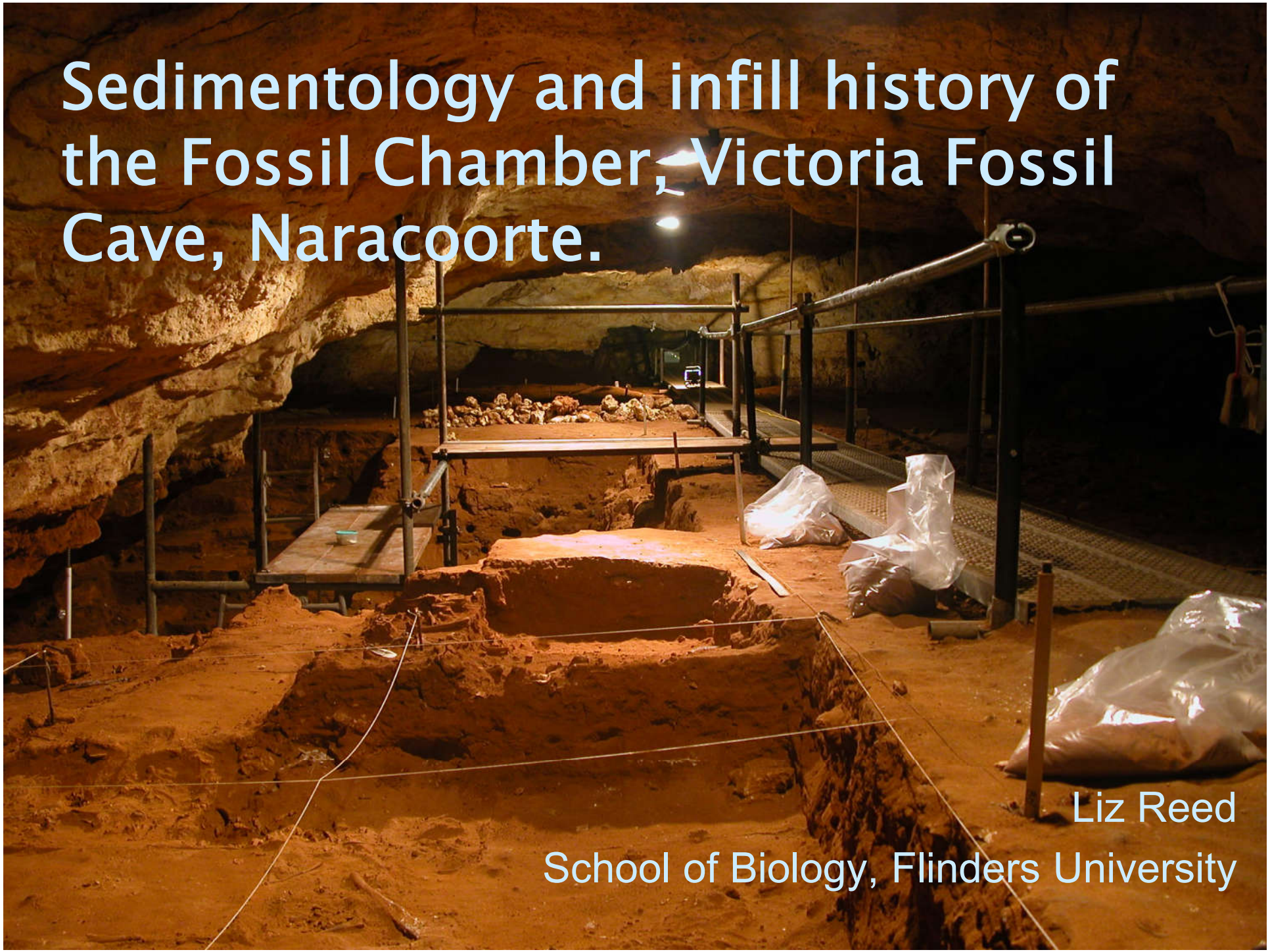
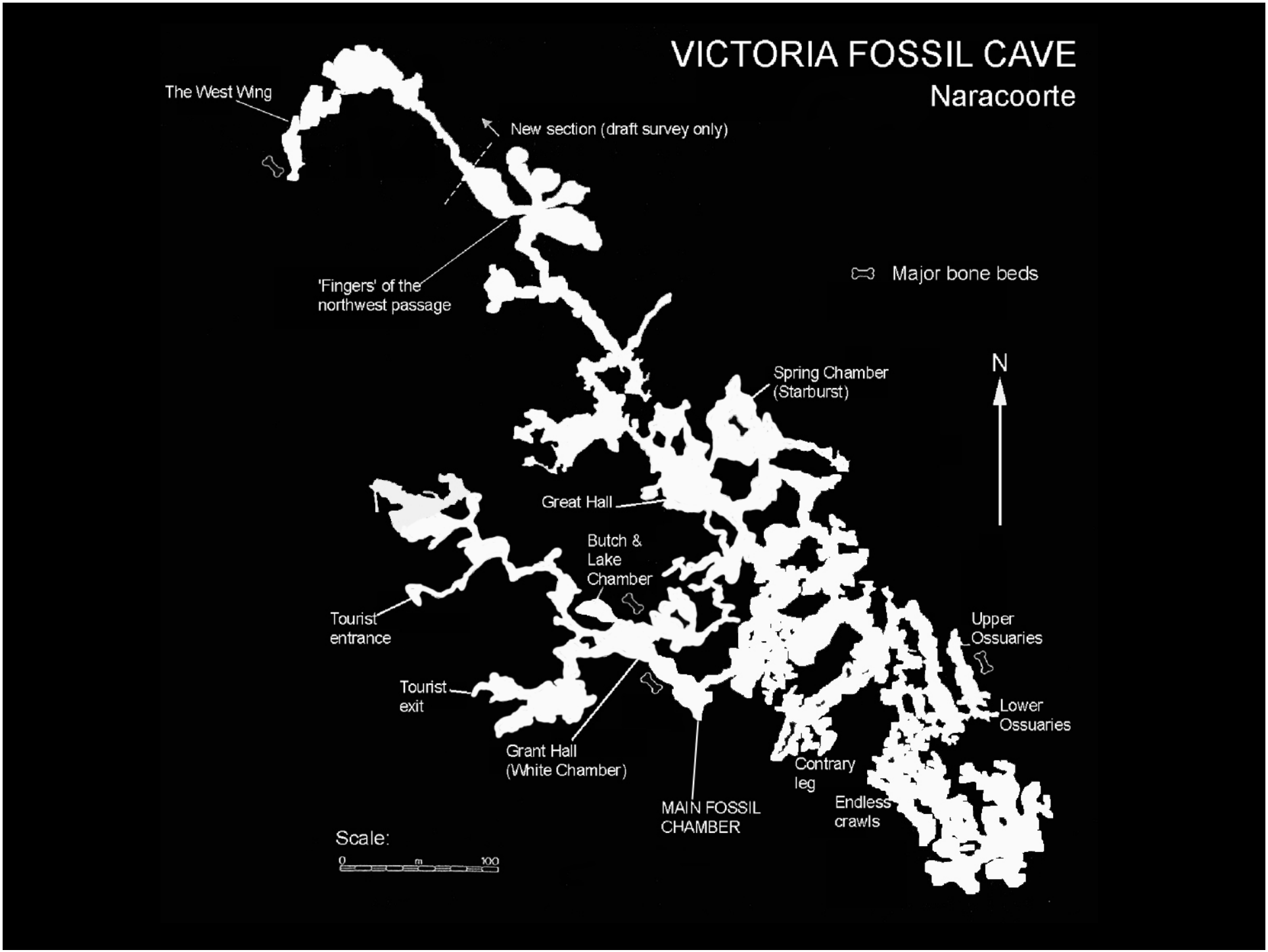
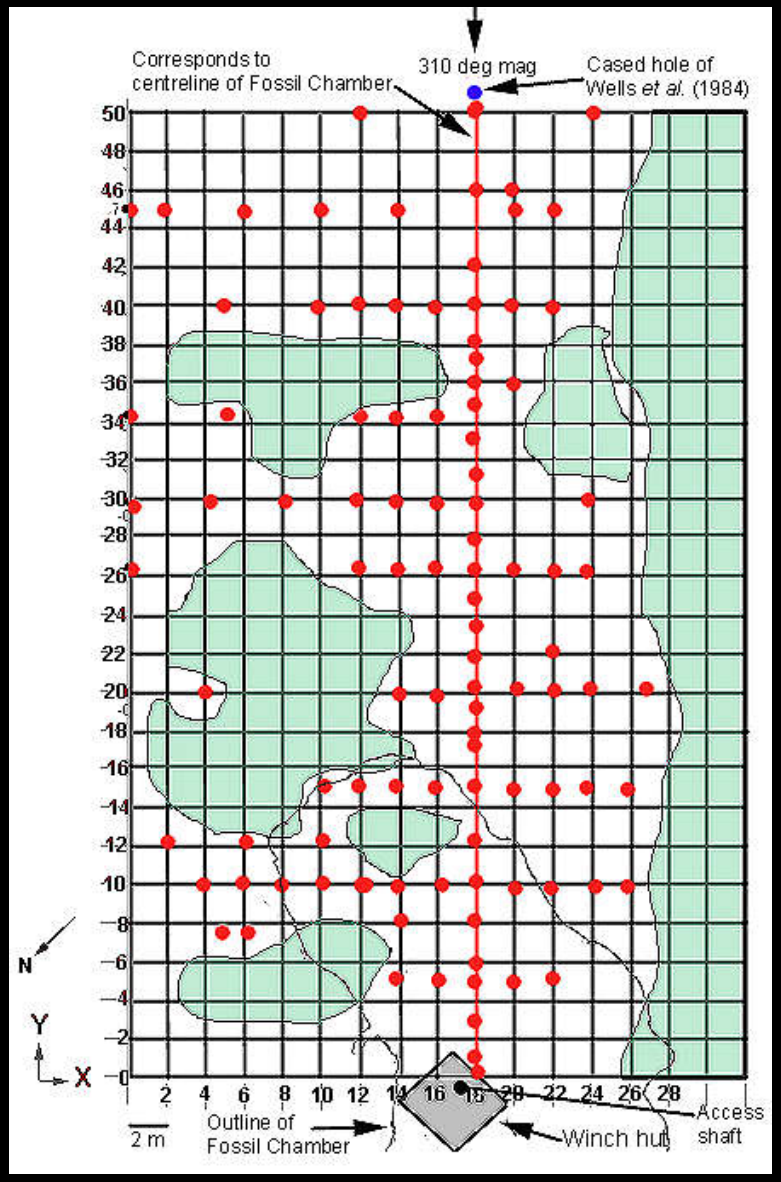
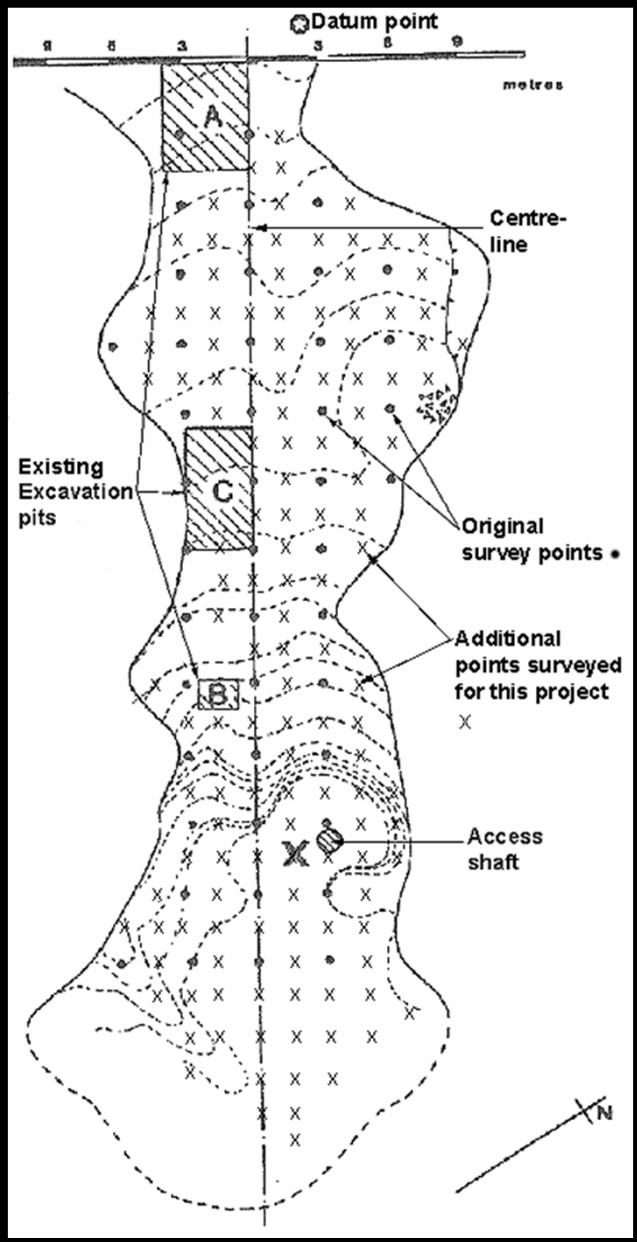

Sedimentology and infill history of the Fossil Chamber, Victoria Fossil Cave, Naracoorte.
Liz Reed
School of Biology, Flinders University


VICTORIA FOSSIL CAVE
Naracoorte
The West Wing
New section (draft survey only)
'Fingers' of the northwest passage
Major bone beds
N
Spring Chamber (Starburst)
Great Hall
Butch & Lake Chamber
Tourist entrance
Tourist exit
Grant Hall (White Chamber)
MAIN FOSSIL CHAMBER
Contrary leg
Endless crawls
Upper Ossuaries
Lower Ossuaries
Scale:
0
m
100

Layout of the grid system used for coring on the land surface above the Fossil Chamber, Victoria Fossil Cave.

Major features are indicated. Green areas indicate vegetation and trees inhibiting coring. Red dots indicate core and probe holes.

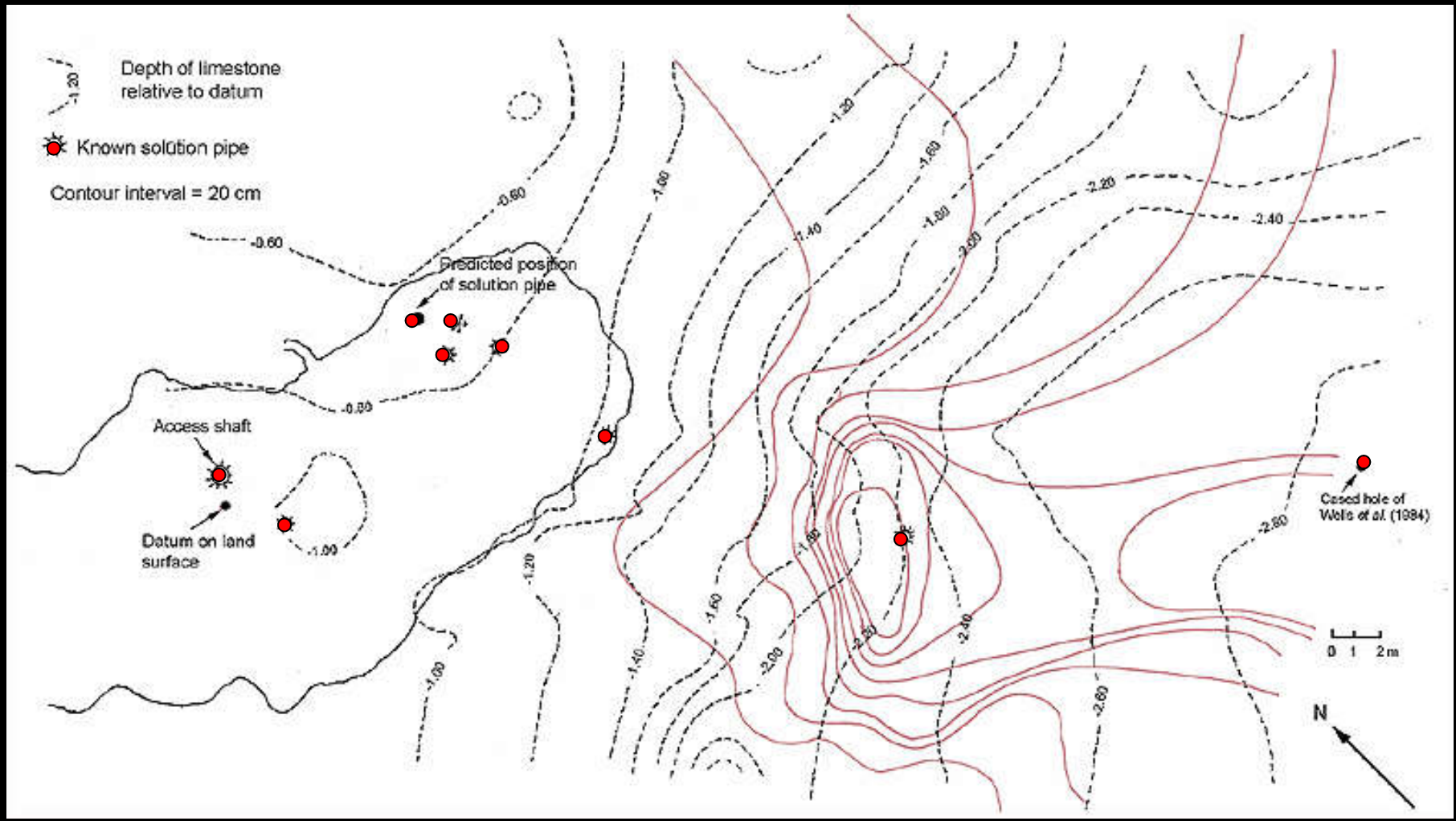


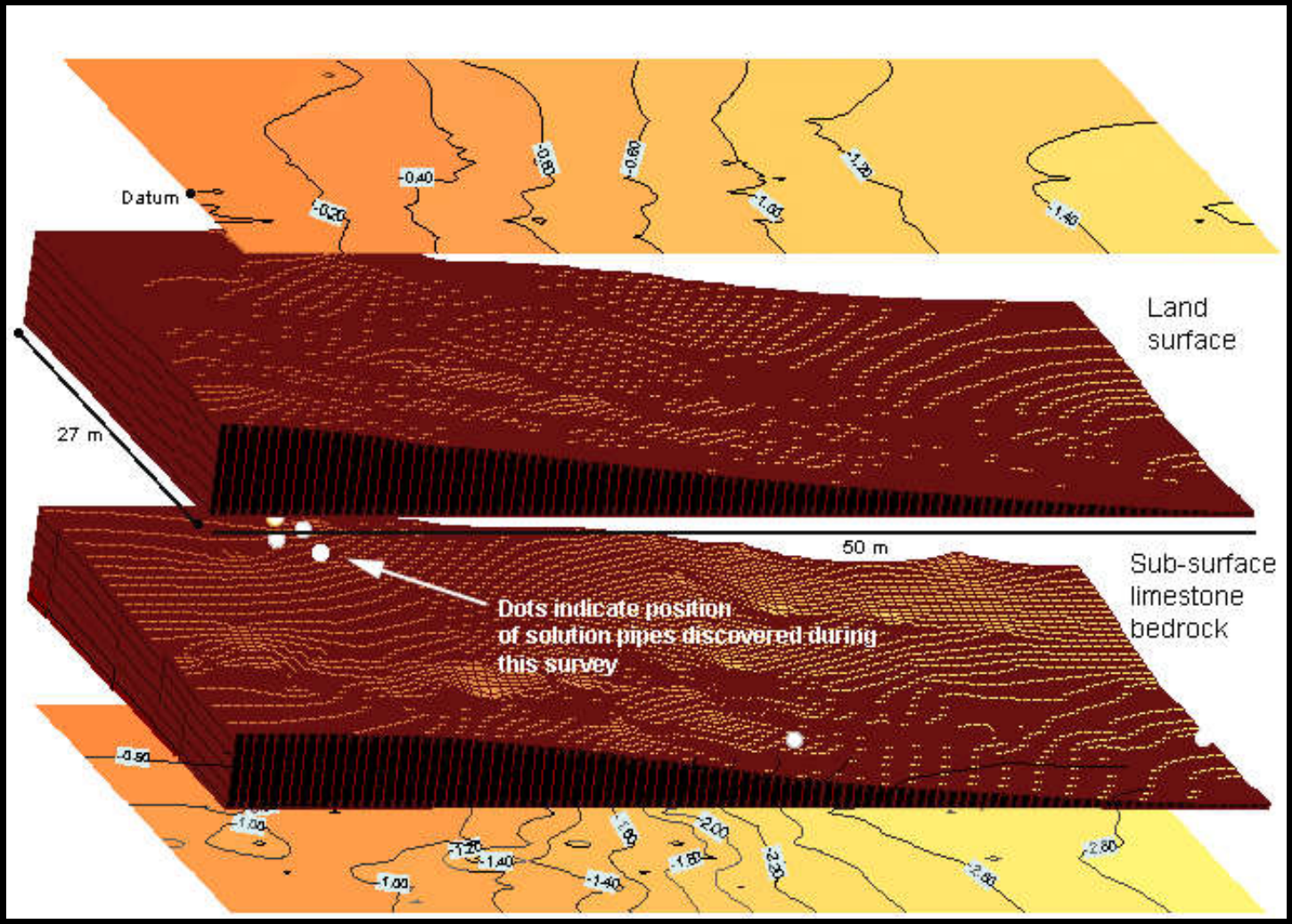


Interior survey of chamber

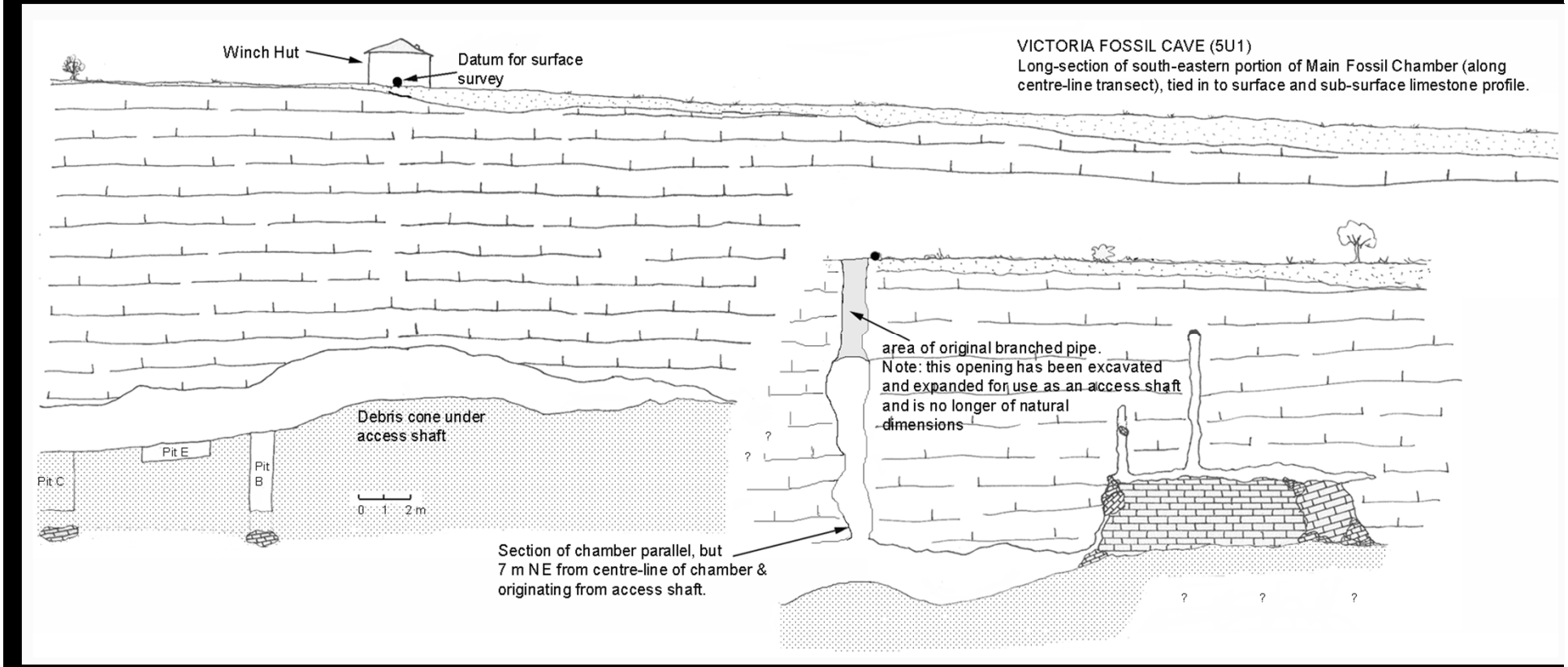
Entry points for sediment and animals

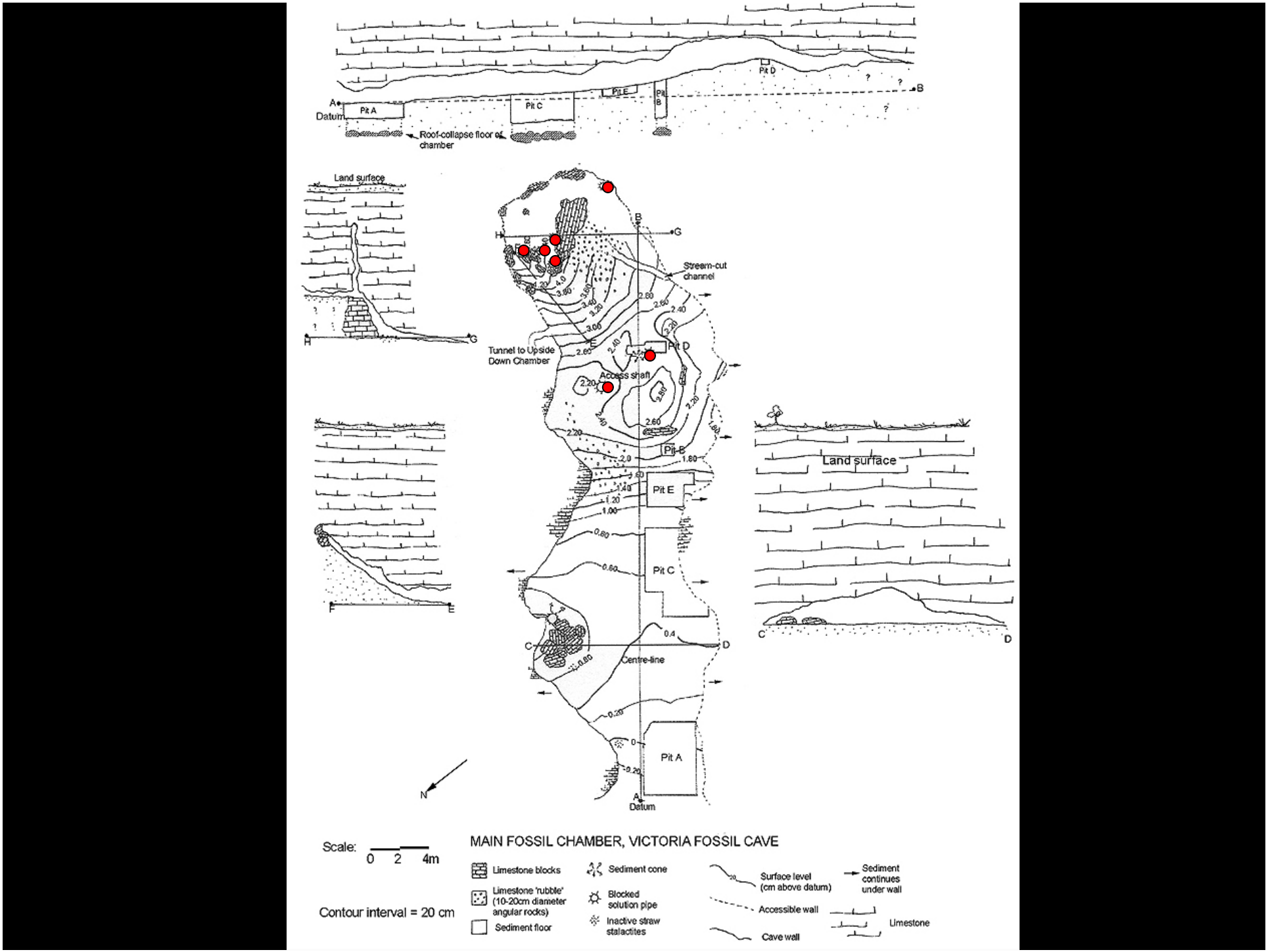
- Old interpretation – “50 m long section of roof collapse with hole 10 m wide & 10 m deep.
- New interpretation – multiple, narrow (<1 m diam.) solution pipe entrances; >10.6 m depth in limestone.





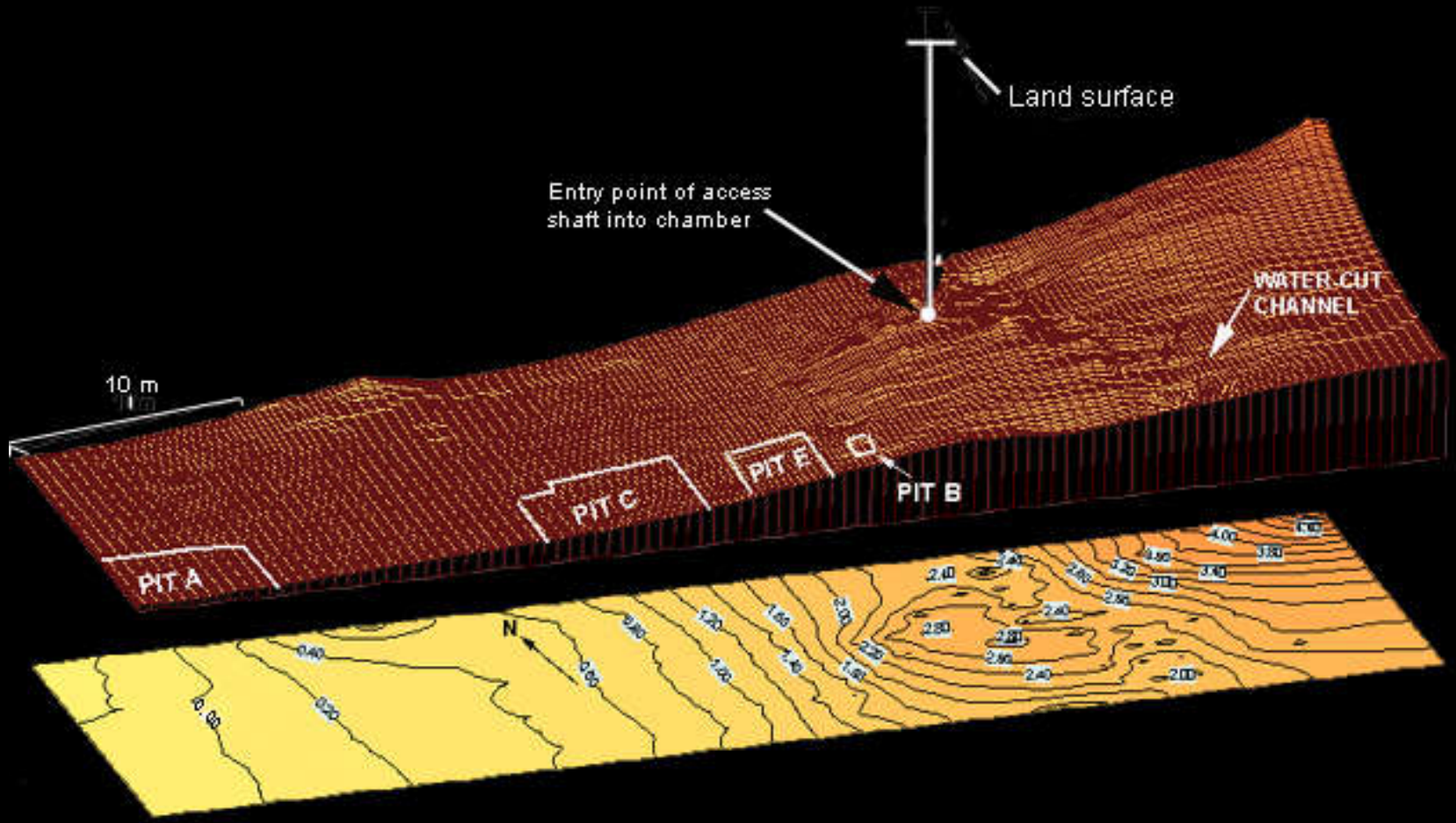
Topographic contour and 3D diagrams for the land surface (above) and sub-surface Limestone (below) corresponding to the area above the south-eastern portion of the Fossil Chamber, Victoria Fossil Cave (5U1).

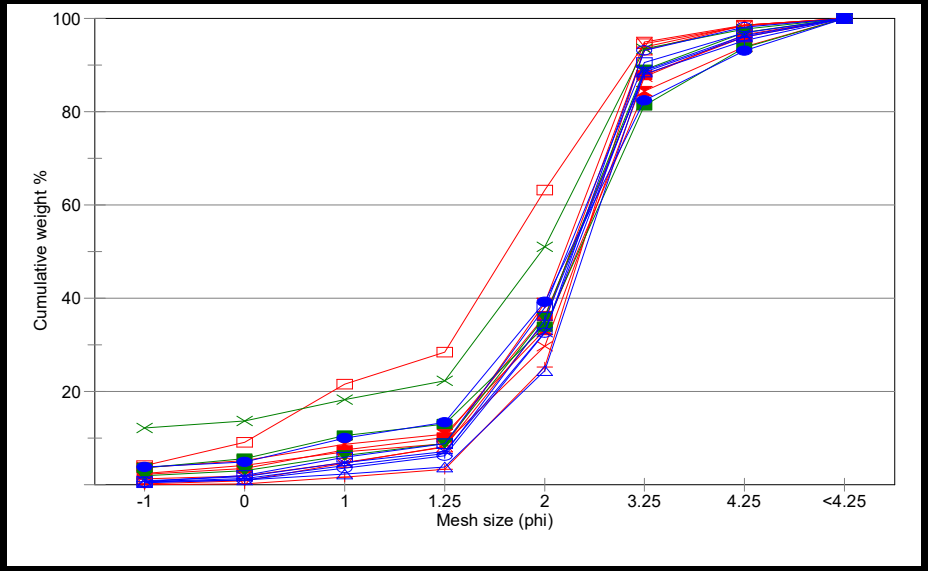

Winch Hut
Datum for surface survey
VICTORIA FOSSIL CAVE (5U1)
Long-section of south-eastern portion of Main Fossil Chamber (along centre-line transect), tied in to surface and sub-surface limestone profile.
area of original branched pipe.
Note: this opening has been excavated and expanded for use as an access shaft and is no longer of natural dimensions
Debris cone under access shaft
Pit E
Pit C
Pit B
0 1 2 m
Section of chamber parallel, but 7 m NE from centre-line of chamber & originating from access shaft.
?
?
? ? ?

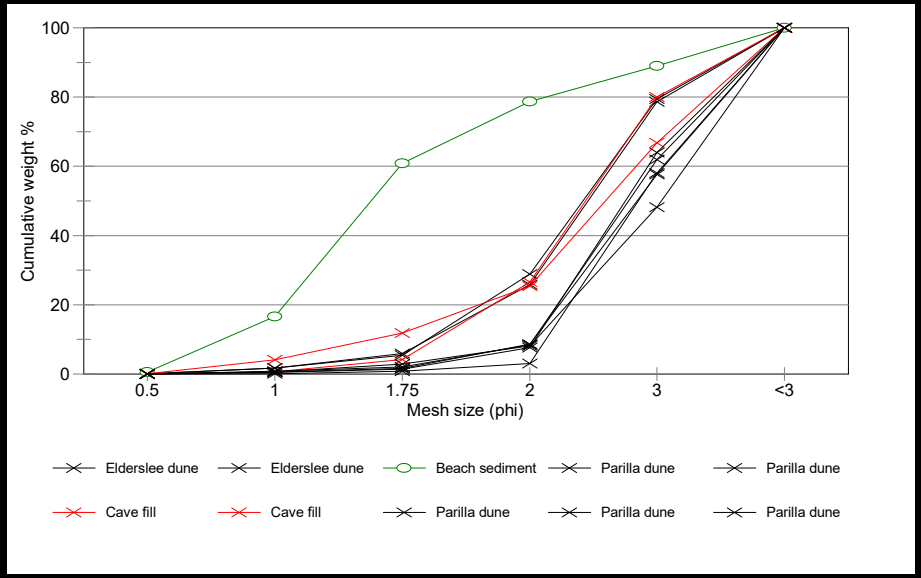

A
Datum
Pit A
Pit C
Pit E
Pit B
Pit D
B
Roof-collapse floor of chamber
Land surface
H
G
Stream-cut channel
Tunnel to Upside Down Chamber
Access shaft
Pit D
Pit B
Pit E
Pit C
Pit A
Land surface
F
E
C
D
Centre-line
N
Datum
Scale:
0 2 4m
Contour interval = 20 cm
MAIN FOSSIL CHAMBER, VICTORIA FOSSIL CAVE
Limestone blocks
Limestone 'rubble' (10-20cm diameter angular rocks)
Sediment floor
Sediment cone
Blocked solution pipe
Inactive straw stalactites
Surface level (cm above datum)
Accessible wall
Cave wall
Sediment continues under wall
Limestone

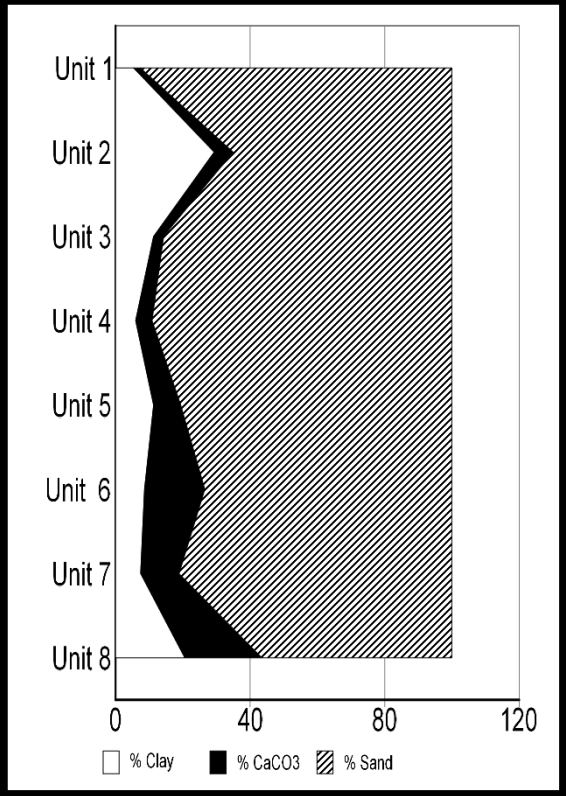
The fossil bed

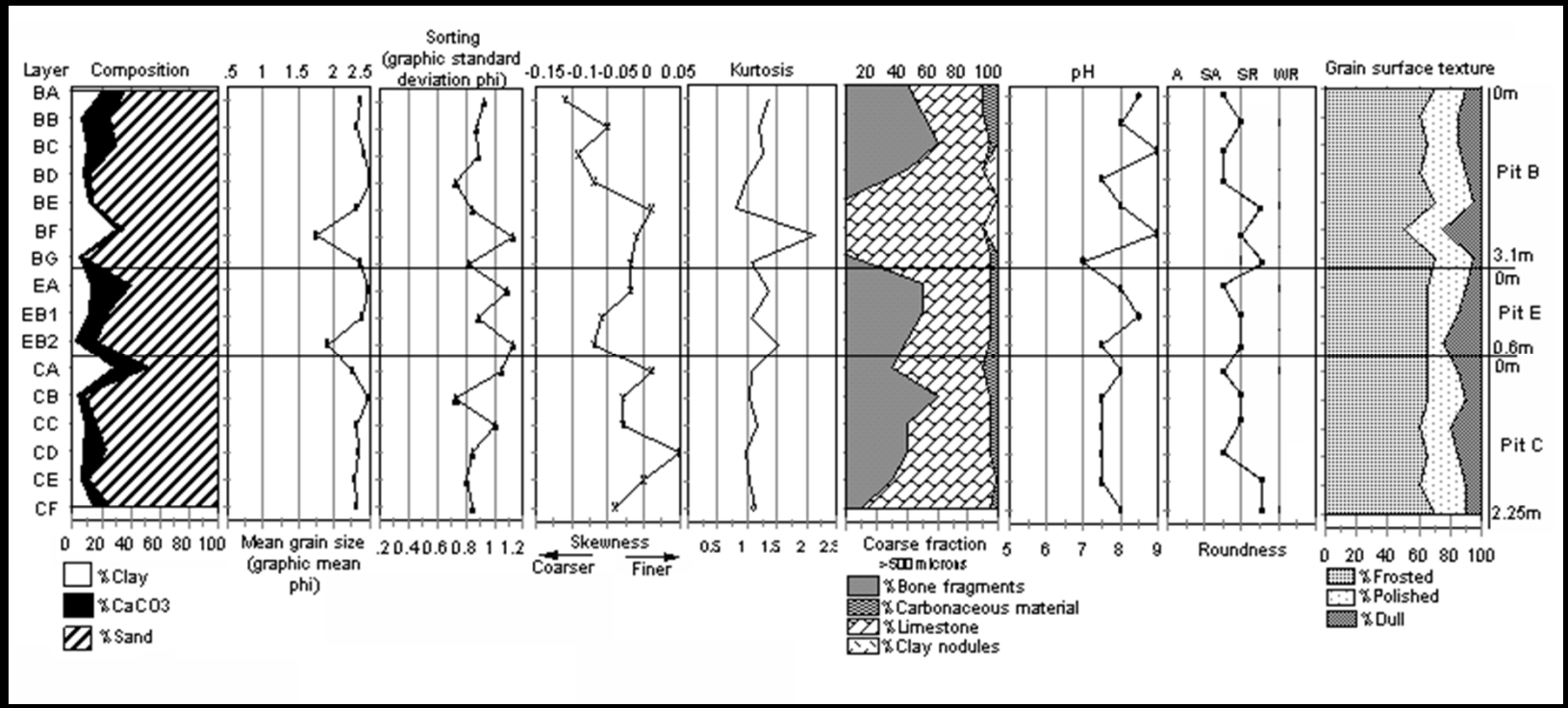
- Known length ~65 m; actual length ??
- Maximum width of accessible portion = 20 m; actual width ??
- Maximum depth of sediment bed = 7 m.

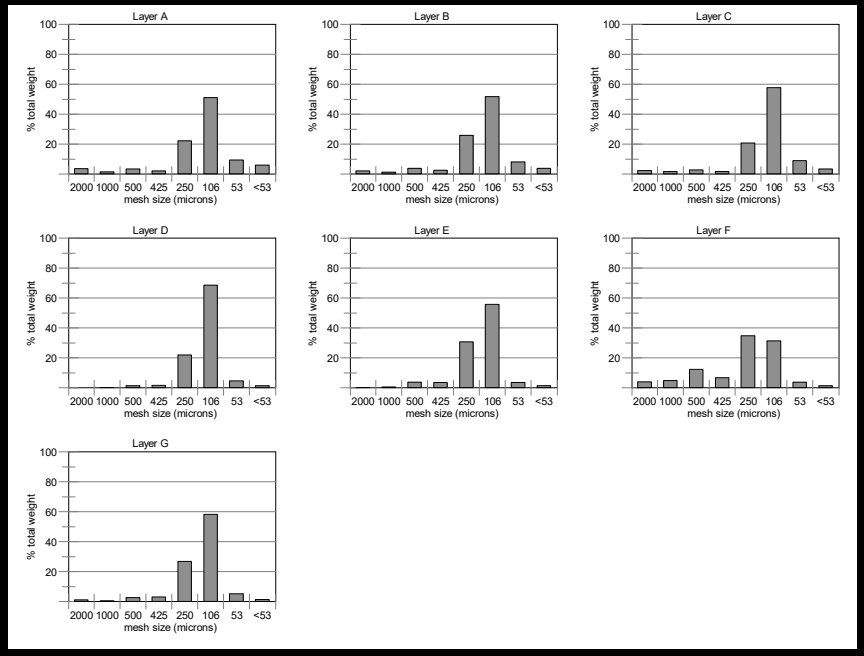


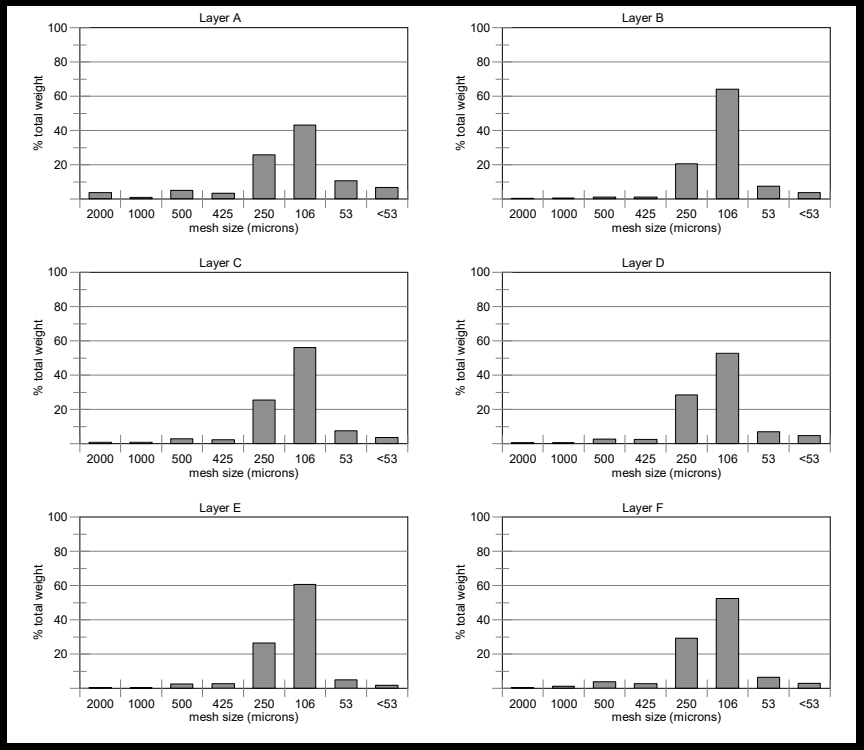

100
80
60
40
20
Cumulative weight %
-1
0
1
1.25
2
3.25
4.25
<4.25
Mesh size (phi)

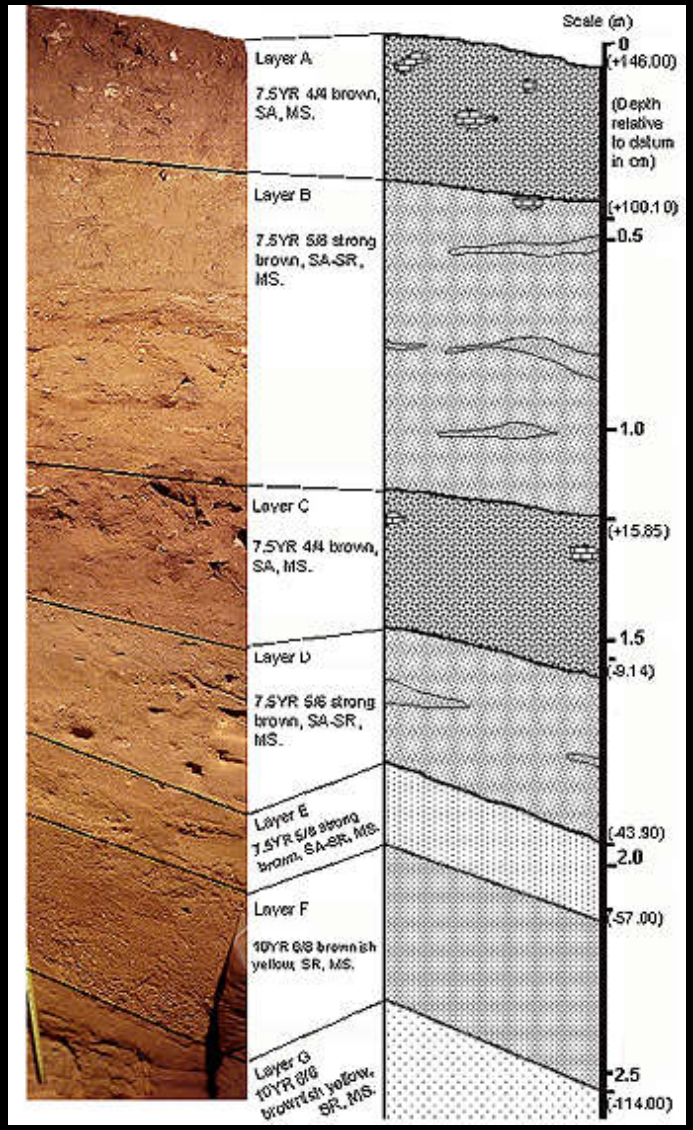

100
80
60
40
20
0
Cumulative weight %
0.5
1
1.75
2
3
<3
Mesh size (phi)
Elderslee dune
Elderslee dune
Beach sediment
Parilla dune
Parilla dune
Cave fill
Cave fill
Parilla dune
Parilla dune
Parilla dune

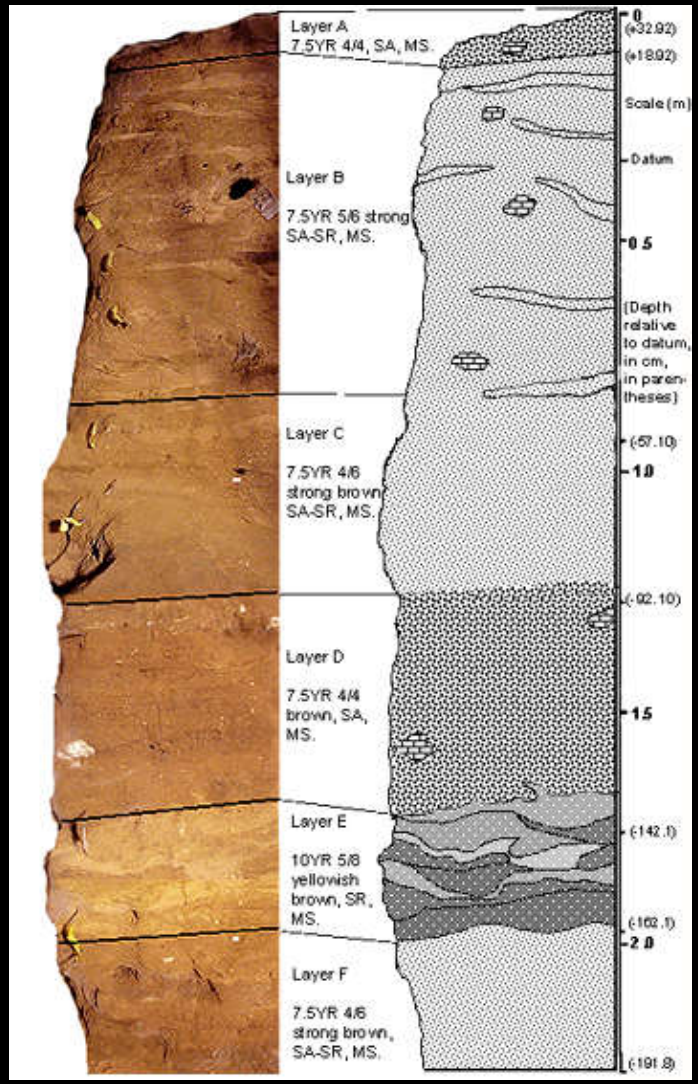

Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
Unit 6
Unit 7
Unit 8
0
40
80
120
% Clay
% CaCO3
% Sand


Layer
Composition
Sorting (graphic standard deviation phi)
Kurtosis
pH
Grain surface texture
BA
BB
BC
BD
BE
BF
BG
EA
EB1
EB2
CA
CB
CC
CD
CE
CF
0m
Pit B
3.1m
0m
Pit E
0.6m
0m
Pit C
2.25m
0 20 40 60 80 100
%Clay
%CaCO3
%Sand
Mean grain size (graphic mean phi)
Skewness
Coarser
Finer
Coarse fraction
%Bone fragments
%Carbonaceous material
%Limestone
%Clay nodules
A SA SR WR
Roundness
%Frosted
%Polished
%Dull


Layer A
Layer B
Layer C
Layer D
Layer E
Layer F
Layer G
% total weight
100
80
60
40
20
2000 1000 500 425 250 106 53 <53
mesh size (microns)

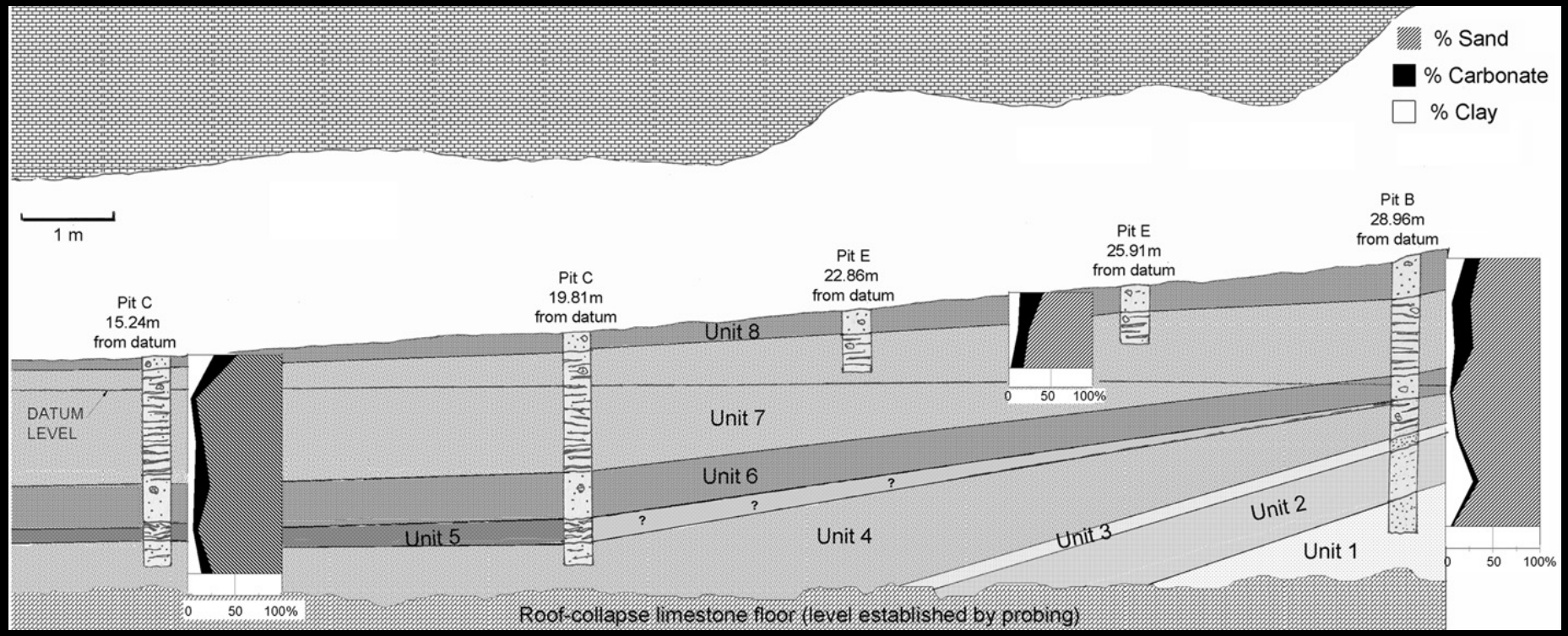

Layer A
Layer B
Layer C
Layer D
Layer E
Layer F
% total weight
100
80
60
40
20
2000 1000 500 425 250 106 53 <53
mesh size (microns)


Scale (m)
0
(+146.00)
(Depth relative to datum in cm)
Layer A
7.5YR 4/4 brown, SA, MS.
Layer B
7.5YR 5/8 strong brown, SA-SR, MS.
(+100.10)
0.5
1.0
Layer C
7.5YR 4/4 brown, SA, MS.
(+15.85)
1.5
Layer D
7.5YR 5/6 strong brown, SA-SR, MS.
(-9.14)
Layer E
7.5YR 5/8 strong brown, SA-SR, MS.
(-43.90)
2.0
Layer F
10YR 6/8 brownish yellow, SR, MS.
(-57.00)
Layer G
10YR 6/6 brownish yellow, SR, MS.
2.5
(-114.00)

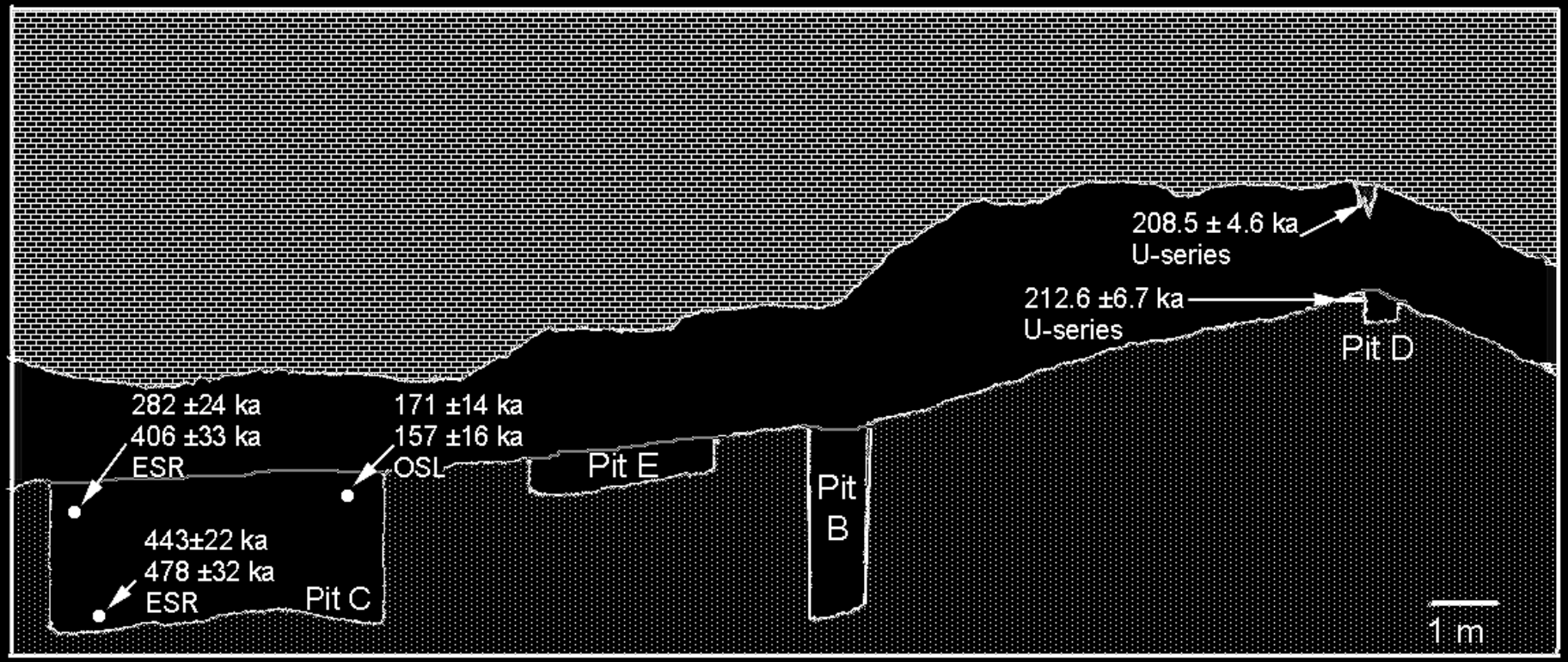

Layer A
7.5YR 4/4, SA, MS.
0
(+32.92)
(+18.92)
Scale (m)
Datum
Layer B
7.5YR 5/6 strong SA-SR, MS.
0.5
(Depth relative to datum, in cm, in parentheses)
Layer C
7.5YR 4/6 strong brown SA-SR, MS.
(-57.10)
1.0
(-92.10)
Layer D
7.5YR 4/4 brown, SA, MS.
1.5
Layer E
10YR 5/8 yellowish brown, SR, MS.
(-142.1)
(-162.1)
2.0
Layer F
7.5YR 4/6 strong brown, SA-SR, MS.
(-191.8)

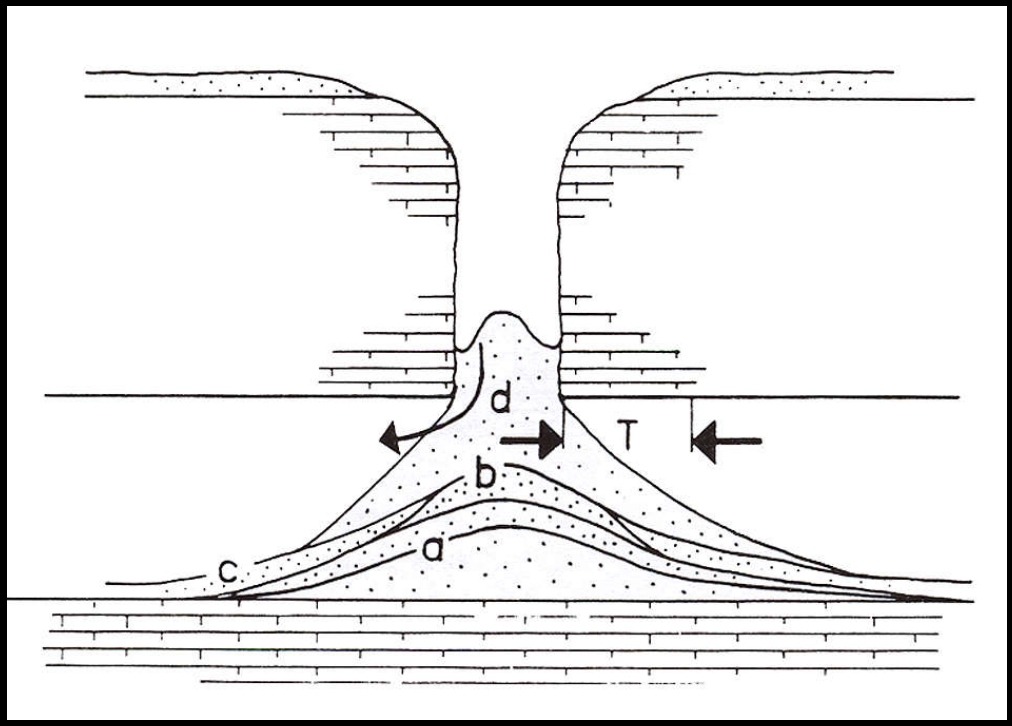
Sediments & stratigraphy

- Fine to very fine sand; poorly to moderately well sorted; rounded to sub-rounded grains; uniform grain size distribution.
- Composition = mostly sand (generally >80%) with varying quantities of clay, carbonate and other coarse particles (e.g. bone fragments, charcoal).
- Source – Pleistocene dune facies of the Bridgewater formation.
- 8 stratigraphic units representing depositional episodes.
- Low energy deposition; some evidence of ‘micro-channelling’ by water down the cone.



Age of the deposit





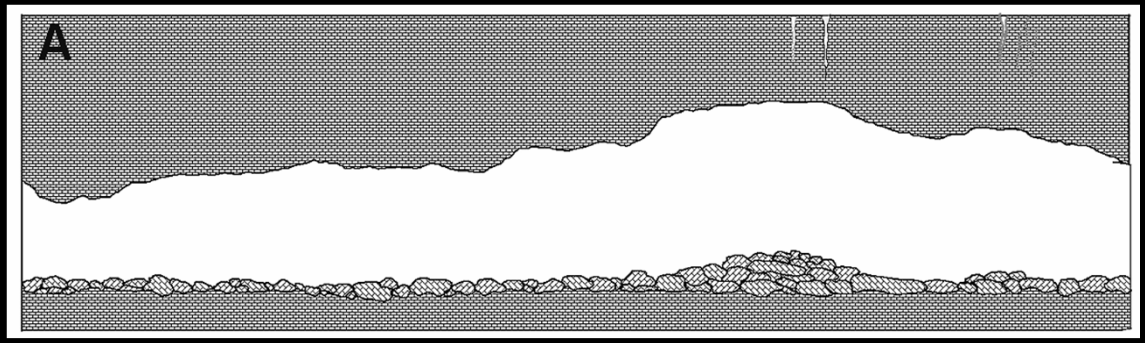
Model of sediment infill for Fossil Chamber (after Wells *et al.* 1984).

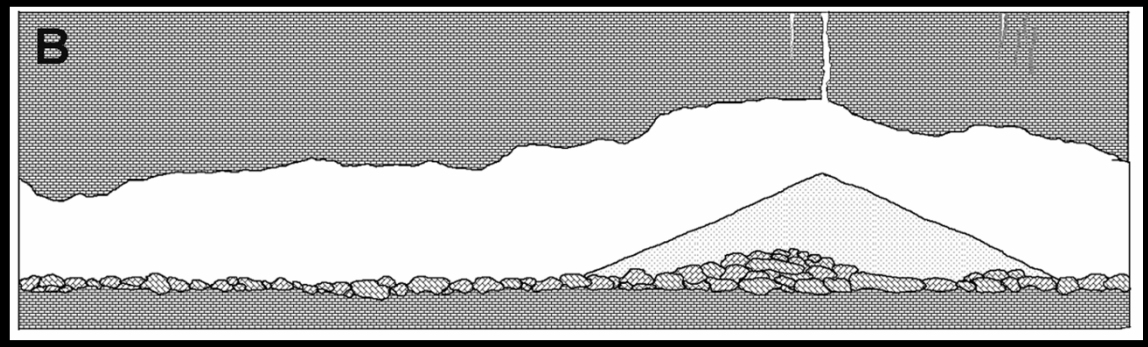
- Sediments accumulate as a cone beneath the entrance and with subsequent water influx are carried down the cone to be deposited as an alluvial fan (a);

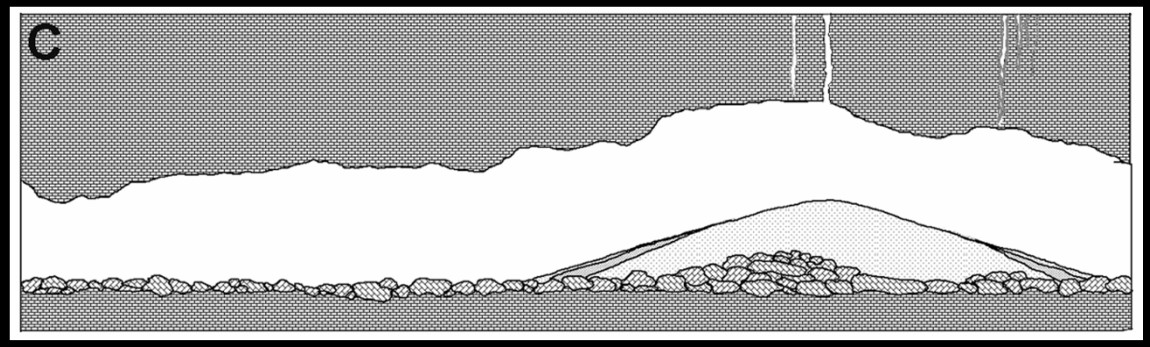
- with high rates of water flow erosion takes place with subsequent deposition on the distal portions of the fan (b & c);

- mass movement may occur following blocking of the entrance by sediment (d) and ponding in the doline, with slumping occurring in the “transition zone” (T) and further movement of sediment along the cone and fan.

Infill model




B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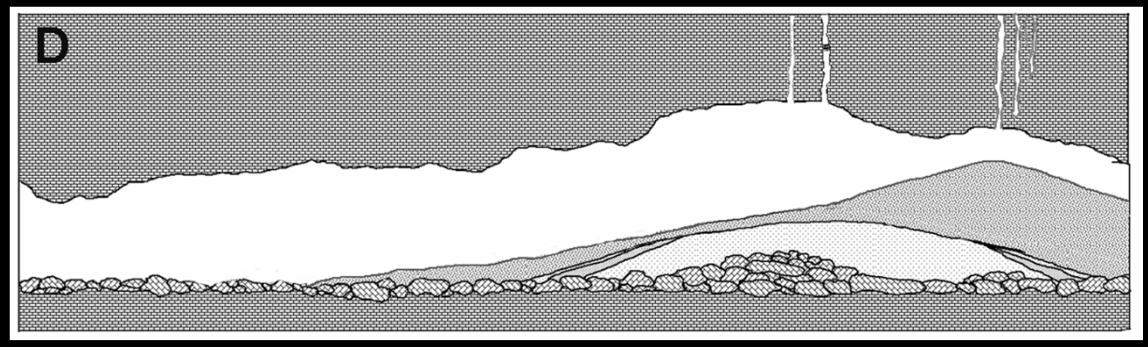
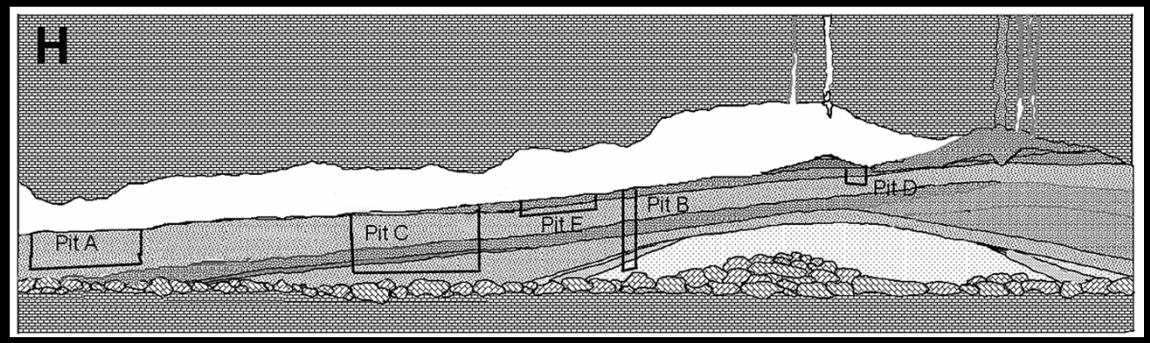

D


F


G


H
Pit A
Pit C
Pit E
Pit B
Pit D