

SUSS BULL 53 (3)

OCTOBER – DECEMBER 2014



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Cover Photo: Aragonite Snowfields, Mammoth Cave, Jenolan.
Paul Lewis

In this edition

The Mammoth Mapping project led by Phil Maynard moves east with this edition containing details of Naked Lady Chamber and the restricted area, World Of Mud (one of the more beautiful areas of Mammoth). Most other material received has been deferred for the next Bull, expected in May.

They said what?

“37 thousand kilometres? That’s miles away!”

“That is a good way to kill two stones with one bird!”

“Do I climb up this head first?”

In the News

A story about Cliefden from The Central West Daily.

<http://www.centralwesterndaily.com.au/story/2911857/earth-first-saving-cliefden-caves-a-wise-political-move/?cs=105>

Life might thrive a dozen miles beneath Earth’s surface.

<http://phys.org/news/2015-01-life-dozen-miles-beneath-earth.html>

If you get a tick while walking to or from the caves here is a story on suggestions for removal.

<http://www.abc.net.au/catalyst/stories/4177191.htm>

Project Progress

Jenolan dive survey

Recent mild flooding at Jenolan created poor visibility for divers that hindered survey project work. Despite these set-backs, the divers hope to complete their survey of Ice Pick Lake in the next 1-2 trips.

Cliefden Mapping

Phil has led the SUSS mapping project to Cliefden running several trips over Spring and Summer.

Cooleman

SUSS at Cooleman this January found a significant new river entering the downstream section of River Cave. One hundred meters of surveyed passage ended in a number of long duck-under, ultimately ending in a cave dive. Unlike the main drain the new river is crystal clear. At its final drop into the depths, dive lights penetrated a straight spacious tunnel with no apparent end.

Jenolan

When J75 was visited this summer an extension was discovered.

Hennings resurvey

This is now at 479m and still going.

Hints

The use of GoPro like devices are on the rise. The editor loves to get pictures, but extracting a photo from a GoPro movie needs planning in order to provide a good still photo. When a GoPro is filming a movie, the frames are designed to be smeared so that movement to appear smooth. If you are using a GoPro and are considering taking a still shot for a photo, pause for a couple of seconds, with your helmet mounted camera aimed at your subject.

Otherwise the blurred image you send for publication will only be able to be reproduced as a small image in the Bull (Thanks to Rod Obrien for this suggestion).

A note on spelling names

Your beloved editor does not attend all SUSS trips and is often completely unaware of the people mentioned in trip reports, let alone how to spell their names. Could those who write up the trip reports please ensure that you spell names correctly. Likewise those who produce maps for the Bull (please note the editor has no ability to correct spelling in submitted maps). The editor has received multiple concerns from people who’s name has been misspelt in maps and articles and she would appreciate the time taken by contributors to ensure participants names are spelled correctly. Thank you in advance for this.

JENOLAN DEC WEEKLONG

BY ROD OBRIEN, ROWENA LARKINS, PHIL MAYNARD, KEIR VAUGHAN-TAYLOR

Participants: Tabitha Blair, Denis Stojanovic, Steven Kennedy, Rod Obrien, Deborah Johnston, Rowena Larkins, Greg Ryan, Adam Hooper, Ian Cooper, Thomas Cunningham, Thomas Wilson, Felix Ossig-Bonanno, Maddison Logan, Jack Wachsmann. Max Midlan, Tina Willmore, Anna Ossig-Bonanno, Jordan

Saturday 6th Dec, CORONET CAVE

Participants: Rowena Larkins, Tina Willmore, Steve Kennedy and Rod Obrien

(Author Rod)

A lovely sunny day greeted us as we made our way down to the southern limestone. Rowena had found a hole on a previous hill wandering trip that looked like it would connect into Coronet Cave.

Coronet is a nice little cave but due to its preservation only four cavers each year are permitted entry. There is some nice formation especially in the back sections and some sporty caving in ascending the ladder climb that has a nice squeeze halfway up. The middle section of the cave at the bottom of the ladder pitch has a lovely mud bog you need to navigate. On this trip the cave was very dry but your boots and body still stuck to it like flypaper.

After reaching the cave we descended to the first main chamber. Steve crawled into a low flattener while Rowena at the new hole on the outside shone her headlamp into it. The light could be seen and a connection was made. Rowena surveyed it.

We all regrouped in the main chamber where Rowena checked some leads on the cave survey. Tina was busy taking photos for the book. Rod and Steve rigged the ladder pitch and we all moved to the back of the cave being careful that nobody left any boots behind in the mud. Rowena continued her survey updating while Tina was taking some great photos.

It appeared that since Rowena's previous trip the cave had flooded. Some of the decorations on the floor had been washed away and mud had been deposited a good metre up the wall. The small lake at the back was gone leaving some nice passage under the floor. We assume the plug holding up the lake had let go with the increased flood water pressure.

The highlight on the way out was sitting at the top of the ladder pitch watching everyone struggling up the ladder through the squeeze. That kind of entertainment never gets old.

Sunday 7th December, MAMMOTH CAVE

Participants: Tina Willmore, Jordan, Steven Kennedy, Rod Obrien and Rowena Larkins

(Author Rod)

Another lovely sunny day greeted us. This was Jordan's first trip into Mammoth so we did a nice site seeing tour for her. Rowena guided us around Horseshoe Cavern to Hole in the Wall where she left us to tidy up some work in the Southern Limestone.

After sliding down Hole in the Wall I was left with a feeling that because of my size I would never get back up it. Thank god we were coming back up Debouchment. On we pressed at a steady pace helping Jordan up some of the more awkward climbs. We had a small break at Central River then carried on to the Dam and old 1961 campsite. When reaching the Dry Siphon we stopped for lunch. There being some water in the Siphon Tina and Jordan had a break while Steve and I slithered through and carried on. Steve was keen to show me the Liquidator. Mark Staraj had taken him there to survey it years before. Past the Junction at the base of a muddy slope that takes you to North Tunnel is a passage eventually connecting to Central River. The Liquidator is on a bend at floor level. It is a small vertical passage descending to the river filled with Steve's horror stories. I stuck my head in, which was nearly all that would fit and then politely declined Steve's invitation to jump in and have a look. We slowly made our way back out. Me trying to navigate for a while but after some wrong turns I was replaced. In my defence I was not the only person to veer off course that day. We headed back under Sugar Cubes, Davey Jones Locker and then climbed Debouchment. Jordan needed a lot of help here as she was afraid of heights.

Everything was going well until we reached the jug handle when some mud landed in Jordan's eye. After clearing some mud out, several eye cleaning methods were tossed around including removing the eyeball. Tina's trusty first aid kit to the rescue and some eye wash saved the day. My first trip to this part of the cave and everyone had a great day.

Mon 8th Dec

Participants: Steven Kennedy, David-Stephen Myles and Rowena Larkins

(Author Rowena)

It was Monday and many of the weekend crowd had headed home. David arrived, closely followed by Stephen Kennedy wandering up. We headed off to check out a couple of caves on Lucas Rocks. We walked past J150 and I showed them where I sheltered from sleet last summer in December (giving the cave a name).

Our goal was to check out Knitting Needle cave and confirm the survey. We wandered over the saddle of Lucas Rocks and down the east side cliff edge, where we found the tight entrance and squeezed through. We took some photos of the helictites and confirmed that we needed someone smaller to progress the squeeze lead at the west side of the cave.

We left the cave and Rowena showed the others where the entrance to Bifröst was. While there we startled a rock wallaby which bounded up a vertical wall while we watched in amazement.

After lunch Rowena and David went up the Southern Valley and while poking around near Bottomless Pit Valley found a cave with 2m of passage. This is worth further examination in the future.

Dec Wed 10

Participants: Phil Maynard, David-Stephen Myles

(Author Phil)

Phil and David went to North Tunnel, to continue northward with the survey. We found the cave was dryer and warmer than usual, except for Waterfall passage and Dry Syphon of course. By the time we arrived in North Tunnel, we were more than ready for a water stop.

The survey had previously reached Half Moon passage, so we were starting in the midst of the tight stuff. It took quite a few legs to get in to Sinkhole Cavern, where the Disto X measured a roof height of 18 metres! Eventually, we slid through Formation Squeeze and reached the entrance of GNC. The stats:

45 legs

87 metres

542 bruises (this may or may not be accurate)

Next up will be Great North Cavern and Cycloidal Passage. When I can find some small people, we can survey Nudist Colonies.

Thursday 11 Dec, Council Creek

Participants: Phil Maynard, Rod Obrien, Keir Vaughan-Taylor

(Author Keir)

Many years previously Ian Cooper reported finding a significant resurgence in Council Creek off the Kanagara Road. The Jenolan limestone disappears South under a mountain range at Paradox Cave but emerges again in places along the Hollanders River. Would it be great to find a cave that went in at the Hollanders and came out at Paradox!

Phil, Rod and Keir sought to re find this resurgence, hiking down Council Creek to the Hollanders River. There is potential for caves noting that not that far away is the spectacular Tuglow Cave.

There is no limestone in Council Creek and is mostly dairy farm. Walking is easy all the way to the Hollander which by contrast has many limestone outcrops along its course. There are a number of cave features but you know how farmers are with holes for their cows to fall in. Nevertheless more trips are required to get a better idea of the caving potential in area.

A substantial navigation error brought the group to the summit of Mount Budthingaroo. An inviting ridge headed totally the wrong way adding many kilometres to the total walk.

Afterwards Ian Cooper returned from the remote wilds of Australia's remote mining camps to report he actually has GPS co-ordinates of the mystery resurgence.

Sat 13th Dec

Fat Jacks

Participants: Chris Norton, Stephen Kennedy, Rowena Larkins, Rod Obrien, Tabitha Blair

(Author Rowena)

Some photography was needed and also a check of the map survey that was done some time ago. With nice bright Scurion headlamps it was awesome to look up the 20m to the ceiling, with the long shawls draping almost the full length of the walls. The source of stalactites fallen from the ceiling could be determined; these would not have been damaged by humans but would have fallen naturally.



Denis expounds his wisdom to some students at the Christmas Party

Several SUSS members had headed off to do Kanangra main on Saturday and returned in time for the caving event of the year, the SUSS Christmas party.

In the evening we partied hard and long. It was pleasing to see many students attending.

Sun 14th Dec

Wiburds

Participants: Rowena Larkins, Steven Kennedy, Rod Obrien, Tamarra Potter, Larissa Potter, Rhiannon Bateman

(Author Rowena)

Many people headed home on Sunday morning, and those left decided to do a trip to Wiburds.

First off a wander around Yawning Gulches was undertaken. The dry cave allowed an opportunity for the climbers to show off their expertise. After this a trip to the end of the North West Passage was undertaken, with a stop off at some aragonite, where three female geology students discussed the stress fractures and proposed theories for the cave chemistry they could see, with the learned wisdom from their recent studies.

Wildlife Management



Hey guys I found a big spider. What do you think it is?



Yep that's a funnelweb all-right!! (Above photos by Don Mathews)

(The spider was carefully relocated to an area well away from the living quarters where he would not bite any cavers.)



SUSS Christmas Party. Photo by Don Mathews.

Mammoth Survey Part 3

NAKED LADY CHAMBER AREA, MAMMOTH CAVE

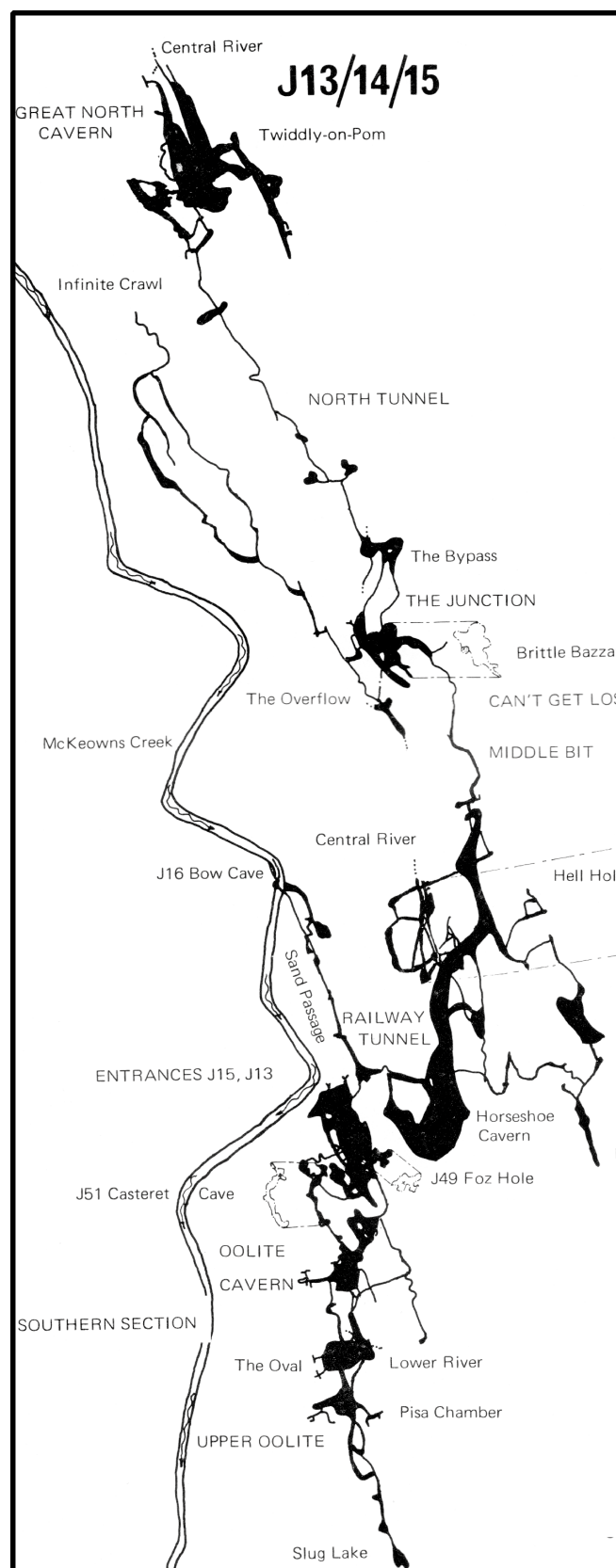
This article is the third in a series which are designed to document Mammoth Cave, Jenolan in detail as well as to publish the maps produced by SUSS over the past decade. The first of these articles was published in SUSS Bull 52-1 and covered the southern section of the cave [1]. The second article was published in SUSS Bull 52(3) and described Railway Tunnel and Sand Passage [2]. The fourth article will document Middle Bit, Dry Syphon and North West Passage.

What is it? It's not the northern end of the cave, and it's not the southern end of the cave. It's a complex, varied stretch of cave that allows a classic round trip for beginners and advanced cavers alike. It also contains the biggest discovery in Mammoth Cave in generations, a friendly dive (compared to technical monsters such as Slug Lake and Lower River), and absolutely no naked ladies. It's Naked Lady Chamber, along with the Snakes Gut route and Ice Pick Lake and World of Mud.

The Yellow Book describes Naked Lady Chamber and Snakes Gut, as well as providing a series of maps [3]. Significant discoveries in this part of the cave in recent years contributed to the decision by SUSS to resurvey the entire cave – new surveys could not be tied to old surveys because the old surveys were either lost or unable to be tied into known locations. Modern surveying techniques have sped up the mapping process and of course the data is storable and traceable. Rather than producing a static ink draft as the final product, a computer draft allows future additions and edits so that later surveys can be added without major effort.

The first of the current-project surveys in the Naked Lady Chamber area was Hell Hole, led by Ian Cooper in 2003. The main passages of the Hell Hole –Snakes Gut round trip were surveyed from 2003 – 2004. The final survey trip in this part of the cave was the scaling pole lead and passages up above the top of Naked Lady Chamber, surveyed in December 2013. The World of Mud was surveyed over a series of trips in 2010 – 2012, including some aid climbing in the higher parts. The dive surveys of Ice Pick Lake were carried out from January – May 2014.

The major extension to this part of the cave which does not appear in the Yellow Book is of course World of Mud. WoM is the largest discovery in Mammoth Cave in the last fifty years, with a surveyed length of 720 m. It contains the highest surveyed point in Mammoth, 93 m above the surface of Ice Pick Lake and 20 m above the top (J15) entrance of the cave. It's also the eastern-most point in Mammoth and as a result contains geology, geochemistry and formations which are unknown elsewhere in the cave. Other sections of the cave which are presented here but which were not mapped at the time of the Yellow Book:



Mammoth cave – from Dunkley (3)

- Ice Pick Lake. The dive's a mixture of phreatic and rift passage, dropping to about -16 m depth. For the most part, it's pleasantly sized for a diver with modern gear, being one to two metres wide and several metres high. Some of the rift passage extends above and below the dive line beyond the reach of a torch. The surveyed length of the dive is 106 m, with unexplored leads, and known passage which is unsurveyed to date.
- Central River downstream of Central Lake. This is normally flooded. During an extreme drought it presents a difficult challenge, with tight passage which was surveyed for 33 m before it all became too unpleasant [4].
- The scaling pole lead above the entrance to Hell Hole route. This climbs steeply into a dripping inlet and sharply-eroded bedrock. There's 20 m of passage up there.
- The scaling pole lead at the top of Naked Lady Chamber [4] turned out to lead past a crystal pool into a stream inlet and down a muddy passage in the direction of Railway Tunnel. This previously unknown stream passage totalled 92 m.

While the dry passages of this area presented survey challenges (particularly in World of Mud), these could be handled by conventional techniques. On the other hand the underwater surveying cannot use a laser device such as the Disto X, or the Suunto sighting compass/clinometers. The dive in Ice Pick Lake was surveyed by placing one diver in the lead with a dive computer, a bushwalking compass and a fibreglass tape measure. A second diver remained at the previous end with the end of the tape measure. The lead diver took a back sight with the compass along the dive line at each point where the dive line was deflected around a corner. They then measured the distance on the tape and the depth from the computer and drew as much wall detail as they could see. In the Ice Pick Lake surveys, the lead diver generally stayed ahead of the zero-visibility muck that was generated by the diving (the poor person at the other end of the tape generally had no visibility at all!). The good visibility allowed a reasonably fast survey compared to some other Jenolan diving explorations.

Phil Maynard



Ian Cooper at the turn off from Railway Tunnel to the Hell Hole route. Photo by Alan Pryke

DESCRIPTION

Hell Hole

From Railway Tunnel, head south along a muddy passage, across a pool of water. Ignore the junction at the pool – the passage which heads east from here goes into a maze of muddy passages of not much consequence. Head south from the pool and up a slope to a junction. East from here leads to Hell Hole, while south east leads to a climb which bypasses Hell Hole. To go through Hell Hole, head east through a wet crawl and into a phreatic chamber. From here climb up through the flattener. It is generally easier to do this on your back. Once through Hell Hole, there's a high rift on the eastern side of the squeeze running south and climbing steeply. Follow this up to the south, ignoring side passages, and finally climb up four metres in a tube to reach the rockpile at the top. There is the possibility of loose gravel falling onto party members below while in this climb.

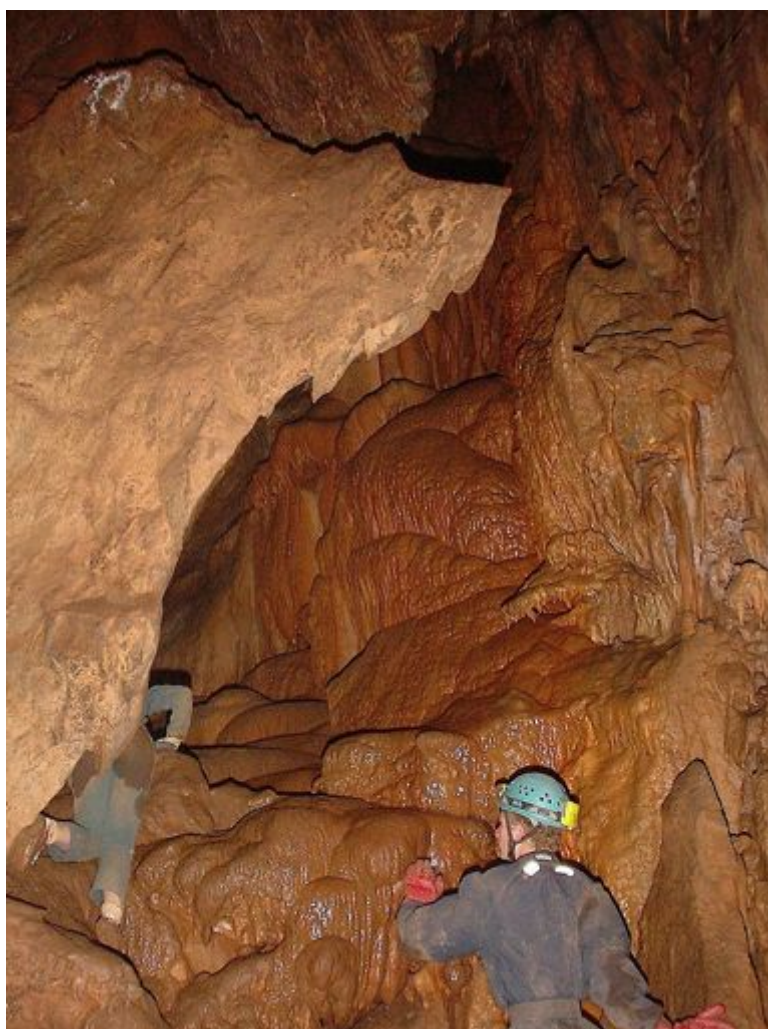
If you are taking the bypass around Hell Hole, continue up the slope to the south east from the junction. Climb the smooth five metre bedrock slope (a handline tape will assist some party members here). At the top of the climb, bridge eastwards over a slippery rift using the foothold ledges which are higher up than you expect. This leads through a hole into the rockpile and you will find yourself at the top of the 4 m climb at the end of the Hell Hole route.

Naked Lady Chamber

From the top of the climb above Hell Hole, scramble south into the rockpile, and down a 2 m climb into a rockpile chamber. On the eastern side of this is a tight hole through to a south-trending rift which rapidly becomes very tall. This is the upper entrance to Naked Lady Chamber.

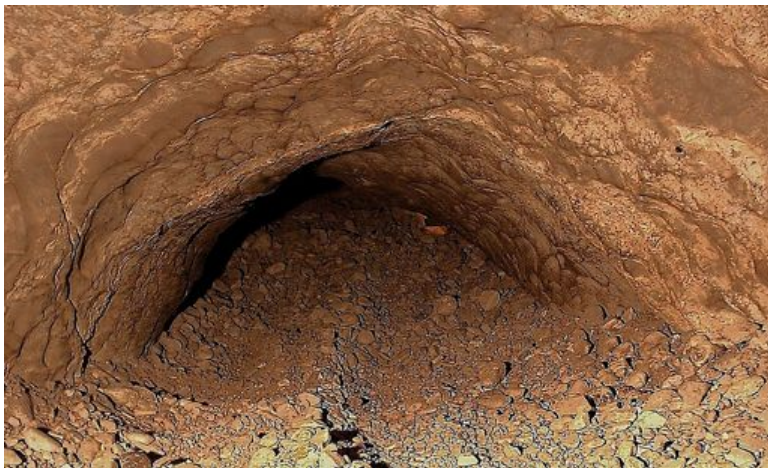
Climb over flowstone to the south. A climb up the rockpile here leads to the scaling pole pitch into the exploration leads above Naked Lady Chamber. The main way on is down a 3 m climb to the south, opening up into a large and well decorated section of the chamber. Scramble down the rockpile to flat floor, then bypass the very large boulder on either the eastern or western side. Down on the southern side of the boulder, there is a slippery climb down a mud slope to a muddy, flat area. This is the lower end of upper Naked Lady Chamber. Many groups stop for a break here. From here, a passage heads back north underneath the upper chamber, with some good decoration.

The way on from the muddy flat area is south down a slippery 2 m climb. Most groups rig a tape down this climb for the return trip. At the bottom of the climb, turn east, past a pitch on the southern side, to a tube heading down to the south. This drops through a squeeze onto a climb down. Most groups rig a tape down this climb. At the base of the climb, scramble down rockpile to the base of the chamber, then climb up a 2 m ledge at the southern end of the chamber. At the top of the climb is a muddy slope. Up the slope is the entrance to World of Mud. Down the slope is the junction with Snakes Gut.



Climbing through Naked Lady Chamber. Photo by Paul Lewis

Snakes Gut



Gravel squeeze in Snakes Gut. Photo by Paul Lewis

Snakes Gut can be entered by heading south from Central Lake or climbing down from Sugar Cubes. Either way, you wind up at Abusive Intrusive. From there, climb down into the south-trending rift and enjoy the snakiness of it all. The roof of the rift eventually lowers and the passage turns into a meandering phreatic tube, which winds around to the east. This reaches a low chamber with a tight side passage on the northern wall. This leads down to permanent water, apparently a part of Central River.

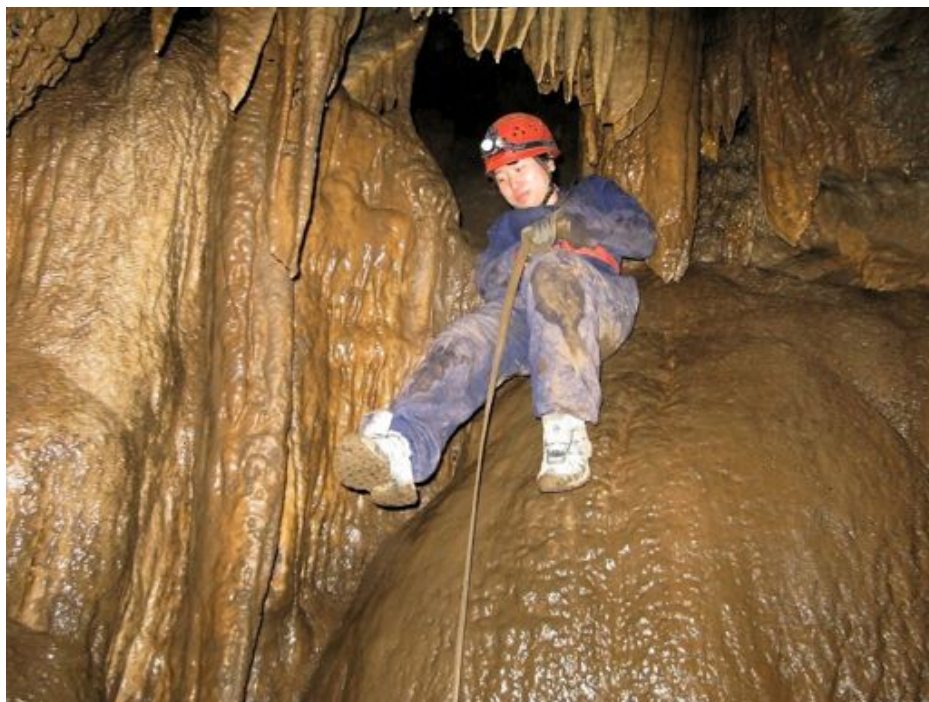
The way on from the chamber is to the east through a tight gravel squeeze and up a slope into large passage. Climb down a slope to a tight easterly-trending passage. This passes through several squeezes in bedrock and then rockpile and eventually climbs up into the lower end of Naked Lady Chamber.

Ice Pick Lake

From the junction of Naked Lady Chamber and Snakes Gut, head south down the slope. There is some flowstone floor before the passage drops 4 m down a climb to the west. This leads to a low passage filled with stream gravel which appears to be a flood overflow of Central River. Before the 4 m climb, there is a junction and passage up to the south. This goes through a crawl, and down a 2 m climb in a moderate sized chamber. The floor slopes steeply down to the south, and in the southern wall there is a window in formation. This looks out over Ice Pick Lake. The 3 m climb through the window down to Ice Pick Lake is slippery and normally needs a handline for the return climb.

The chamber containing Ice Pick Lake floods regularly and is very muddy and slippery underfoot. To the south, the lake shore is reached after 0 – 20 m, depending on the water level. The lake rapidly drops off to about 8 m depth, and a swim is necessary to cross the lake. On the south-eastern branch of the lake, there is a narrow shelf underneath the eponymous Ice Pick climb. This is a slippery 6 m climb to a small series of muddy rockpile chambers, with no prospects.

Central River enters Ice Pick Lake from a sump at the north-western corner of the lake. The upstream dive is not surveyed, but reportedly goes some distance (30m?) and is tight and ugly all the way. The downstream exit is in the south-western branch of the lake, but strangely enough not at the end – it's a hole in the south wall of the south-western branch of the lake, about 7 m down. This has been surveyed trending south and west for over a hundred metres, for the most part in moderate-sized phreatic passage. The dive goes down to a depth of 16 m before rising to a surface and chamber. There are unsurveyed known passages and unexplored leads in the southern end of the dive.



Kandy Wang on the climb down to Ice Pick Lake. Photo by Rowena Larkins

World of Mud

Climb up the mud slope in the bottom (southern) end of Naked Lady Chamber. At the point where this leads to a steep drop, the entrance of World of Mud is a small tube heading back to the south (it's a tight passage). This leads to a junction splitting north/south. Turn right and crawl south to an overhung 4 m pitch. This can be rigged as a short ladder pitch from a bolt.

At the base of the ladder, head east across the muddy chamber to a squeeze. This leads to an easterly-trending crawl that eventually allows you to stand up. Head north along the passage until you reach a junction with a big slope coming down from the east. This contains a permanent trickle of water which flows into a gravel squeeze to your left (west). The stream passage to the west chokes in wet gravel. Ahead to the north there is a passage leading to a tight squeeze in wet gravel. After a few metres of grovelling, this has an opening on the western side. This is the Potato Patch – a large water inlet aven with some formation on the floor. The grovel passage continues north from the Potato Patch but soon chokes.

Back at the main junction, the significant way on into World of Mud is up the big slope to the east. Climb up wet mud and gravel in a large chamber. The slope gets progressively steeper towards the top, and you eventually reach a fixed handline that assists in getting up a muddy 4 m climb. At the top of the handline, step around to the right (south) side of the big boulder, and continue up a steep slope of mud and shale in big passage. At the top of the slope, climb around onto a ledge that runs left (north) beside some good



**Rowena Larkins on the ladder into WoM.
Photo by Paul Lewis**



Snowfields. Photo by Paul Lewis

formation before opening out onto big rockpile. Clamber east over the rockpile and then south until entering a huge chamber. This is Toms Kitchen, and it's a complex junction in the cave as well as a major destination in its own right. The very large slab on top of the rockpile on the north western side of Toms Kitchen is a suitable rest/lunch spot.

To go into the upper levels of World of Mud, there are two choices. In the northwest corner of Toms Kitchen, a crawl leads to a steep slope up to the north east. This reaches a corner with spectacular aragonite, then swings north west and climbs steeply into a squeeze. At the exit of the squeeze, you will find yourself at the base of a 3 m climb composed of unconsolidated gravel (The Wall of Death). There is a fixed handline here which assists the climb up. At the top of the climb, go through the tight squeeze into a sizeable chamber. This is a complex junction near the top of the cave.

To the west and north of the chamber, a series of loop passages give access to rockpile and also to an aven with a fixed rope hanging down. This is a 7 m SRT pitch to the highest levels of World of Mud, largely composed of rockpile. To the east of the chamber, there is a squeeze which opens out into a substantial chamber. On the eastern side of the chamber is a difficult 5 m climb with a fixed handline. Climb this into a passage with shale bands in the walls and roof and aragonite crust on the walls. There is a climb down on the southern

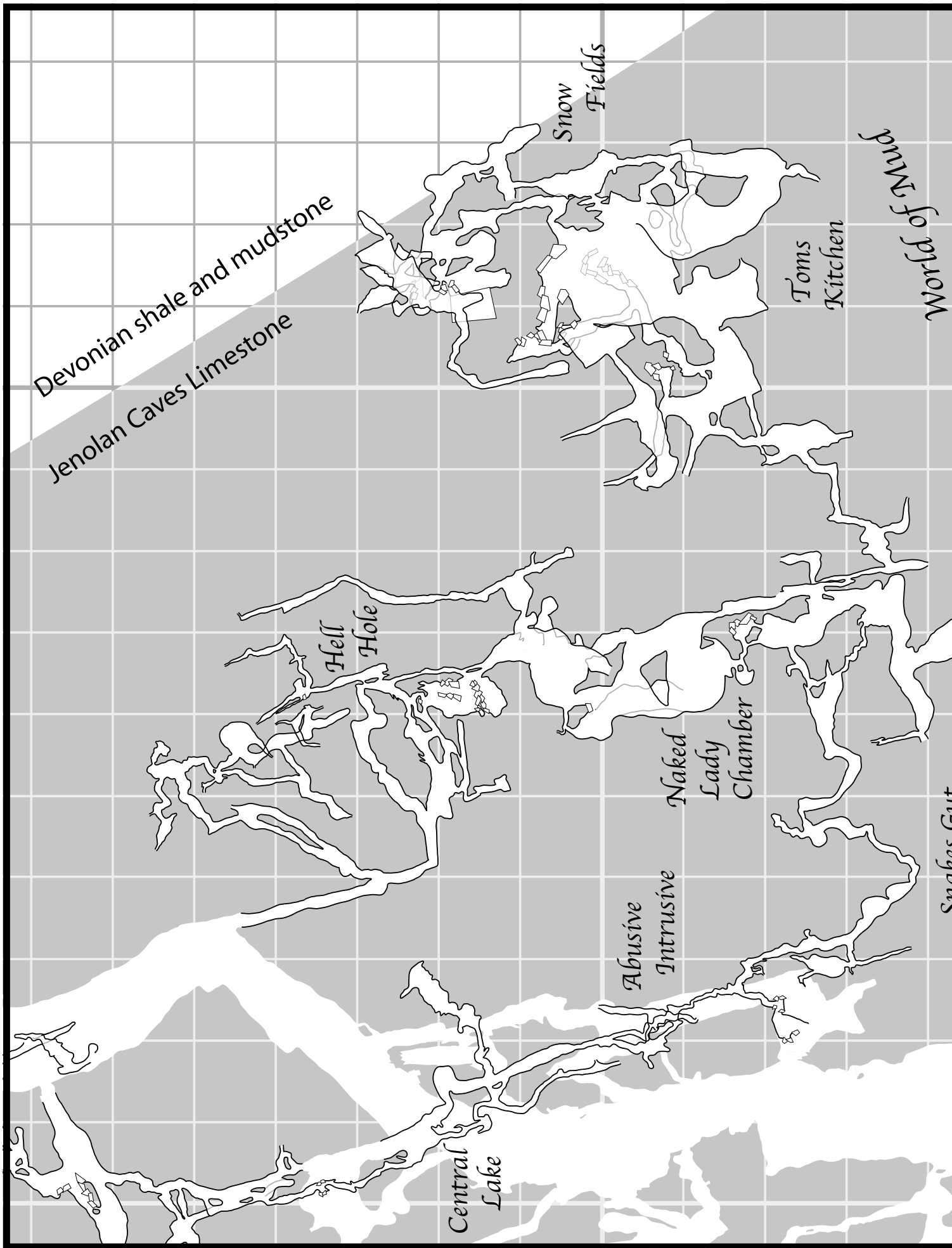
side of this passage. Climb down this and at the bottom there is a junction to the east out of the passage. This is the access to the Snowfields.

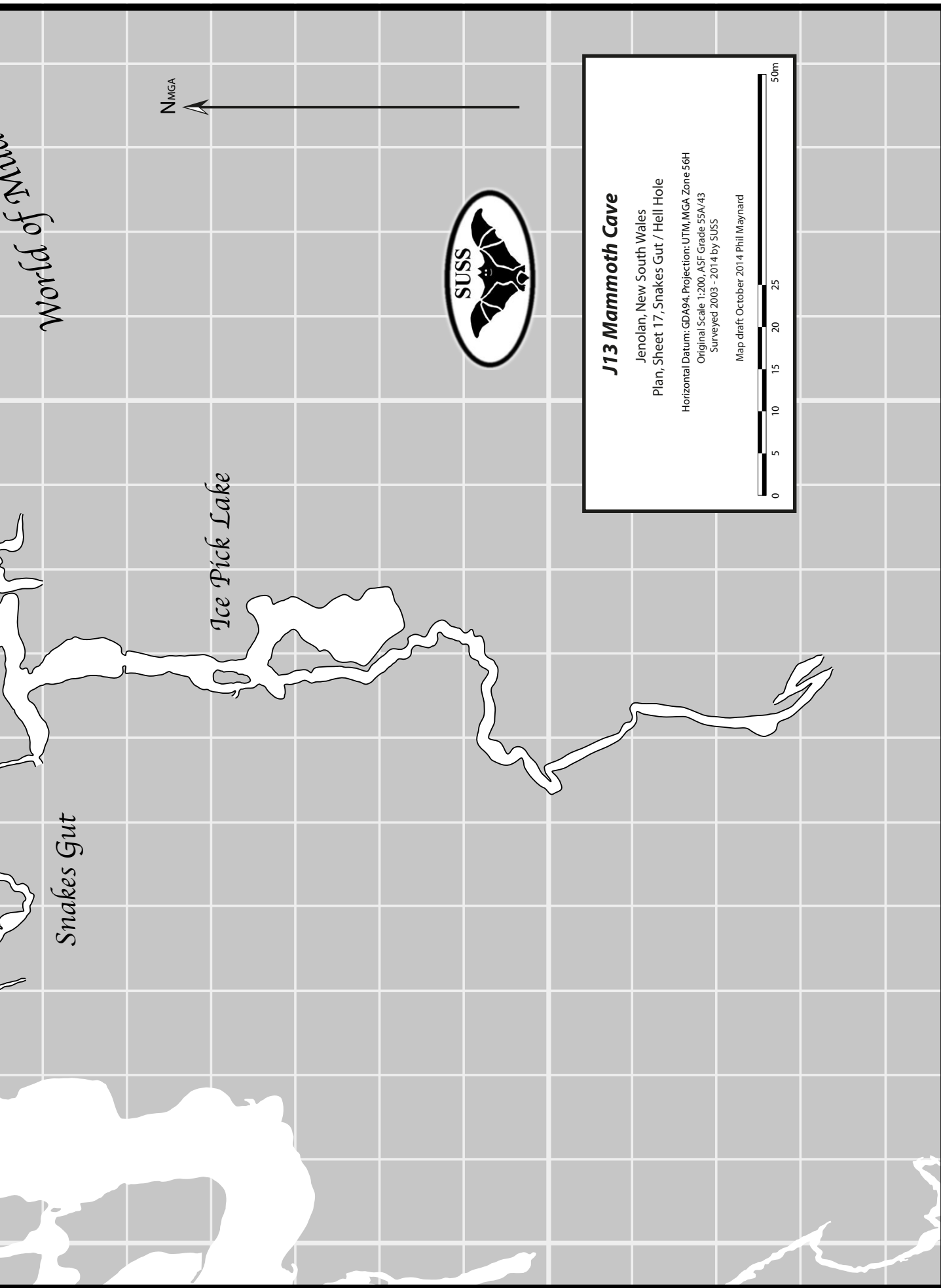
The Snowfields is an access-restricted part of the cave due to the quality of the aragonite formations and the risk of dropping soil onto them down the access route. There are barriers erected in the muddy slope of the climb down into the chamber in an attempt to deflect falling mud from the formations, but this is only partly successful. If you have access and you are going to climb into the chamber containing the Snowfields, you need to exercise great care on the way down and back up to prevent a rain of debris onto the formations. The chamber is a dead-end; the only ways on are up an east-trending slope full of the aragonite formations (NO!), or down to the south leading to a 12 m pitch back into the top of Toms Kitchen. The ledge at the top of the eastern slope can be reached by a different access route (see below).

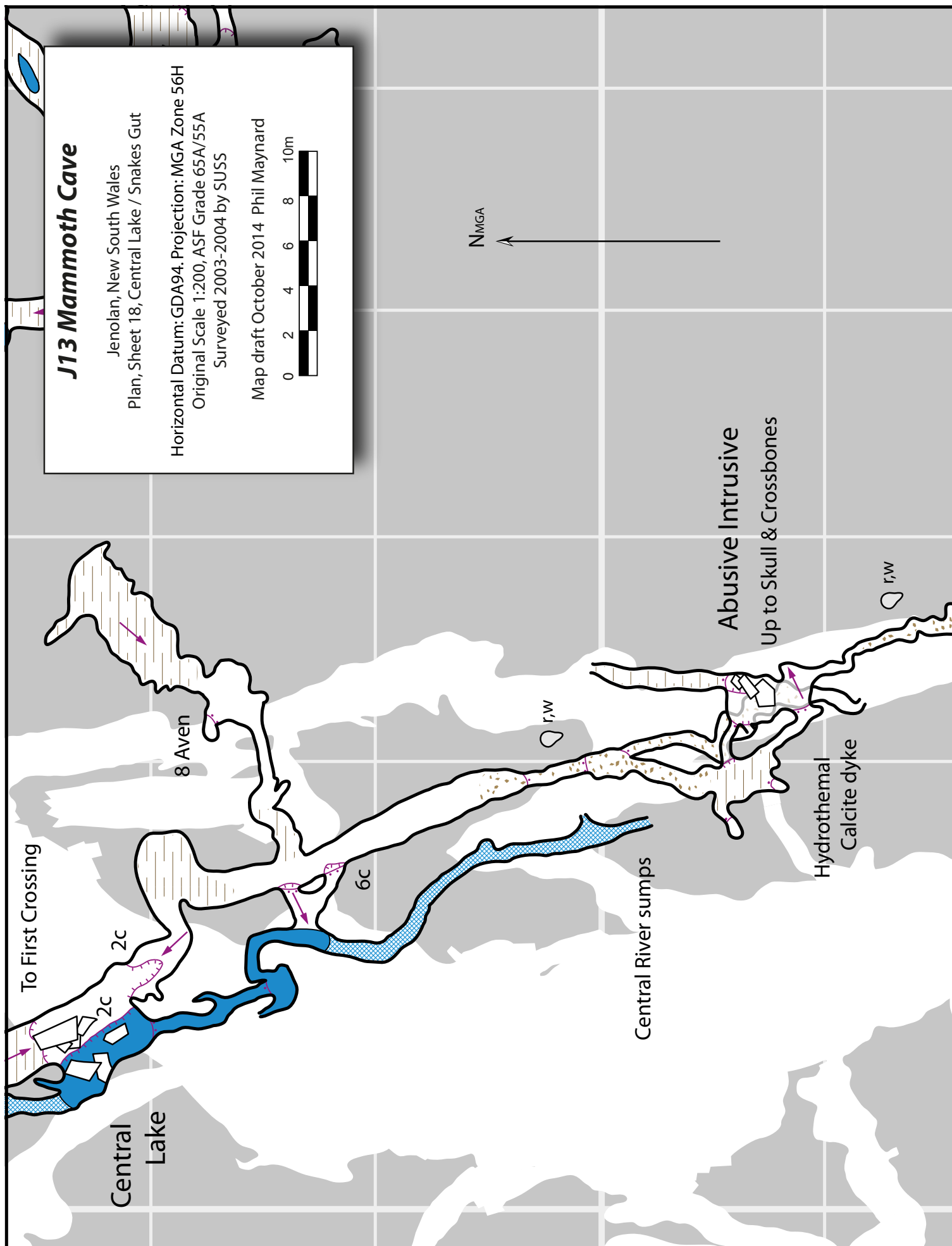
On the eastern side of Toms Kitchen, a 2 m climb onto a ledge leads to a steep, muddy slope. Climb this as it gets progressively steeper, and you enter a muddy tube rising steeply to the north east. At the top of the climbs there's a squeeze which opens out to a junction. To the left (west), this passage climbs a steep slope through a squeeze. At the top of the squeeze the passage opens out to a ledge. This looks down on Snowfields. To the right (north east) from the junction, the passage climbs steeply up and then around to the east. At the top of the climbs the passage opens out over a pitch into a large chamber. This can be rigged off bolts. The pitch leads to a steep slope (The Vortex). Down to the south, this slope funnels into a pitch into Toms Kitchen. Up to the north, the chamber continues to a high level (almost the highest point in Mammoth Cave). Staying attached to the rope for the first part of the climb is a good idea. Where the high level passage swings to the west a slippery, belayed climb across a pit is necessary. There is some aragonite in this part of the passage.

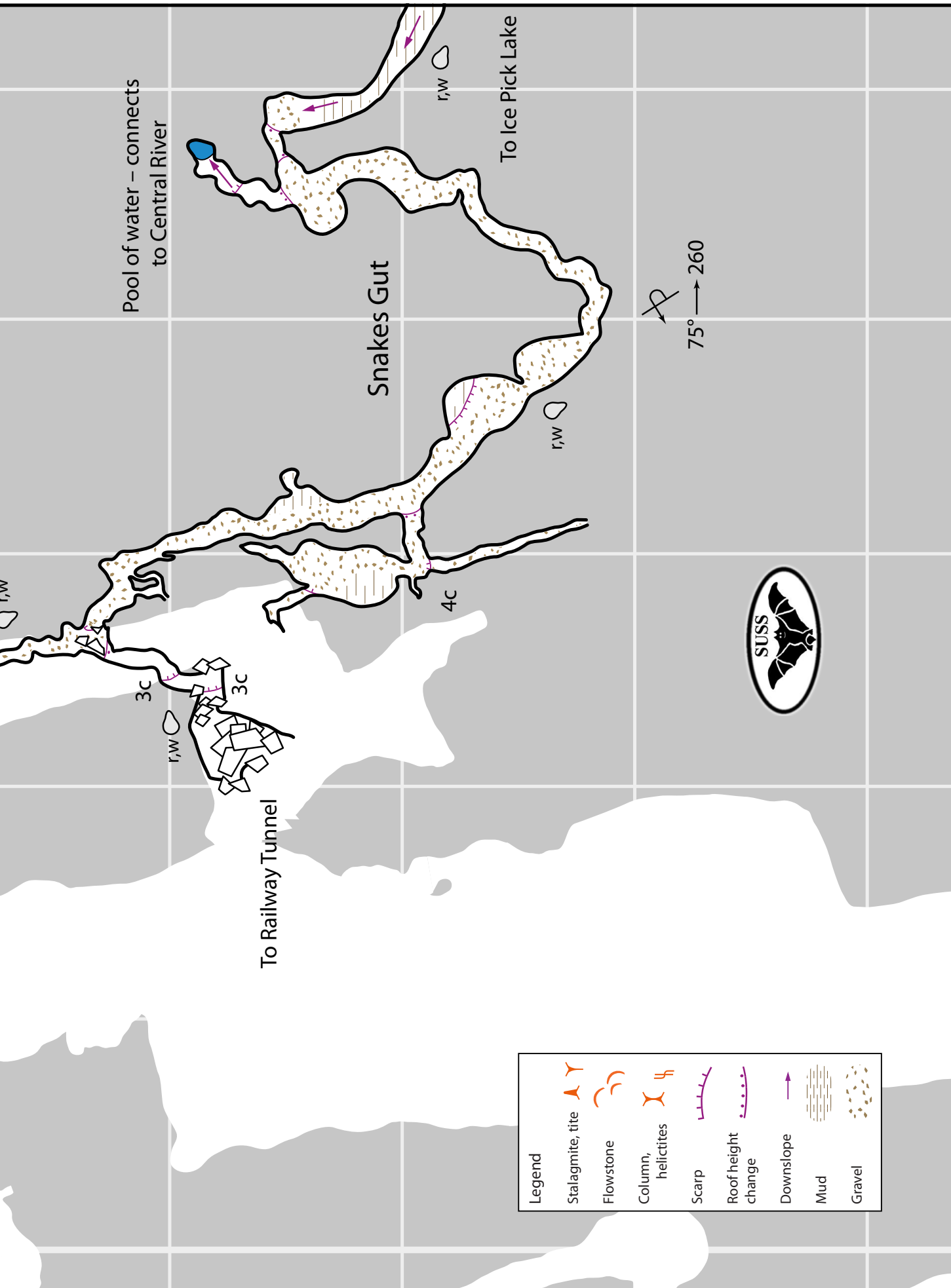


Aragonite in World of Mud. Photo by Rowena Larkins







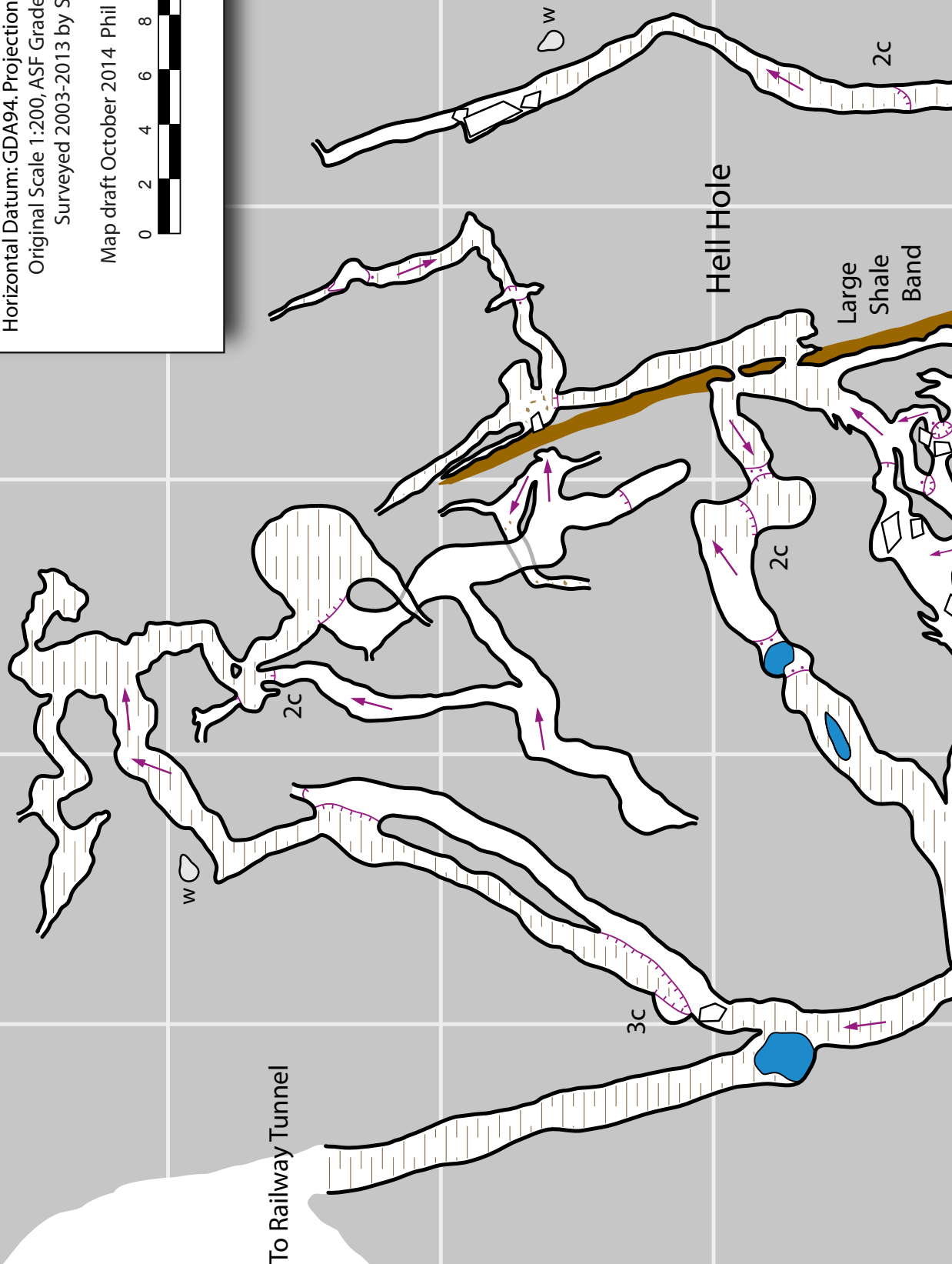


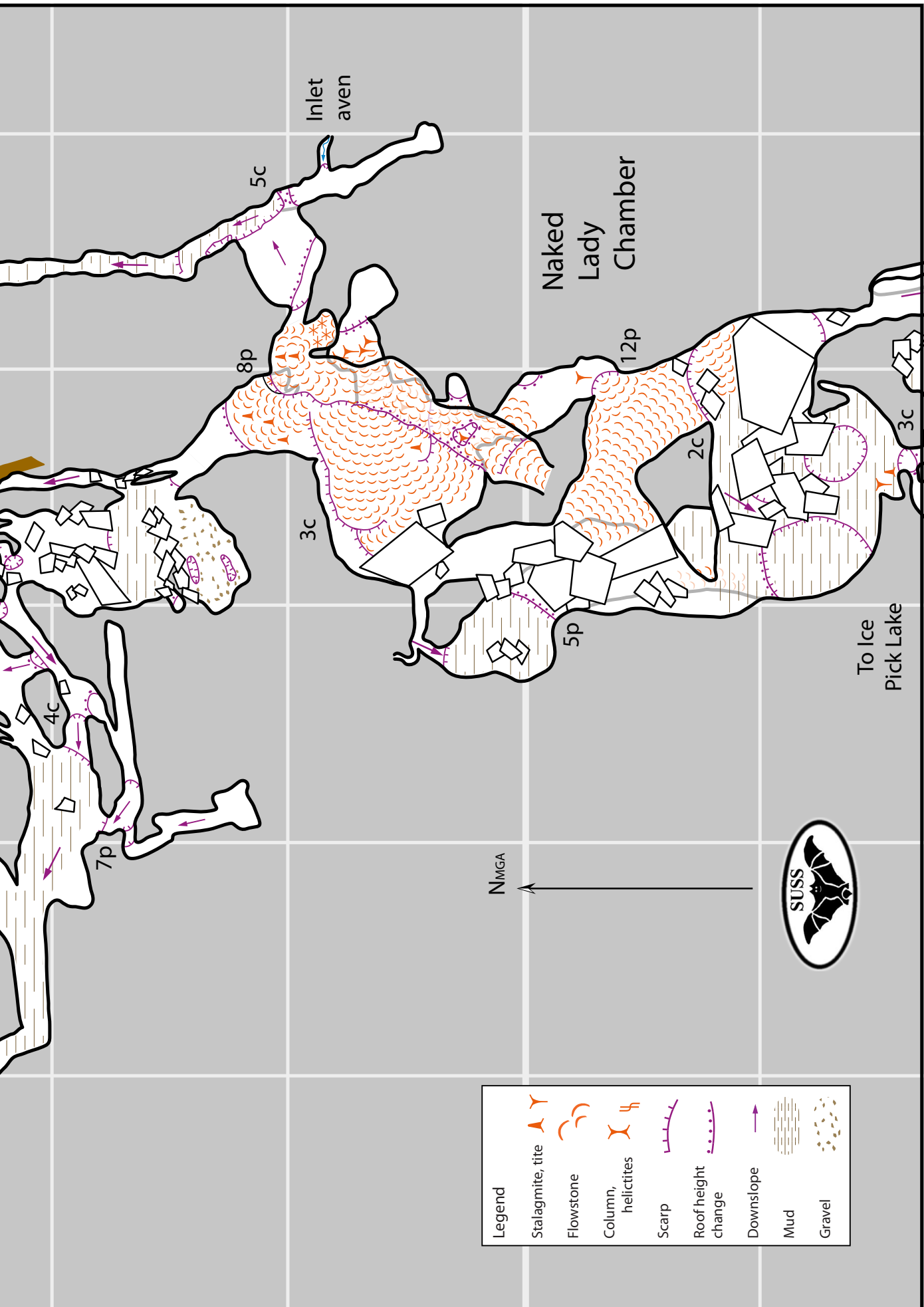
J13 Mammoth Cave

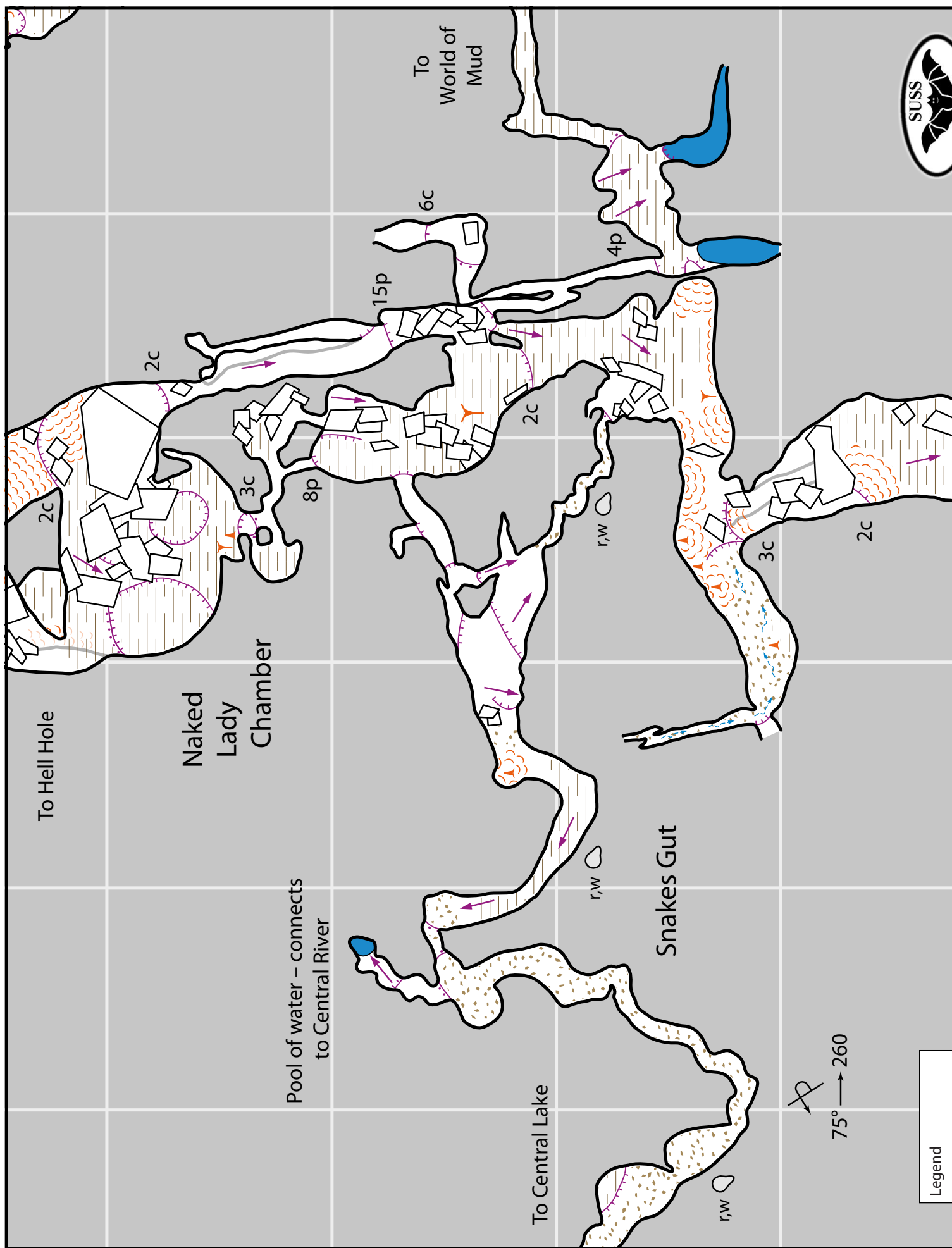
Jenolan, New South Wales
Plan, Sheet 19, Hell Hole / Naked Lady Chamber

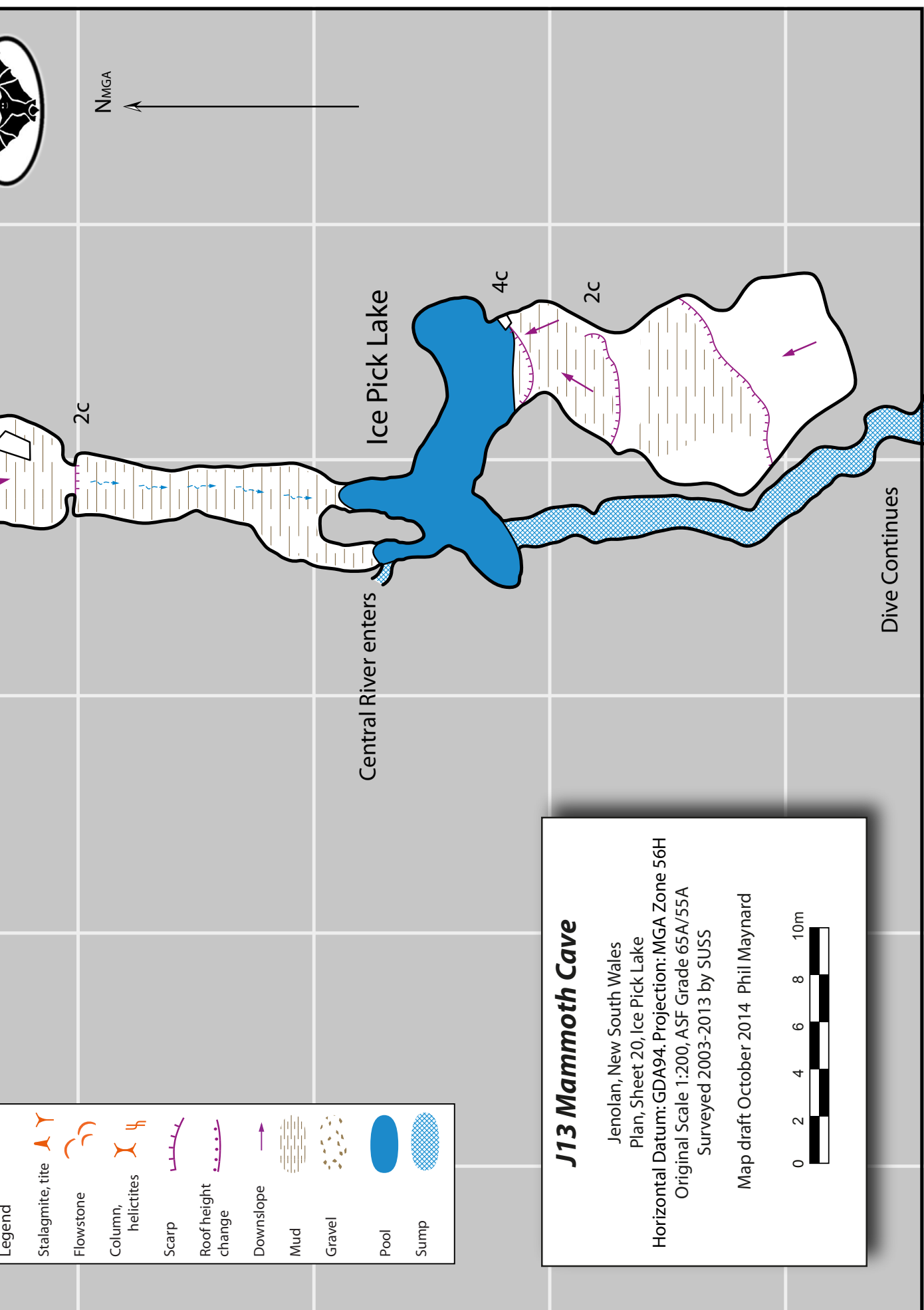
Horizontal Datum: GDA94. Projection: MGA Zone 56H
Original Scale 1:200, ASF Grade 65A/55A
Surveyed 2003-2013 by SUSS

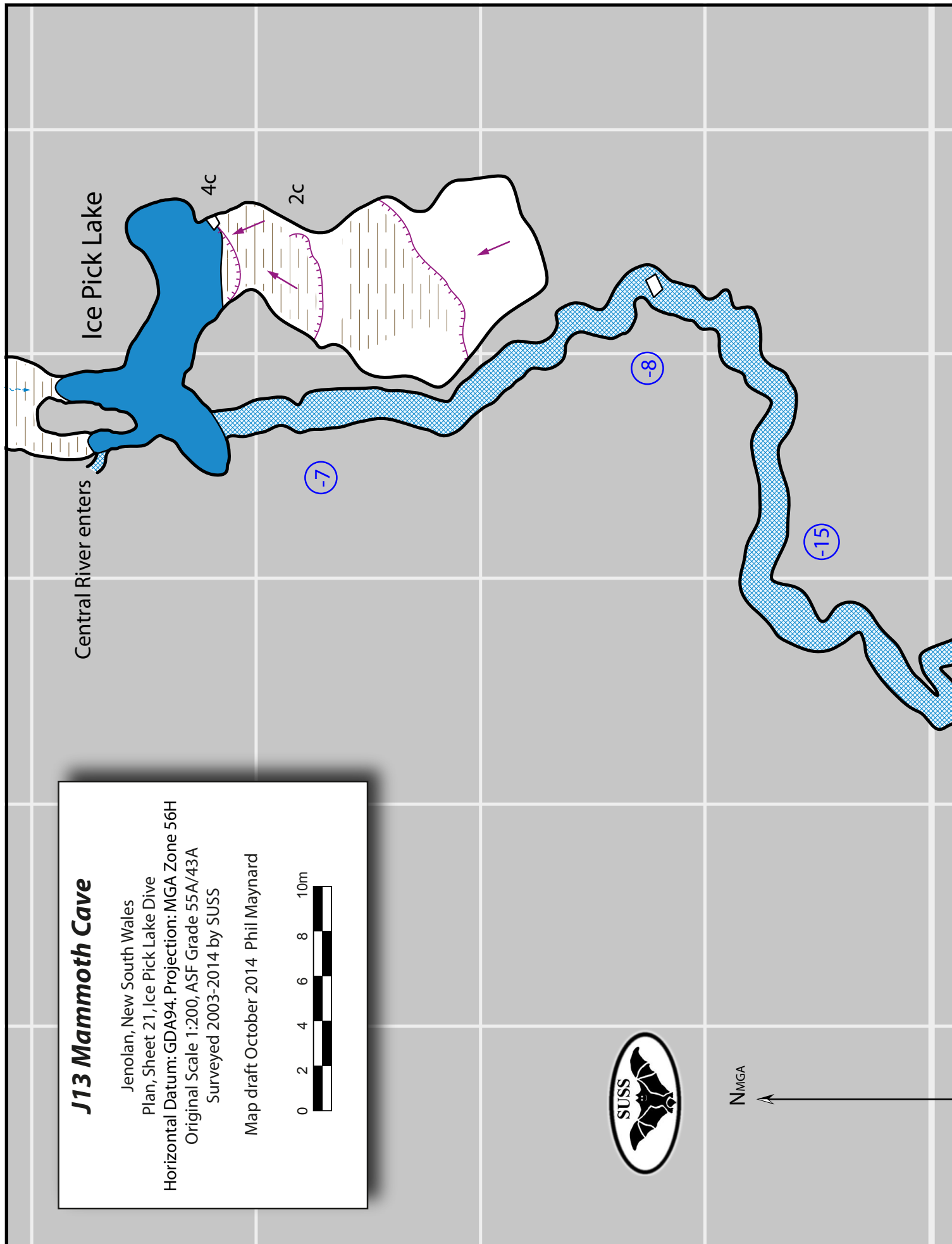
Map draft October 2014 Phil Maynard









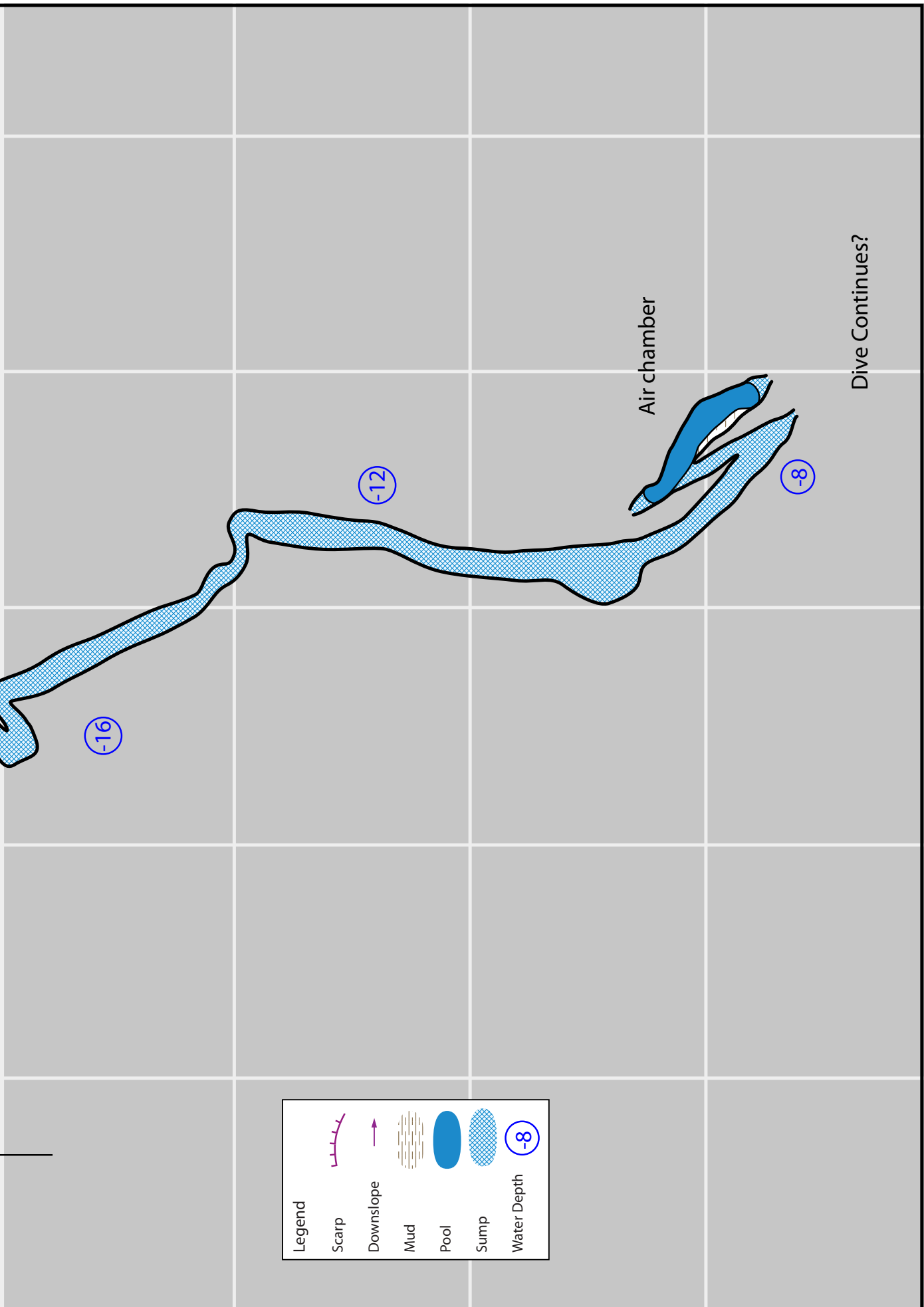


J13 Mammoth Cave

Jenolan, New South Wales
Plan, Sheet 21, Ice Pick Lake Dive
Horizontal Datum: GDA94. Projection: MGA Zone 56H
Original Scale 1:200, ASF Grade 55A/43A
Surveyed 2003-2014 by SUSS

Map draft October 2014 Phil Maynard

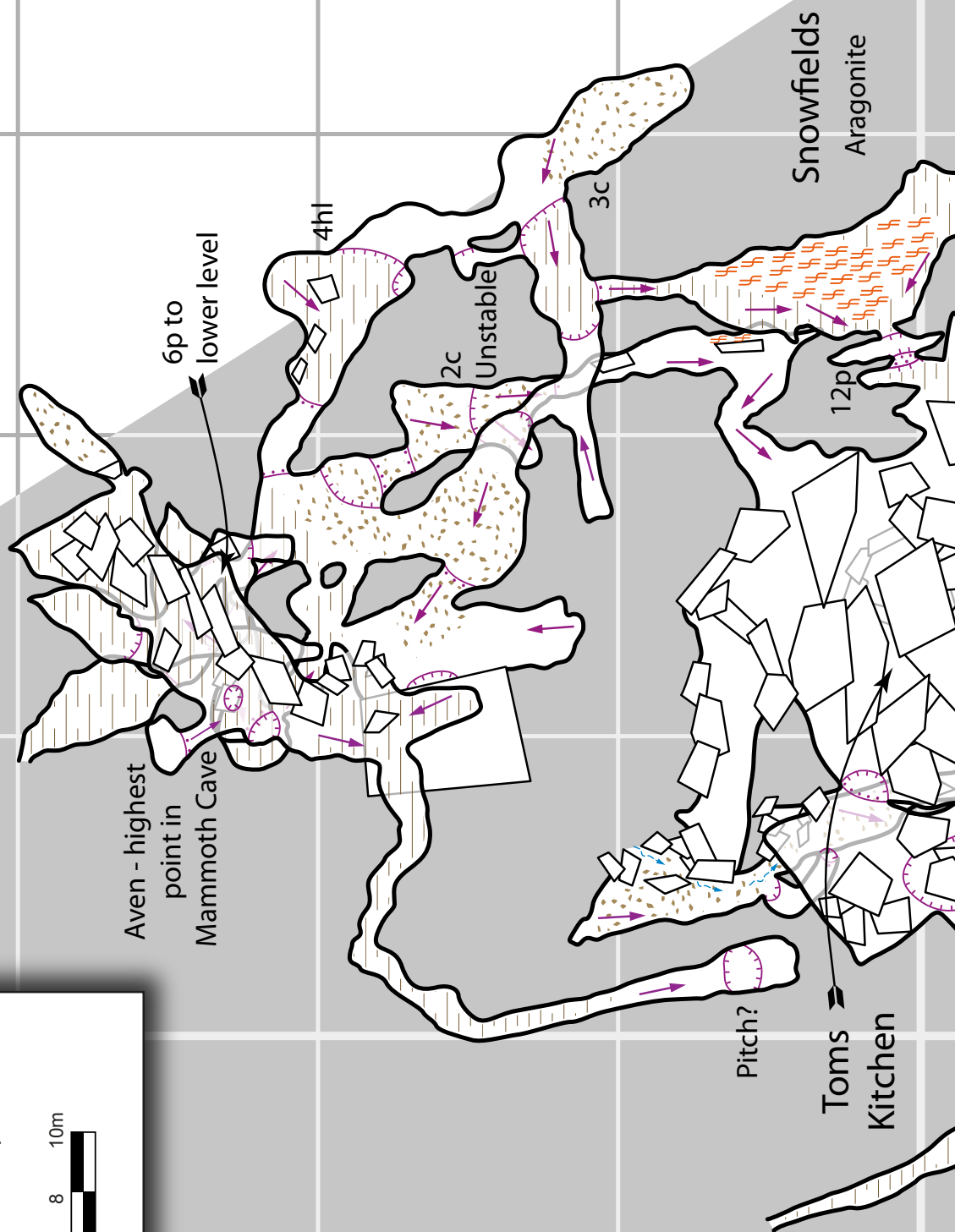
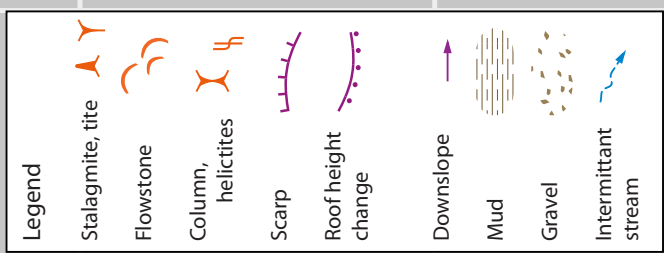




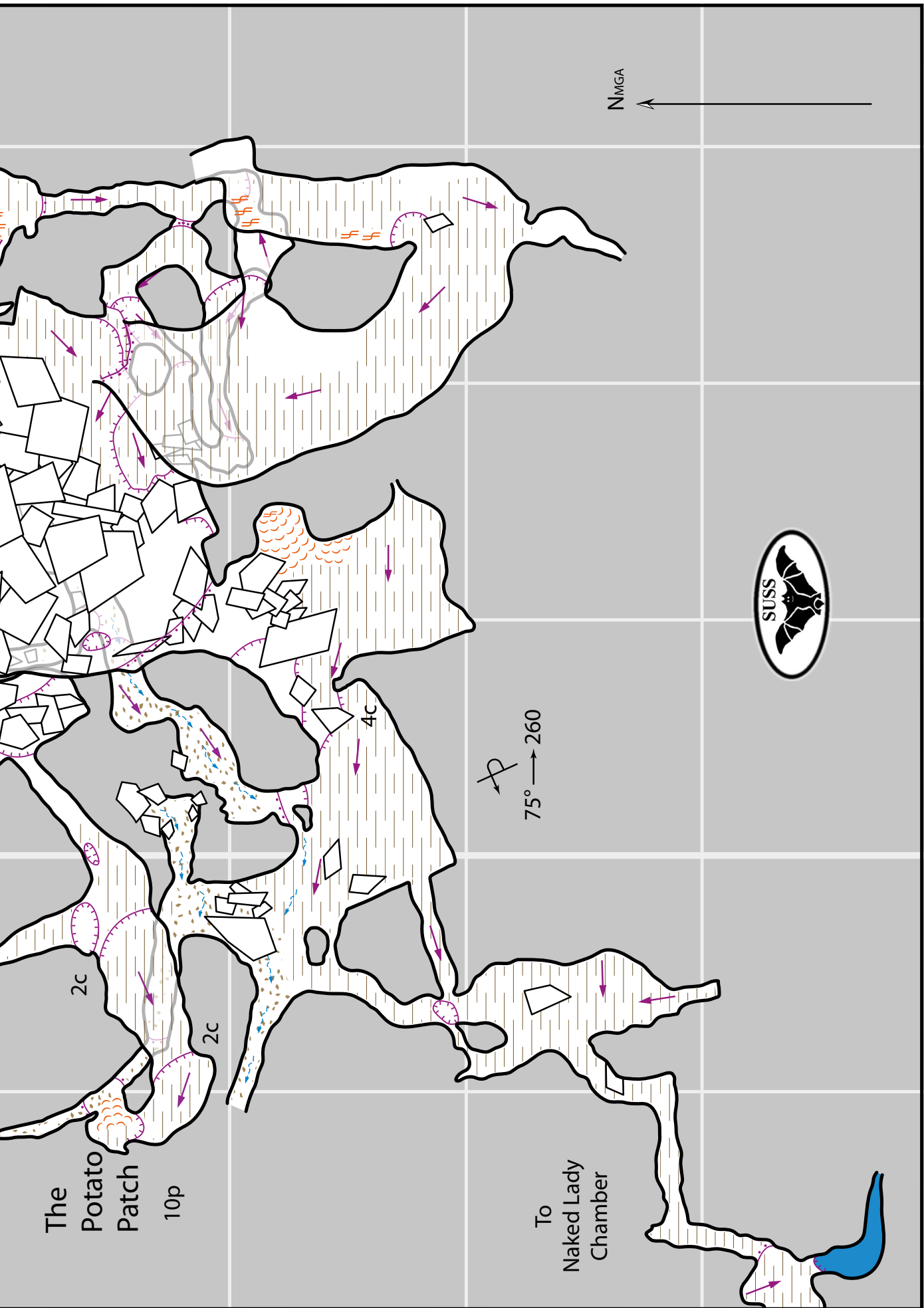
J13 Mammoth Cave

Jenolan, New South Wales
 Plan, Sheet 22, World of Mud
 Horizontal Datum: GDA94. Projection: MGA Zone 56H
 Original Scale 1:200, ASF Grade 55A/43A
 Surveyed 2010-2012 by SUSS

Map draft October 2014 Phil Maynard



Jenolan Caves limestone
 Devonian shales and mudstone

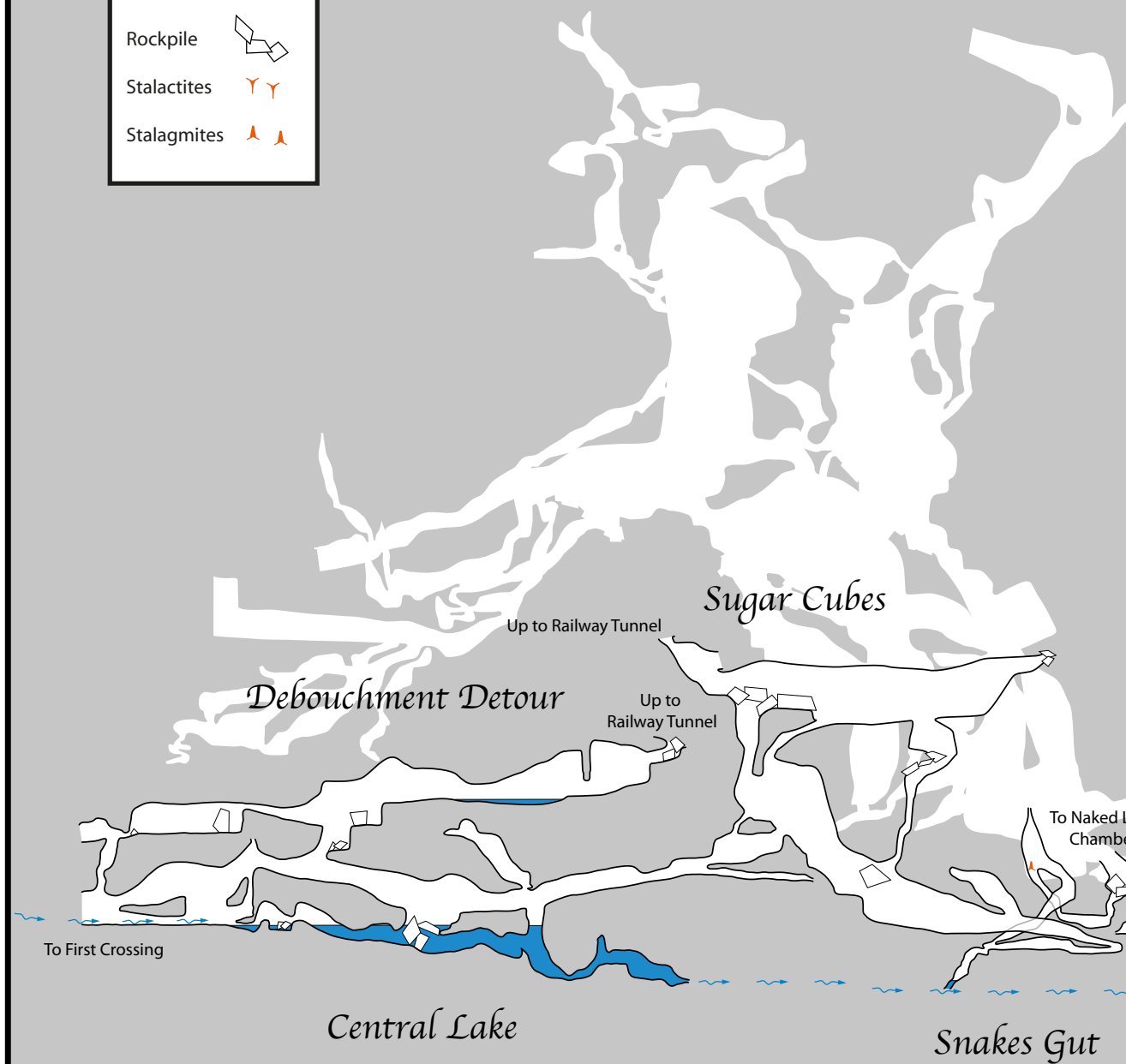


Legend

Rockpile

Stalactites

Stalagmites



J13 Mammoth Cave

Jenolan, New South Wales
Elevation, Sheet 4, Snakes Gut

View towards 080 grid MGA, No Vertical Exaggeration
Original Scale 1:200, ASF Grade 65A/55A
Surveyed 2003 – 2014 by SUSS

Map draft October 2014 Phil Maynard



Naked Lady
Chamber

Ice Pick Lake

Dive
Continues



Legend

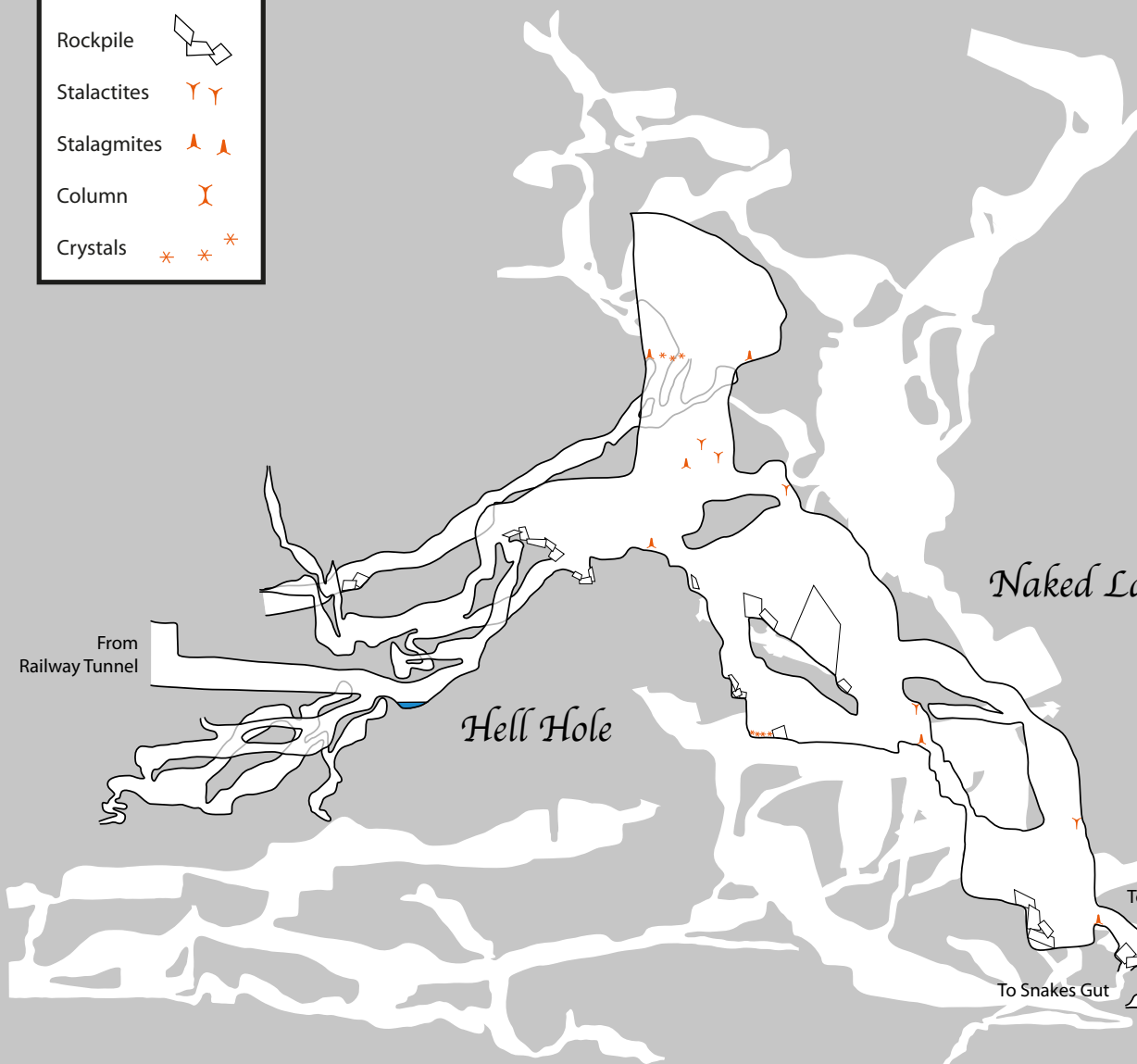
Rockpile

Stalactites

Stalagmites

Column

Crystals



J13 Mammoth Cave

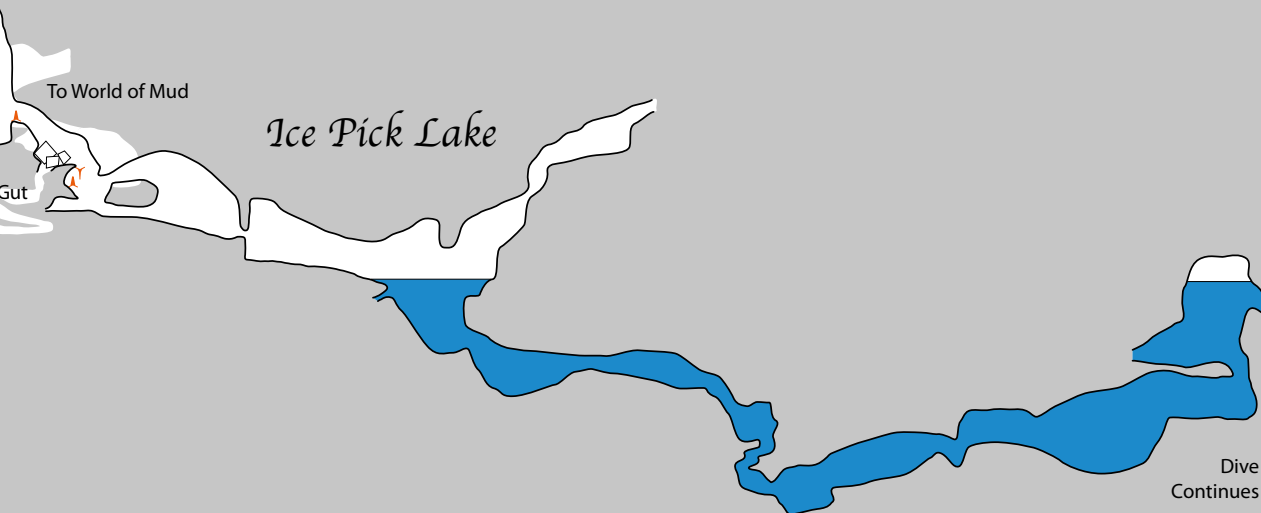
Jenolan, New South Wales
Elevation, Sheet 5, Naked Lady Chamber

View towards 080 grid MGA, No Vertical Exaggeration
Original Scale 1:200, ASF Grade 65A/55A
Surveyed 2003 – 2014 by SUSS

Map draft October 2014 Phil Maynard



Naked Lady Chamber



Legend

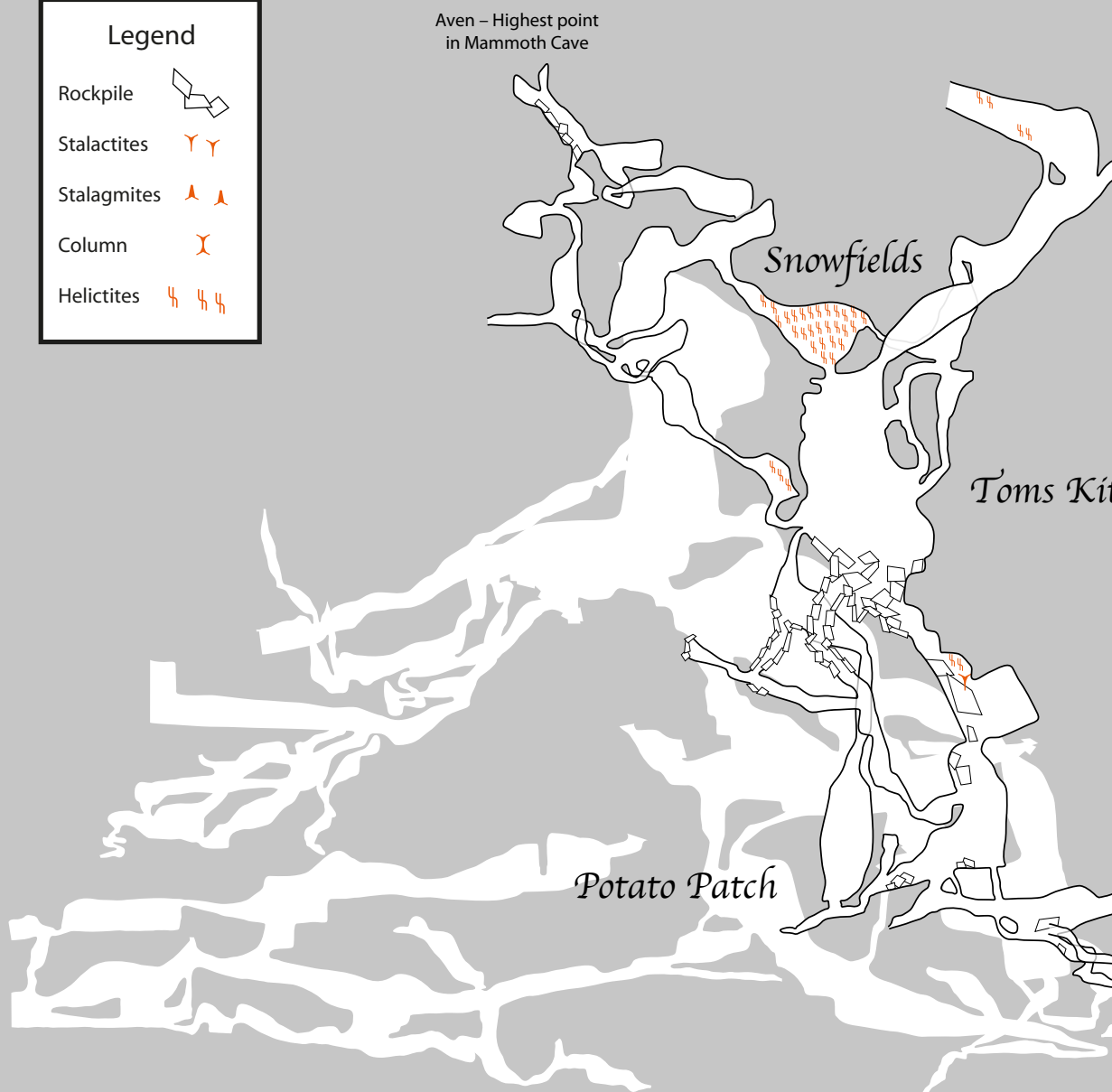
Rockpile

Stalactites

Stalagmites

Column

Helictites



J13 Mammoth Cave

Jenolan, New South Wales
Elevation, Sheet 6, World of Mud

View towards 080 grid MGA, No Vertical Exaggeration
Original Scale 1:200, ASF Grade 65A/55A
Surveyed 2003 – 2013 by SUSS

Map draft October 2014 Phil Maynard



Kitchen

To Naked Lady Chamber

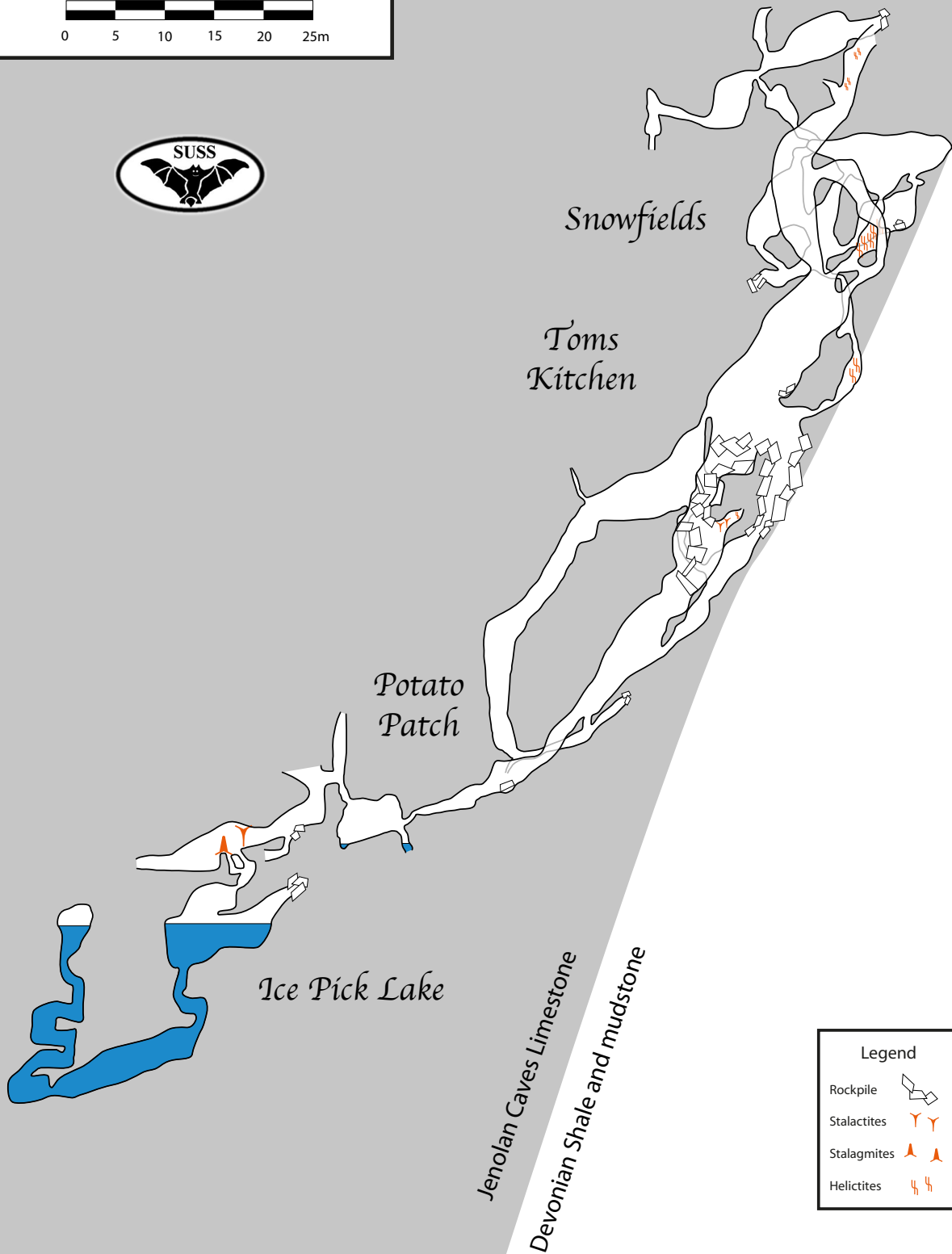
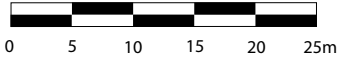


J13 Mammoth Cave

Jenolan, New South Wales
Elevation, Sheet 7, World of Mud

View towards 350 grid MGA, No Vertical Exaggeration
Original Scale 1:200, ASF Grade 65A/55A
Surveyed 2010 – 2012 by SUSS

Map draft October 2014 Phil Maynard



Legend

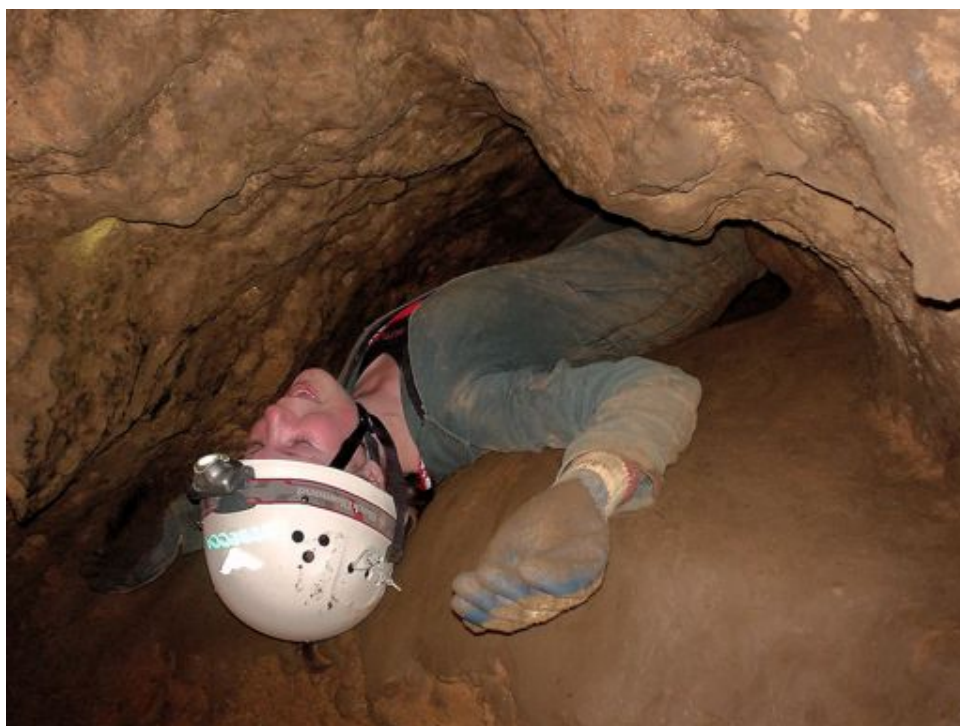
- Rockpile
- Stalactites
- Stalagmites
- Helictites

HISTORY OF NAKED LADY CHAMBER AREA, MAMMOTH CAVE

Naked Lady Chamber / Snakes Gut

Jeremiah Wilson was the first Keeper of the Caves at Jenolan. In the Yellow Book, Dunkley states that Wilson's explorations in Mammoth Cave extended as far as Ice Pick Lake and that his initials have been found off Naked Lady Chamber [3]. In his guidebook to the Jenolan Caves published in 1890, Foster apparently describes this section of cave following on from his description of Railway Tunnel:

"At the bottom we find another series of chambers and passages, nearly all containing fine deposits. To reach many of them we have to move slowly along, wriggling snake-like in and out of small rocky holes. In some places it is necessary to move in a less dignified manner than the cursed snake himself, for we are absolutely compelled occasionally to travel backward, squeezing feet foremost, and dragging our candles after us." [5]



Hell Hole. Photo by Paul Lewis

It's debatable whether this really describes Naked Lady Chamber, but the two access routes from Railway Tunnel (Snakes Gut and Hell Hole) are both obvious side passages off the Tunnel and it's not surprising if Wilson penetrated as far as Ice Pick Lake.

The speleologists certainly knew about this area early on. After the formation of SUSS in 1948, Mammoth Cave immediately became a focus of exploration. Henry Fairlie-Cuninghame describes a flooded Snakes Gut in 1952:

"An attempt was made to find the underground lake entered through the Central Level of the Mammoth Cave. According to reports, the route was past the names pencilled on the wall of a side passage off the Central Level, over the large fallen rocks and along to the end of the large passage beyond these rocks. At the end of this passage a way is found down through large rocks to a narrow, vertical cleft about 20 feet deep in solid rock, at the bottom of which there are several passages, one of which leads along a tortuous path to a water filled tunnel. Allegedly there was sufficient air above the water to get through to the lake, but it was found that the tunnel was completely filled with water and progress was impossible." [6]

In 1955, Barry Mason casually describes reaching Central River via Skull and Crossbones in a dye tracing article [7]. It's clear that this was simply a known part of the cave by this stage.

The main work to collate, trace and re-draft existing maps for the Yellow Book was undertaken by Ted Anderson and John Dunkley from 1968 to 1972 [3]. The map of Naked Lady Chamber and Ice Pick Lake area produced for the first edition of the Yellow book was mostly redrafts of the maps by Jim Seabrook and Jeff Holliday in 1971 [3]. This map was based on high grade surveys with measured detail and cross-sections. There is much detail missing from the Naked Lady Chamber area in the published map.

The large flowstone wall at the top of Naked Lady Chamber was eventually scaled with the poles during the current survey project. The rift beyond turned out to lead into a stream passage which does not flow back into Naked Lady Chamber, heading north instead. The first trip up into this was led by Keir Vaughan-Taylor in 2005, followed by the eventual survey trip in December 2013.

Ice Pick Lake

Speleological groups certainly knew about Snakes Gut in the early-mid 1950s (See above). SSS launched across Ice Pick Lake on lilos to explore the southern side in 1968 [8][9]. The difficult mud wall on the southern side was scaled with the use of ice picks, and the name stuck. They reported that there wasn't very much at the top of the climb.

In 1984, Pat Larkin and Keir Vaughan-Taylor resolved to attempt the climb once more. They decided to swim across the lake – Pat in a wet suit and Keir in his birthday suit – then put clothes back on for the climb. The clothes were in a large garbage bag which they carried across.

“There is an almost vertical mud slope with a half inch wide ledge to stand on at its base. We had brought four steel pegs to dig in and climb the mud. These extremely useful climbing implements were next to useless. The mud was too gloppy to act as any kind of supports to the pegs. We managed to wedge one peg tightly across a split in the limestone above our heads. This permitted us to haul ourselves out of the water and onto a thin toehold of sharp limestone. While hanging onto the peg and the toehold we tried to locate a feature in the mud /limestone that would take a peg in such a way as to support a certain amount of weight. The thin toehold of limestone fractured and I joined Pat again in the lake.... With persistence we both managed to negotiate two separate routes to the top of the mud bank.....

“We had been concentrating so much on our slippery progress to the top that we failed to notice the unfortunate effect our activities were having on our garbage bag resting on the mud shelf nine inches under the water. Several large boulder like pieces of mud straffed the garbage bag and sent it bubbling to the bottom. Underwater the bottom falls away rapidly and the visibility is nil. Trying to dive for the gear involved blindly running our hands along the mud in search of PVC garbage bag..... I had been without warm clothes for more than an hour now and still had to renegotiate the swim back across the lake. I began to lose interest in following the garbage bag to the bottom of the lake..... Although we fortunately had left reserve clothing on the bank we had no reserve boots. This means we had to barefoot it from there. [10]

It appears that the editor of the Bull has tried to draw a veil of decency over the affair. From discussions with both participants plus independent witnesses, the truth can now be exposed. There were no reserve clothes. Pat exited the cave in his wet underwear and barefoot, and Keir exited the cave altogether in the altogether. Given how cold they both were, they sped out of the cave pausing only to say hello to a group of beginners being led through Railway Tunnel by Graeme Galloway. Outside the entrance they strode boldly up to another group of beginners being led down the valley by Mike Lake – “You'll never guess what happened to us!!”, before getting to Keir's car. Graeme Galloway thoughtfully locked Keir's car for security while he was away, locking Keir's car keys inside. Keir spent half an hour trying to break into his car to put some clothes on.

No trace of the garbage bag was ever found by the divers.

Ian Lewis came up from South Australia to dive at Jenolan a number of times during the late-1970s, and he pioneered some of the more famous dives in the show caves and elsewhere. He was the first person known to dive in Ice Pick Lake, in Easter 1980, and reported diving through large passage to -17 m depth [11]. He also reported turning around because of lack of air, not lack of cave. This intriguing exploration was not followed up by anyone, and became one of the legends of Jenolan.

Driven on by old stories of Ian's dive, SUSS went back to Ice Pick Lake to explore the depths in 1996. Merv Maher and Mark Spencer splashed into the lake and spent a long time not finding a way on – mostly because the inconspicuous hole at the downstream outlet of the lake is not in the obvious location for the continuation of the cave and the visibility rapidly turned to zero. Eventually, they found a hole and pursued it though truly ugly, tight passage. They decided that stories of large passage and -17 m depth were wild caver exaggeration. In fact, they had entered the upstream dive! Which is truly ugly and tight [12]. Rod Obrien eventually sorted out the correct hole, the dive and the dive line. He confirmed Ian Lewis' description and furthermore reached the air chamber. The current survey project was able to use Rod's line without alteration.

World of Mud

David Jackson started it. During a SUSS trip through Naked Lady Chamber early in 1996 he pointed out a lead on the eastern side of the chamber to John Bonwick [13][14][4].

“Mark Staraj and I had been to Naked Lady Chamber in Mammoth and had begun to speculate on possible leads. In my opinion, there is still a lot of work to be done in this area, considering its proximity to the contact and to Ice Pick Lake. I had noticed a rift recessed in the east wall of the small chamber you emerge in after taking the left turn from the micromeander bedrock squeeze. I had tried to climb up the

rift to see what was up the top but failed due to the cruddy nature of the rock. I reasoned that any seepage off the contact would flow on the east side of the rift and might well produce a large portion of cave.

"It was known from the Nibicon conference in 1973 that following the rift north led you to a pitch in Naked Lady Chamber but what about south?.....I asked John Bonwick to join me on the trip. We spent the evening in the Baal Dig but during the day John and I led a party through Naked Lady Chamber and it was then that I expressed my curiosity about this rift and asked whether SSS had looked at it before. They hadn't.

"Some months later, early in 1997, John mentioned to me that Martin Vizjak (SSS) had become interested in this lead and invited me along on an SSS trip to explore it. Other commitments precluded my participation so it was agreed to hold off for a month. The following month I was again asked to join them. This time, however, I was suffering from a cold and when asked whether it was OK for them to look at the lead, in a weak moment, I said yes. Wouldn't you know it? John's response when I spoke to him on Monday was "You really should have been there, Dave." Martin had broken through into new passage. There was such a howling breeze through the narrow squeeze into the new section that small rocks were being thrown into Martin's face! This might explain why that area of cave has always felt cold. It's very damp around there and the air flow would give rise to some evaporative cooling.

"The following trip I asked to join them, but it was a full trip. On this trip a large expanse of new passage was found ending in an impressively large chamber and some very large avens. Finally I was able to join SSS on 3 May 1997."

SSS took the ball passed to them by David and ran with it. They ran hard! Martin Vizjak drove the club to extremes of effort to climb every shale band and inlet aven, including significant aid climbs. They poked themselves through the scary rockpile under Toms Kitchen, and scraped through the wet gravel grovels in the streams at the bottom. The Snowfields were found relatively early in the exploration push trips, and protection barriers were fashioned to limit the damage to the formations from falling debris.

Since that time, no notable extensions have been found in World of Mud, including during the current survey project. It's a testament to the thoroughness with which Martin pushed the project.



Tina Willmore on the entrance pitch of World of Mud. Photo by Paul Lewis

PHYSICAL SETTING

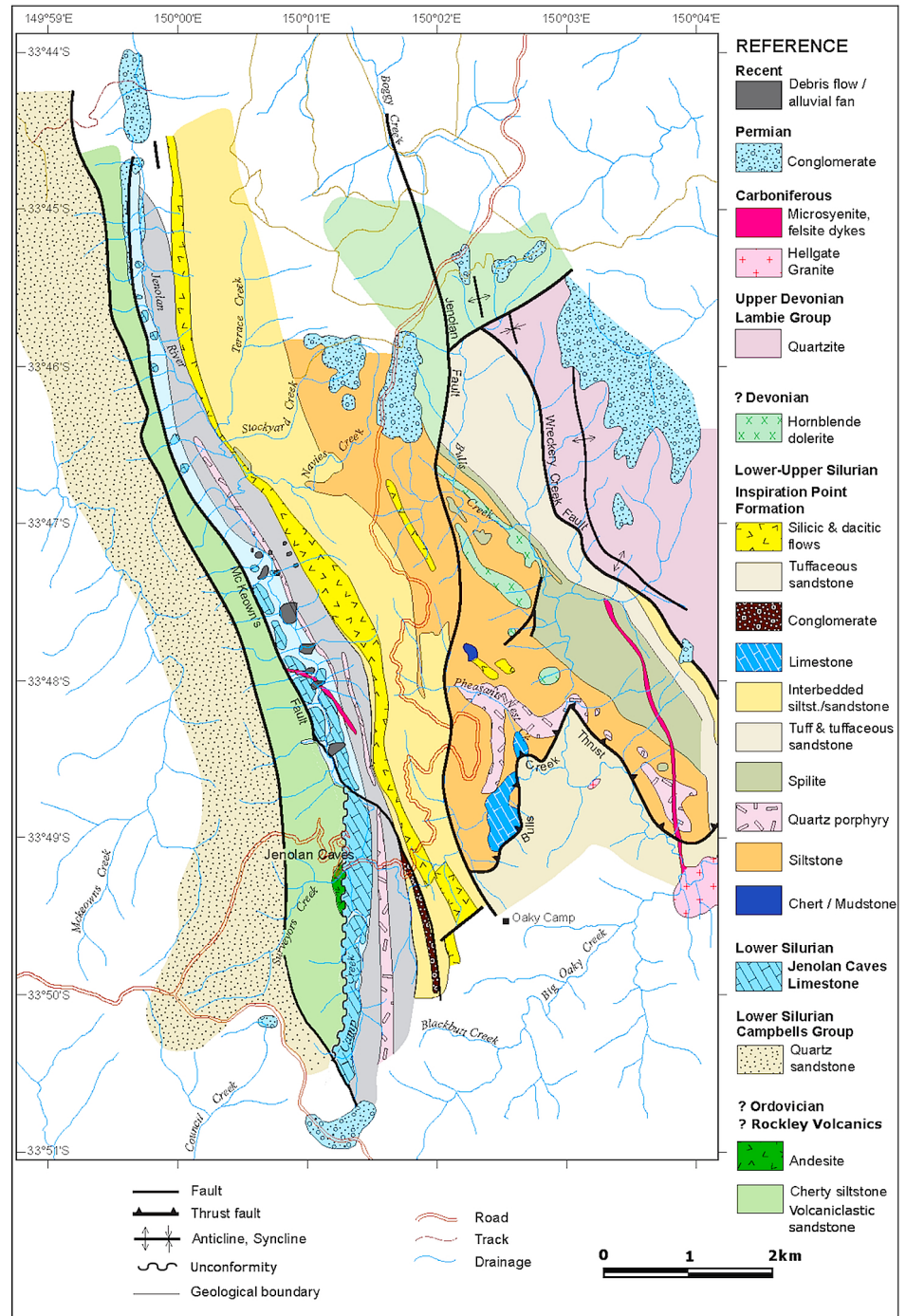
This section of Mammoth Cave lies well to the east of the cave entrance. The eastern contact of the limestone is visible in World of Mud. The area is underlain by the intermittent drainage of Central River, and there are water inlets from the limestone contact to the east, at Naked Lady Chamber and more prominently at World of Mud. The surface of the bluff rises high above the valley floor in this part of the cave, to 150 m above the river at the limestone contact. At World of Mud, the cave passage rises well above the entrance of the cave, one of the few places in the cave where major passage lies higher than the entrance. Ice Pick Lake marks the downstream end of the tight, immature stream passages of Central River, and the start of the substantial underwater phreatic passages that eventually must connect with Lower River in the vicinity of Gargle Chamber.

Geology

The geology of McKeowns valley has been described by Ian Cooper [15][16], based on work by Tony Allen, Armstrong Osborne and Henry Shannon [17][18][19]. In the vicinity of Mammoth cave, the limestone is bounded on the west by McKeowns Fault, which crosses the valley near the entrance of the cave. To the north of the entrance, the valley is in limestone on both sides, while south of the entrance, the limestone lies to the east of the Jenolan River. Mammoth cave lies entirely on the eastern side of the river, in Mammoth Bluff. The bluff rises very steeply out of the valley, reflecting the nearly vertical bedding through the lower end of McKeowns valley.

At the entrance of Mammoth Cave, the limestone is roughly 300 m thick. The Silurian age Jenolan Caves Limestone is highly pure except near the contact with older and younger sediments. The strike of the limestone in Naked Lady Chamber is 350 – 170° grid, while the bedding of the limestone in the Naked Lady / World of Mud area is overturned and steeply dipping (approximately 80°) to the west.

To the east of World of Mud, the younger Devonian shales and mudstones lie conformably under the limestone. Leaching of the manganese and magnesium minerals from these rocks is responsible for the spectacular aragonite deposits in World of Mud. This area of the cave also shows strong corrosion and unstable passages caused by weathered pyrite minerals (acid sulfates). The steel trace of a caving ladder left rigged in World of Mud for three years was able to be pulled apart by hand, indicating acid corrosion. A major shale band runs through Hell Hole and Naked Lady Chamber along strike,



Geology of McKeowns Valley – Cooper (20)

shaping the passage development in this area. As the passages of World of Mud climb higher toward the east, shale bands progressively become more prominent and the limestone becomes less prominent.

There is no evidence of faulting or movement in this section of the cave. Most passages are developed along strike (essentially north-south), with secondary development along joints at right angles to the strike (such as the section of Snakes Gut between the puddle and Naked Lady Chamber junction, or the lower levels of World of Mud).

There is one magmatic intrusion in this part of the cave. Abusive Intrusive is a 0.1 – 0.5 m thick sill consisting of quartz/feldspar/plagioclase minerals, near the beginning of Snakes Gut. The limestone surrounding this intrusion is altered (recrystallised) in a zone up to 0.5 m thick on either side of the sill. Calcite crystals in this area are fist-sized and larger [16]. Cooper suggests this intrusion is related to the Carboniferous granites seen in Hellgate Gorge downstream of Jenolan Caves and in the Megalong Valley.



Aragonite in World of Mud. Photo by Rowena Larkins

Central River / Ice Pick Lake

Central River flows to Central Lake at the downstream end of Middle Bit. From here, a drought survey pursued by Mark Staraj continues 30 m south in increasingly difficult passage to an eventual choke point [4]. The next known location of Central River is a pool to the side of and below Snakes Gut. This overflows into Snakes Gut during flood events. Downstream from the pool, the next known location of Central River is the upstream sump in Ice Pick Lake. From the south side of Ice Pick Lake, the water exits at -4 m into an underwater phreatic tube and heads south. This has been surveyed for 105 m to an air chamber. There is a further 150 – 200 m south to go to reach the Jenolan Underground River below Gargle Chamber. Dye tracing and water chemistry experiments show that Central River joins Lower River downstream of Slug Lake [7][21].

World of Mud

Water enters the higher regions of World of Mud via the contact of the limestone with the Devonian sediments to the East. There is a flow through the rockpile below Toms Kitchen and down the steep passage below that to the horizontal passages at the base of World of Mud. This permanent flow disappears into tight gravel passages in the direction of Naked Lady Chamber and presumably joins Central River at or near Ice Pick Lake.

Naked Lady Chamber

In the scaling pole lead above Naked Lady Chamber, there is a permanent inlet aven at the eastern margin of the cave. This lies on or close to the limestone contact, to the north of World of Mud. The water flows down to the north in the muddy passage, disappearing close to the muddy passages east of the route to Hell Hole. Water from this region appears to flow underneath Railway Tunnel and ultimately into Central River.

Flood events

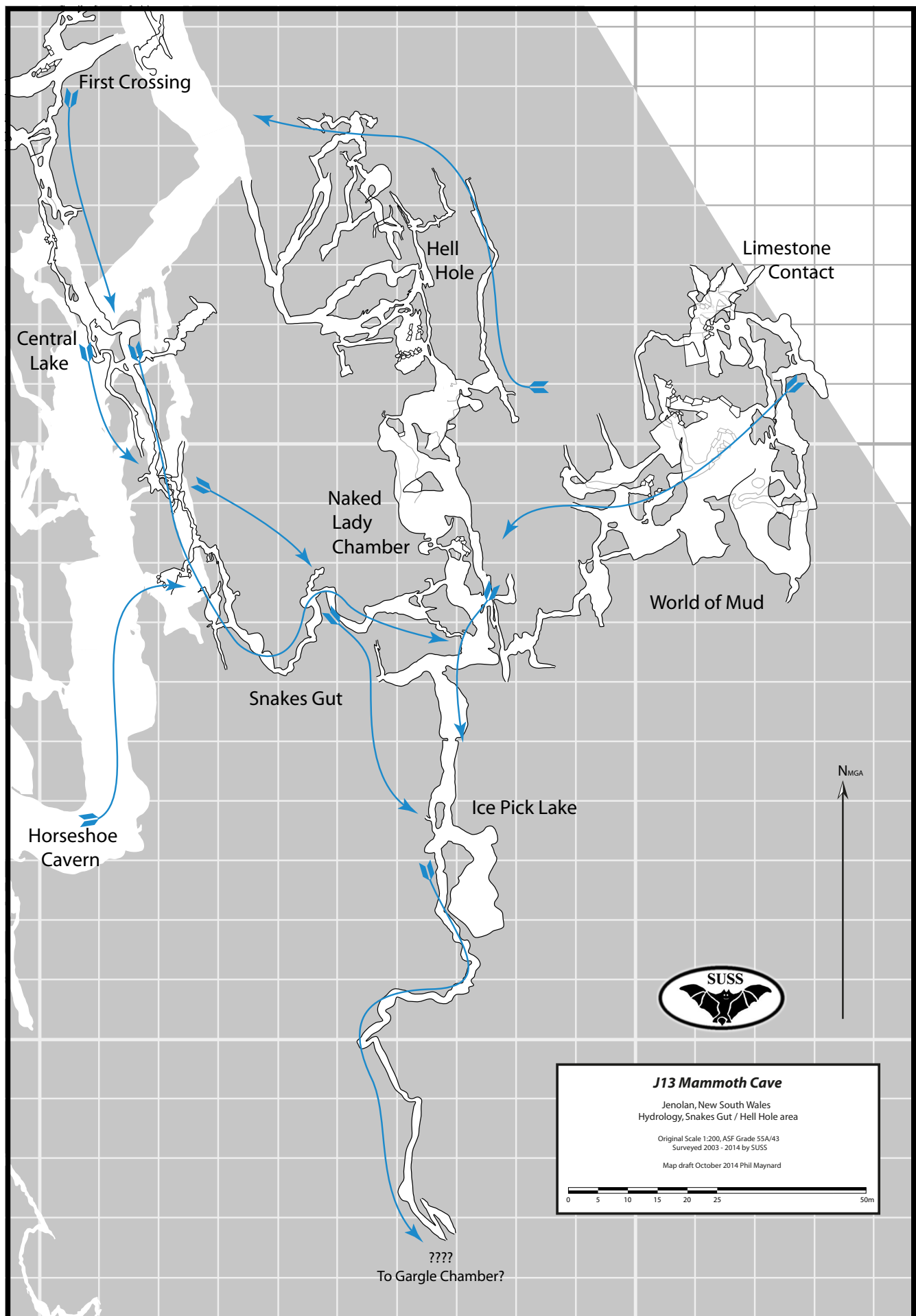
In a major flood, Central Lake rises strongly up into Abusive Intrusive and forms a spectacular waterfall southwards into Snakes Gut [22]. Simultaneously, water rises out of Central River via a pool beside Snakes Gut. During a full flood event, water also pours into Snakes Gut from above at Unsurveyed Connection, ultimately from Sand Passage. Snakes gut has limited capacity through its middle section and the water rapidly backs up at the upstream end. There are impressive foam marks 5 m above the floor in the meanders of upstream Snakes Gut. The downstream end of Snakes Gut rises through tight bedrock squeezes and rockpile into the bottom of Naked Lady Chamber, and during a flood this junction can be a dome of water at least a metre high.

The combined floodwater flows of Central River and Unsurveyed Connection ultimately arrive at Ice Pick Lake. The lake chamber has a substantial volume, but the underwater passage heading south from here is relatively restricted. As a result, flood waters back up impressively at Ice Pick Lake, to ten metres above the normal level.

There is no alternative pathway at Ice Pick Lake for floodwaters to take and the water from flood events eventually drains through the underwater passage to Lower River and Gargle chamber. It is also possible for water from flood events in Lower River to back up into Ice Pick Lake, as there is a direct hydrological connection between the two catchments.



Ice Pick Lake with the dive line. Photo by Paul Lewis



ICE PICK LAKE / NAKED LADY CHAMBER AREA, MAMMOTH CAVE — THE SURVEY

Surveyed length	1753 m
East-West extent	124 m (Central Lake to World of Mud)
North-South extent	188 m (Near Hell Hole to Ice Pick Lake dive)
Vertical extent	109 m (Ice Pick Lake dive to World of Mud above Snowfields)
Dates of survey	2/2/2003 – 10/5/2014
Number of survey trips	21
Number of surveyors	30



Phil Maynard with the dive survey gear, Ice Pick Lake. Photo by Deborah Johnston.

The dry passages were surveyed with Suunto compass and clinometer up until 2010, and with a Leica Disto X subsequently. The Disto X is capable of ASF Grade 6 survey, while the Suuntos give ASF Grade 5 survey in easy terrain when used by an experienced operator. In difficult terrain, the dreaded parallax error makes Grade 5 survey unlikely with a Suunto set. Underwater survey was conducted using a dive computer for depths, Silva compass and 30 m fibreglass tape, to ASF Grade 4.

Surveyed on more than five trips: Ian Cooper, Philip Maynard.

Surveyed on up to five trips: Four trips Alex Boulton.

Three trips Simon Goddard

Two trips Katrina Badiola, Rob Jones, Steve Kennedy, Max Midlen, Rod Obrien, Mark Staraj, Jack Wachsmann, Thomas Wilson

One trip Tom Begic, Nat Brennan, Mark Euston, Rick Grundy, Deborah Johnston, Bill Lamb, Mike Lake, Rowena Larkins, David Lee, Mark Lawson, Scott Miller, Chris Norton, Felix Ossig-Bonanno, Alan Pryke, J. Thompson, Steve Tidman, Keir Vaughan-Taylor, Tina Willmore

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- [2] Phil Maynard, "Railway Tunnel Area, Mammoth Cave", SUSS Bull 52(3), 15–51, 2013.
- [3] John Dunkley (ed), *The Exploration and Speleogeography of Mammoth Cave, Jenolan*, 1971.
- [4] Mark Staraj, "Mammoth Erotica", SUSS Bull 43(4), 14–22, 2004.
- [5] J.J. Foster, *The Jenolan Caves*, 1890.
- [6] Henry Fairlie-Cuninghame, "Jenolan. May 23rd – 26th, 1952", SUSS Journal 1(3), 3, 1953.
- [7] Denis Burke, "Fluorescein and Water Tracing", SUSS Journal 2(2), 19–22, 1955.
- [8] K Booth, "TR 13-14/1/68", Stop Press 12(2), 22–23, 1968.
- [9] Eric Halbert, "TR 25-26/5/69", Stop Press 13(6), 85, 1969.
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- [20] Ian Cooper 2015, Updated from [15].
- [21] Julia James and Malcolm Handel, "A Chemical Investigation of some Groundwater of the Northern Limestone at Jenolan Caves", *Helictite* 15(1), 29–38, 1977.
- [22] Mark Staraj, "Flood!", SUSS Bull 33(2), 29–32, 1993.

PICTURE GALLERY



World Of Mud, Mammoth, Jenolan. Photo by Paul Lewis.



Phil Manyard looks down a climb, World of Mud, Mammoth, Jenolan. Photo by Paul Lewis.

THINGS TO BUY

For postage and handling costs and the details of how to order go to the SUSS website <http://ee.usyd.edu.au/suss/> and click on "Publications". There you will also find a range of must-have maps and other publications.

Maps and Bulls on DVD

The entire SUSS cave map library of over 300 maps is on DVD and available for purchase. Our map library was scanned to provide wider access to the maps for SUSS and other ASF Caving Clubs and to ensure that many copies exist in the event of the loss or damage of the originals.

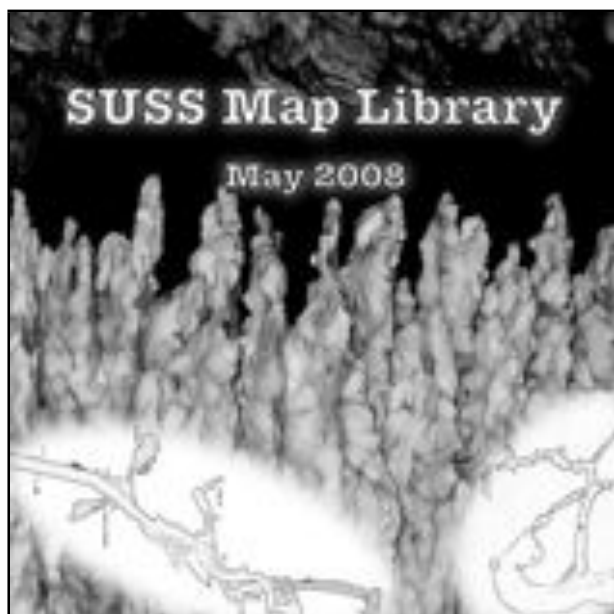
There are field sketches, ink maps produced on drafting film, ink maps produced on linen, as well as some of the latest digitally-produced cave projects. The DVD also contains all SUSS Bulls in HTML format from 35(1), July 1995 to 47(4), March 2008 and SUSS Bulls as PDF format from 42(1), April 2002 to 47(4).

Price is \$10.00 + PH. Pick one up at the next SUSS meeting or if you can't make that then contact the treasurer and they can supply you with the SUSS publications fund bank BSB and account number for a direct deposit.

Tuglow Caves

By Ian Cooper, Martin Scott and Keir Vaughan-Taylor. 1998, 70 pages.

Examines caving procedures, site descriptions, history, biology, surveying and maps, geology and hydrology of Tuglow Cave and others. Cost is \$13 for members and \$16 for non-members + PH.



A must-have reference DVD for all cavers



The Caves of Jenolan, 2: The Northern Limestone

Edited by Bruce R. Welch. 1976, 140 pages.

We still have some copies of these books left. Contains maps and descriptions of many caves in the Northern Limestone section of Jenolan plus notes on the history of Jenolan and its geology, geomorphology and hydrology. Cost is \$8 for members and \$10 for non-members + PH.

TRIP LIST: MAY 2015

SUSS General Meetings are held on the first Thursday of the month at 7:00pm (for a 7.30pm start) in the Common Room in the Holme Building at the University of Sydney.

For updates to this list, check out the SUSS Website: <http://suss.caves.org.au>. Detailed information on each caving area (plus other useful information such as what you will need to bring) can be found in the *Beginner's Handbook* section of the Website.

Please Note: it is YOUR responsibility to inform the trip supervisor of any relevant medical conditions which may in any way affect your fitness, such as asthma, diabetes and the like.

Mar

7–8 Bungonia. Introduction to caving, especially for new O-Week members. Contact Tabitha: tabscaves@gmail.com

14–15 Jenolan. Our regular haunt. Stay at the luxurious cavers cottage. Contact Max: mmidlen@gmail.com

21–22 Cliefden. Beautiful caves out west. We're trying to show why they shouldn't be flooded by a dam proposal. Contact Phil: Philip.Maynard@uts.edu.au

21–22 Wombeyan. NOTE NSW Election, remember to postal vote or prepoll. Contact Jack: jack.wachsmann@gmail.com

Apr

3–6 Yarrangobilly. Fabulous caving down in Kosciusko. Take the long weekend opportunity to see this slightly more distant caving area. Contact Deb: birinxi@gmail.com

9 General Meeting Learn about the Western Australian Karst. See more details closer to the date. Presenter Alan Pryke.

11–12 Jenolan. Come for the platypus, stay for the caves. Contact Denis: dstojanovic91@gmail.com

18 BBQ. There may be a gear audit at the same time. Contact Denis: dstojanovic91@gmail.com

26 Abseil trip. Learn the ropes. Contact Jack: jack.wachsmann@gmail.com

May

2–3. Wombeyan. Camping in the southern highlands, sitting around an open fire after a day caving. Contact: (see closer to the date for information).

9 AGM. 7.30pm, Reading Room Holme Building. Come along to hear what your club's been doing all year, and replace the old committee with shiny new committee Contact Dennis: dstojanovic91@gmail.com

9–10 TBD. See the web site closer to the date.

16–17 Jenolan. Fun in the mountains as you enjoy relaxing by the fireside. Contact: (see the web site closer to the date).

23–24 TBD. See the web site closer to the date.

30–31 TBD. See the web site closer to the date.
