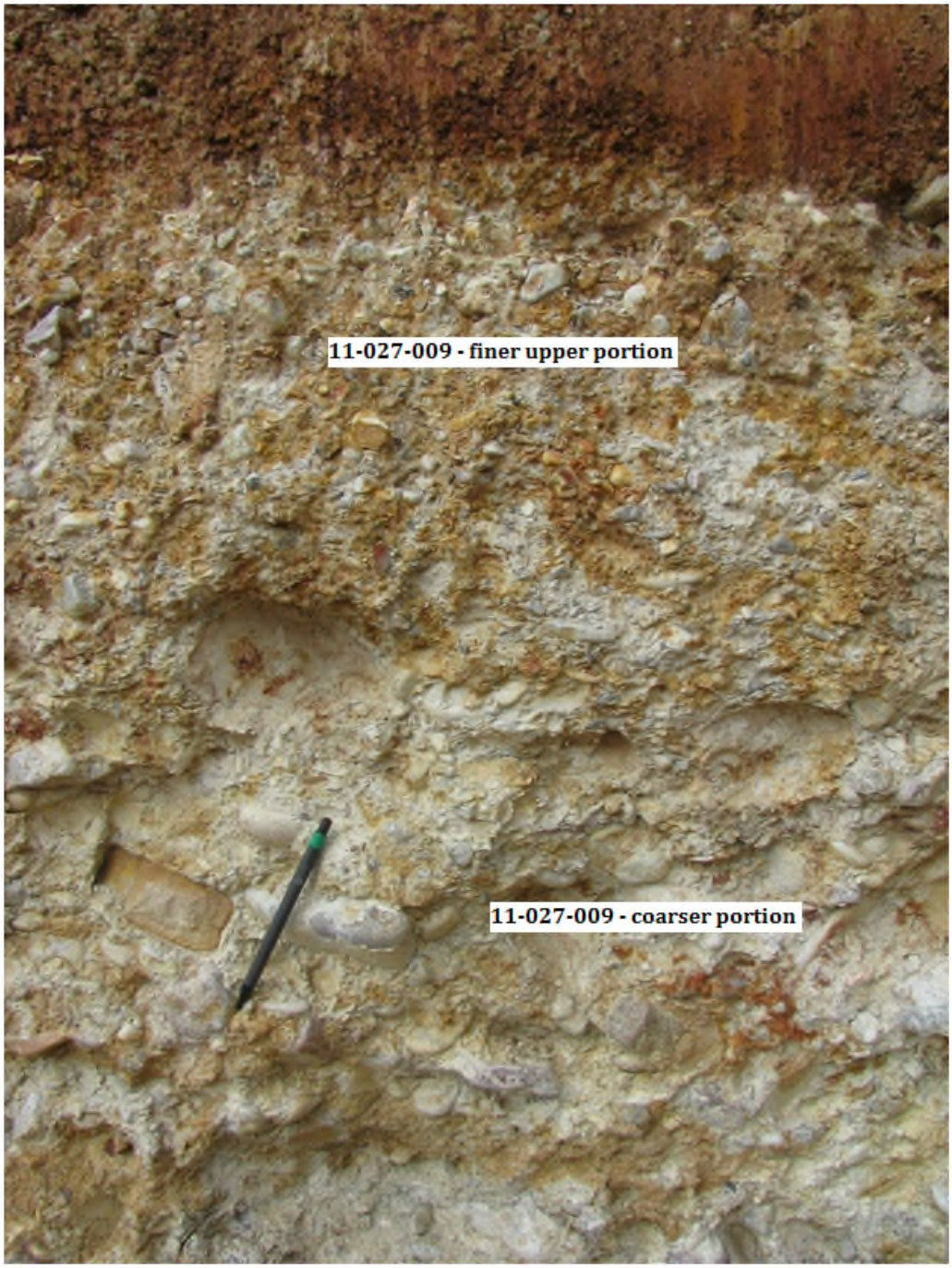
Profile down Pit 4

Two samples were taken down the profile.

Sample 11-027-009– upper sample

Total tonnes sampled = 598t
Average thickness = 1.05m

The sample comprised two discrete gravel horizons. The upper portion is matrix-supported fine pebbly gravel with clasts to 5cm, most 1-3cm, with sandy gritty matrix. Clasts are mostly goethite Fe-stained fg sst + qtz/chert pebbles + med-grained quartzite. Underlying this is much coarser clast-supported gravel with clasts to 40cm, most 2-12cm. Lithologies include mg sst + fg sst +Pk quartzite + silicified dolomite. Clasts are mostly subrounded to rounded. Matrix is clayey gritty sand and the unit has hematite Fe-staining mottles.



Upper gravel sample - Pit 4

Sample 11-027-010– basal sample

Total tonnes sampled = 610t
Average thickness = 1.1m

This sample also comprised two gravel horizons although the contact between the two is more diffuse. The upper portion is finer than the basal gravel with clasts to 15cm, most 2-8cm. Unit is clast-supported with a white clay-rich sandy matrix. Clasts types include Gy chert + flat fg sst + rounded mg sst + jasper.

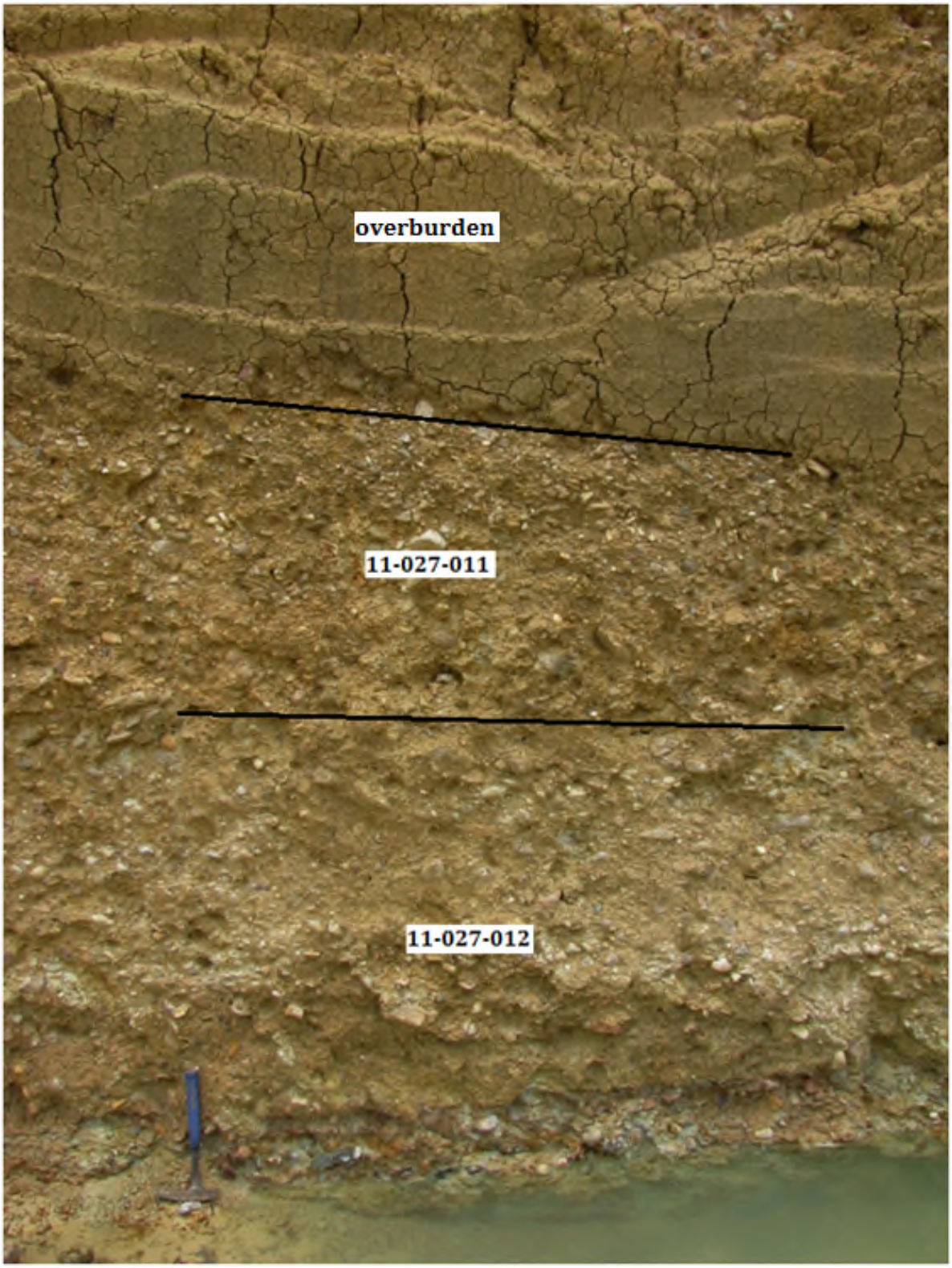
Basal gravel sample with Proterozoic Shale clasts – Pit 4

The lower portion onto the bedrock is coarser and contains sub-angular clasts of the bedrock mudstone/shale up to 30cm in length. Other clast types include PkGy quartzite to 20cm, well-rounded f-mg sst + Gy chert + minor silicified dolomite. This is the only gravel profile in the five bulk sample pits that included clasts of the Proterozoic Shale.

Pit 5

Centroid - 641506E 8214914N

Pit reached 3.0m in depth, with a total gravel thickness of about 1.5m
Overburden thickness varied from 1.5 to 2.0m, and comprised YeBn m-cs clay-rich sand with minor small transported laterite + minor cobbles and pebbles in discontinuous horizon within upper 0.5m section. This causes the patchy lag cobbles on the surface.



Profile down Pit 5

Two samples were taken down the profile.

Sample 11-027-011 – upper sample

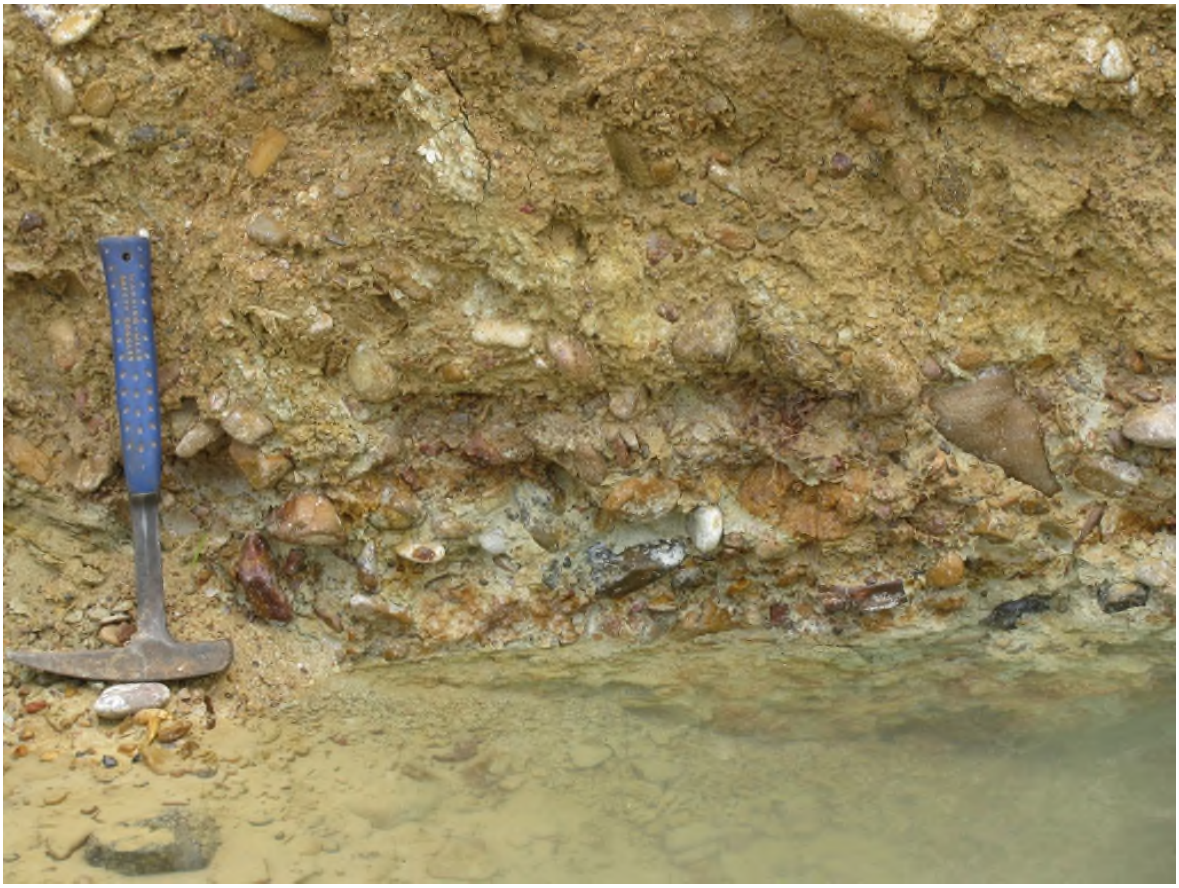
Total tonnes sampled = 445t
Average thickness = 0.5m

Upper gravel sample - Pit 5

The upper gravel in this pit is extensively reworked and has no lateritisation overprint. The gravel is mainly clast-supported, with clasts mostly 2-10cm, some to 20cm. Clasts include Gy chert + flat fg sst + PkGy rounded quartzite + PkOr fg sst + Rd jasper. No transported laterite noted in matrix.

Sample 11-027-012 – basal sample

Total tonnes sampled = 722t
Average thickness = 0.8m



Basal gravel sample - Pit 5

This is a well-structured, more clast-supported gravel with clay-rich gritty matrix. Clasts are mainly 2-5cm, some to 10-15cm. Clast-types are similar to the unit above. Near the southern edge of the pit, the bedrock contact drops down significantly, increasing the thickness of this unit to greater than 1.5m. The cobbles in this portion also appear coarser.