SPELEO SPIEL

NEWSLETTER OF THE TASMANIAN CAVERNEERING CLUB, Inc.

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CONTENTS

FORWARD PROGRAM 1
EDITORIAL 2
IDA BAY ISSUES 2
IDA BAY - MODIFIED MINING PLAN & EMP GUIDELINES 3
BENDERS QUARRY: Some questions and answers 6
Tackling the BIG PITCH in Niggly Cave 9
NIGGLY CAVE - sherpa trip 10
LATE NEWS 10

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FORWARD PROGRAM

Late December: Christmas and New Year things.... Several visiting speleo's will be in the State during this period so there may well be some activity originating from those people. Talk to Dean or Trevor about it!

December 16, 1990: The Ida Bay ENVIRONMENTAL MANAGEMENT PLAN should be available... for 6 weeks of public scrutiny. Get one - read it and be certain to respond in a suitably negative manner.

Late February or early March: Another of those S&R exercises - this time probably in the Junee Florentine area... From what was learned last summer in Big Tree Pot, much more can and will be made of this exercise. Talk to Stu Nicholas about this one. A definite date will be set soon (after inspection of a couple of possible suitable caves by the protagonists).

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EDITORIAL

Last month, some mention was made of pending conservation problems at Ida Bay. Well, this issue of the Speleo Spiel contains three articles / notes on the present situation at Ida Bay. Please read the articles, digest them and write to the politicians (names and addresses are in the articles) and the management of EZ in order to provide some more weight to the effort to stop the destruction of more of the world... **THE MATTER IS URGENT!!**

Stuart Nicholas

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IDA BAY ISSUES

"The Department of Parks, Wildlife and Heritage has supervised studies to investigate the impact of limestone quarrying at Ida Bay on geomorphology, hydrology, palaeontology, botany, zoology and archaeology. The visual and recreational impacts of quarrying operations have also been investigated. The general conclusion from these studies was that **if the natural values associated with the karst system are to be maintained, expansion beyond the current quarry confines should not occur**."

The above statement appeared in the document Tasmanian Wilderness World Heritage Area: Draft Resources & Issues which was released by the Department of Parks, Wildlife and Heritage in mid 1991. Despite the fact that the results of the studies referred to have been available for more than twelve months, a decision in favour of an expanded quarry including the area south of the Marble Hill - Lune Sugarloaf divide, remains a possible outcome of negotiation that are currently under way.

The following values are identified by the studies as threatened by an expanded quarry:

* Exit Cave - the existence of a hydrological link between National Gallery Cave (275 metres from the proposed quarry extension limits) and Exit Cave suggests that the area within the proposed quarry extension is also part of Exit Cave's catchment. Maintaining this area in an undisturbed state is essential if impacts to the Exit Cave system are to be avoided.

* Polygonal karst - closely packed doline fields are usually associated with tropical karst terrains. The small area of polygonal karst that occurs at Ida Bay is therefore unusual and interesting, but is likely to be destroyed if quarrying proceeds further south.

* Palaeokarst - what are possibly the most ancient palaeokarst features known in Australia are exposed within the confines of the present quarry. These are likely to be lost as a result of further quarrying.

* Thylacine fossils - these are located in a cave that would be removed by any southward expansion of the quarry. Other nearby caves contain fossil accumulations formed over the period from about 400 to 12000 years ago.

* Flora - quarrying operations are likely to adversely affect communities of the rare plant species Trochocarpa disticha which occurs close to the quarry.

* Cave fauna - the area contains a rich and diverse assemblage of invertebrate cave fauna, including several species which occur only in the caves at Ida Bay.

* Recreational caving - excellent sporting caves such as the 130 metre deep Little Grunt are likely to be destroyed by an expanded quarry. The opportunity to

discover and explore other caves that certainly exist in the area would also be lost by an enlarged quarry.

* Scenic values - an expanded quarry would have a significantly greater visual impact than that resulting from the present quarry.

If you believe that the continued operation and possible expansion of a major limestone quarry at Ida Bay is totally inconsistent with Ida bay's World Heritage Area status, that the cost in terms of the destruction of a range of important karst features and other natural values is too great, and the risk to the integrity of the Exit Cave system is unacceptable, please write to the following politicians urging them that the only responsible course of action is to scale down and ultimately stop limestone quarrying at Ida Bay. The future of the quarry will be decided over the next few months, so write now if you wish to influence the nature of the decision.

The Hon. M. Field
Premier
GPO Box 123B
Hobart
Tasmania 7001.

The Hon. H. Holgate MHA
Minister for Parks, Wildlife & Heritage
State Offices Building
10 Murray Street
Hobart
Tasmania 7000.

The Hon. M.W. Weldon MHA
Minister for Resources & Energy
State Offices Building
10 Murray Street
Tasmania 7000.

The Hon. R. Kelly
Minister for the Arts, Sport, the Environment, Tourism & Territories
Parliament House
Canberra
A.C.T. 2600.

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IDA BAY - MODIFIED MINING PLAN & EMP GUIDELINES...

Mining Plan

The modified mining plan takes in some of the considerations of caving / speleological fraternity - mining south around (or to one side of) March Fly Pot - within 10 metres - and across eastern spur (or ridge) of Marble Hill (ostensibly uphill from saddle). There is a suggestion of not mining directly through low part of saddle but above it! Extension is still going south of the Marble Hill / Lune Sugarloaf divide. The Plan will destroy IB-211 (Trackcutters Cave) - one of several breeding caves for wetas and the Tasmanian Cave Spider (*Hickmania troglodytes*). Mining plan not specifically shown to cavers, because Mines Department is against the idea od cavers being briefed about the mining plan. Extension will be 50 metres (plus) from the top car park and therefore into catchment for National Gallery , Little Grunt, March Fly Pot and the Potholes Region of polygonal karst.

BUT: Quarry already has impact on karst including a presumed impact on Exit Cave.

Extended quarry provides a staging point for further expansion in karst and towards Exit Cave as well as expanding operation in a World Heritage Area.

Does not address problem of karst destruction or damage to caves, speleothems or other deposit (fossil thylacine, etc.) from blast / shock waves.

There is an inference that quarry expansion is above water table => no impact. But karst aquifer may be seasonal and without a regular water table! There is also an inference that quarry extension will be above the area of palaeokarst.

Quarry expansion will involve surface disturbance of overburden and clays by heavy machinery.. It is virtually impossible to avoid effects of siltation or blockage of solution openings even if the operations are only done in dry weather.

Environmental Management Plan (EMP)

The EMP is due back to the Department of Environment and Planning (E & P) by November 16.

The Government decision on the quarry expansion will be based on the EMP and level (magnitude) of impact determined by hydrological study. Hydrological study by DMMR using six inch diameter boreholes is suspect. One hole broke into cave at -24 metres; one down to -200 metres without water contact; another aborted - water at -28 metres below quarry floor.

PWH are only just starting their hydrological study - Ian Houshold (the new PWH Karst Officer) only began work on November 4..!

EMP: Draft guidelines have input from PWH Officers. Final guidelines (presently being use) differ considerably from the original guidelines;

For example:

For Quarry development plan, no consideration is now given to vegetation, topography, watercourses, underground flow directions, known cave sites or karst system.

Omits reference to investigation of alternate sites for stormwater disposal - away from Bradley Chesterman Cave - ie Bradley Chesterman is still to be used as a quarry drain, but with water treatment / water interception first!

Omits reference to the problem of water / effluent sinking into karst at Weighbridge Sink and upstream (upslope).

No assessment of water quality for stormwater / effluent sinking into karst.

Visuals - no concern for appearance of quarry during future development or at completion of operation;
- omits consideration of further detrimental impact on World Heritage Area.

Impact of blasting on karst omitted from EMP. No monitoring of "blast induced ground vibration" as previously requested. Also, no monitoring of blasting impact on water quality, flow regime, present hydrology or palaeontology.

No monitoring of turbidity and water quality in Bradley Chesterman Cave or Exit Cave or caves adjacent to area south of quarry. Suggestion that pollution impact due to siltation or movement of clay flocculate not as significant (or as much of a problem) as pollution impact from oil products or other hydrocarbons.

No monitoring of disturbances due to blasting or water runoff.

No insistence re detail of effect or impact on specified caves such as March Fly Pot.

Monitoring - technique amended and effectively weakened from draft - originally "monitoring the Exit Cave system and other cave systems for any adverse impact of quarrying operations (eg hydrology, fauna)", now reads "periodic inspection of nearby caves to monitor effects of quarry development." There is a suggestion that cave monitoring be left to cavers (not E&P staff).

Rehabilitation - Instead of using soil and overburden above impermeable plastic on old benches, EMP allows for clay from solution cavities and clay dumps with use of some fertilisers (depending on PWH concerns re nutrient enrichment of karst).

Pluses - Disposal methods for domestic and industrial rubbish to be outlined. Any rubbish dumped in karst features to be systematically removed. Weighbridge Sink includes fissure cave in doline filled with old oil drums, industrial rubbish and waste oil with a covering of crushed limestone. Alternative sites to be found for clay dumps presently stored at north west and south west corners.

Quarry extension will effectively mine through the area of access (including Skinner Track), denying access to caves and karst or recreational or speleological sites in vicinity of quarry as well as Exit Cave.

E.g., Quarry extension will almost reach Comet Pot and Giotto Pot. March Fly Pot will be perched on a side wall of new quarry extension (access by Sky Hooks??).

Amended "License to Operate" (August 1989) has been breached on many occasions.

Problems - there are no persons in E&P with karst expertise.
- E&P give Bender advanced warning (10 days) prior to inspection.
- Only two or three known inspections have occurred during this time.

BREACHES:

-Quarry to report any solution cavities opened up - at least three major cavities of approximately 1 metre diameter plus have not been reported, simply filled in or covered over.

-Waste oil to be removed to a site outside karst. Not done, merely buried by finely crushed limestone.

-Rubbish removal - some removed but most just buried in trenches, particularly in area of Weighbridge Sink and old Ida Bay tramway area near weighbridge.

-Effect of blasting on caves - no monitoring devices set up in caves.

Arthur Clarke

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CONTACT FOR EMP COPIES:

Dr J. McCambridge, phone 002 302652, or B. Chesterman 002 306504. Request an extension of time for submissions. Six weeks over the Christmas period is not long enough. Send submissions against the EMP to Department of Environment and Planning and letters to Paul Salmon, Chairman, Pasminco-EZ, Risdon, Tasmania, plus Bob Hawke (or whoever is PM when you read this!) to editors of newspapers, politicians and anyone else you can think of!

BENDERS QUARRY:

(A) Some questions and answers

Why is the quarry in a World Heritage Area ?

The quarry is located in an area of limestone along with EXIT CAVE and another 170 known caves which are all within State Forest. The whole area came under scrutiny during the Helsham Inquiry into the Lemonthyme and Southern Forests. Exit Cave was one of several sites recommended for World Heritage listing. (EXIT CAVE IS PART OF A MAJOR UNDERGROUND DRAINAGE SYSTEM IN THE LIMESTONE OF THE IDA BAY KARST.) In order to maintain the integrity of Exit Cave and the karst processes contributing to its formation and function, it was deemed essential to protect the surrounding (or contributing) limestone karst and its catchment. The surrounding limestone includes the present Benders Quarry operation.

How close is Exit Cave ?

Benders Quarry is less than 800 metres from mapped passages of Exit Cave. Some known but unmapped passages extend a further 100 metres towards the quarry. A recent hydrological survey in the limestone karst indicated a positive connection to Exit Cave from a well known swallet located barely 100 metres south of the quarry. This vertical cave is one of a number of cave entrances and inflow sites that lie in a direct line from the quarry to Exit Cave. Recent exploration has revealed over 2 km of cave passage extending from the southeast corner of the existing quarry towards Exit Cave.

What are the impacts of continued limestone quarrying on the caves (and karst)?

Some of the immediate impacts include:

- the destruction of caves,
- irreparable damage to ancient cave formations,
- damage to fossil deposits (including thylacines and extinct megafauna),
- fracturing of karst aquifers and altered flow regimes,
- blockage of solution cavities and disruption of underground flow due to disturbance of surface soils or the clayey cave fills,
- possible diversion of underground drainage and "drying out" effect on caves,
- direct pollution of conduits and karst drainage by siltation or petroleum products,
- destruction or loss of cave fauna from damage, pollution or disturbance to underground ecosystems,
- loss of valuable speleological research sites and recreational opportunities, and
- visual impacts... the quarry can be seen from Adamsons Peak and Moonlight Ridge.

What is karst ?

Karst is a term used to describe landforms such as caves, potholes or natural arches which are formed in carbonate rocks such as limestone. Carbonate rock is slowly dissolved over a long period of time by the seepage of natural waters which have become slightly acidic due to absorption of carbon dioxide: some from the air, but mostly from the soil. The solution activity forms a myriad of honeycombed underground voids or cavities and channels which may form humanly enterable cave systems or minute fissures barely wide enough for the movement of the tiny subterranean cave fauna. [Most of these invertebrate animals are completely adapted to subterranean life in these dark, moist and stable cave environments and some species are totally blind (no eyes)]. Some of the dissolved carbonate is re-deposited in the solution cavities as calcite cave formations, e.g. stalactites, stalagmites, columns or

flowstone. Karst landscapes typically include dolines (steep-sided, funnel shaped depressions), large fissures or surface openings (cave entrances) which may lead to vertical shafts that act as collection sites for surface debris or natural pitfall traps for surface animals, particularly mammals. Some caves contain rich deposits of fossils from past (extinct) and present day species.

(B) Recommended minimum protection requirements for caves & karst
(for the maintenance of karst processes, karst ecosystems and the subterranean cave biota).

The protection parameters for caves or karst areas are designed to safeguard the significant on-going geomorphic and evolutionary processes which are uniquely characteristic to karst areas and their subterranean biota. To ensure adequate protection, disturbances to surface soils and vegetation and sub-surface rock strata must be precluded from designated buffer zones. Amongst the requirements given in Forestry Commission guidelines and submissions to the Helsham Inquiry, it is recommended that buffer zones in the karst catchment around major cave entrances extend at least 1km (1,000 metres) beyond the known upper reaches of carbonate rock areas or alternately, karst area boundaries should extend to surface divides or ridgelines beyond the karst, which ever is the greater distance. Where catchment streams drain into karst areas, the buffer zone should extend to 2km (2,000 metres).

(C) Fact summary for the World Heritage karst at Ida Bay (Lune River)

1. Exit Cave and Mystery Creek (Entrance) Cave discovered by timber loggers in the 1880-1890's. Both caves form part of a major network of underground channels draining waters from both sides of Marble Hill (Caves Hill) into the D'Entrecasteaux River, which flows through part of Exit Cave. Their magnificent qualities and tourist potential were detailed in an article on the QUEENS CAVES AT IDA BAY reported in the *Tasmanian Mail* in 1891. A subsequent report described the magnificent glowworm displays of the IDA BAY CAVES appears in *Scientific American* in 1895. Cavers commenced their exploration of the Ida Bay karst, particularly Exit Cave, in 1947. EXIT CAVE contains well over 20km of explored passages, some still unmapped, and is the longest completely underground cave system in Australia.

2. The whole area of Ida Bay karst is contained within an area of State Forest, proclaimed in 1937. Exit Cave partially protected by State Reserve, gazetted in 1979.

3. During the 1987/'88 Helsham Inquiry into the Lemonthyme and Southern Forests, the EXIT CAVE system was acknowledged as a site of World Heritage significance. The surrounding karst and its catchment was recognised as having a contributing influence to this World Heritage site with much of the karst essentially forming part of the Exit Cave system. In order to maintain the integrity of Exit Cave and the operating karst processes, the whole Ida Bay karst area (including BENDERS QUARRY) was nominated for inclusion in the extended World Heritage Area which was listed in November 1989. The Ida Bay karst was the only area recommended by Helsham for WHA status purely on the basis of its significance as a karst area.

4. Following WHA listing, the Ida Bay karst became part of the extended Southwest National Park (proclaimed in June 1990), surrounding a 77 hectare resource use area: the Marble Hill Conservation Area which incorporates the Benders Quarry operation.

5. Prior to WHA listing, an increasing incidence of flyrock from quarry activities was noticed south of the Marble Hill/ Lune Sugarloaf saddle, especially near March Fly Pot, a cave site with mammalian skeletal remains including several thylacines. Earthmoving equipment began operating south of the saddle. A massive mudslide soon developed from a waste dump. It cut a wide swathe through the rain forest engulfing the walking track to EXIT CAVE and threatening other caves including Little Grunt (a

130m deep vertical cave). Following a wave of public protest, a moratorium on quarry expansion was announced and the quarry was confined to its present area, north of the saddle. The caving community specifically stated that mining must not broach the Marble Hill/ Lune Sugarloaf saddle, recommending that the operation be either scaled down or relocated. Some conservation groups called for an immediate closure of the quarry.

6. Under the terms of the Commonwealth/ State agreement in November 1988, it was stated that mining "...can continue provided that acceptable limits are set to the scale and development of the operation".

7. The defined boundary for the "temporary limits" to limestone quarrying under the terms of the moratorium coincided with or exceeded the "acceptable limits" recommended by karst experts. The State Government announced their intention to conduct a number of studies to examine the impact of quarrying and limestone extraction on the entire karst system and investigate alternate limestone sources before a final decision is made regarding the quarry's future. Most studies were limited to areas adjacent to the quarry; the hydrologic/ geomorphic studies included all the Ida Bay karst.

8. Following are some of the major aspects of the IDA BAY KARST STUDY reports from Parks, Wildlife and Heritage (PWH) and the Division of Mines and Mineral Resources (DMMR).

- the area south of the quarry is composed of polygonal karst, a form of karst with closely packed doline fields and uvalas, rarely found outside tropical regions;
- a direct hydrological link from National Gallery into Eastern Passage of EXIT CAVE. National Gallery is a "swallet" cave 275m southwest of the quarry; mapped passages in Exit Cave less than 500m from this swallet; known but unmapped passages possibly within 400m. [Subsequently, a closer more direct link to Eastern Passage has been established from Little Grunt, a cave within 100 metres of the quarry.]
- Surface mapping indicates this swallet is one of a number of similar inflow caves and other karst features following structural orientation from quarry to Exit Cave.
- The Eastern Passage has been recognised as the principal genetic axis for the southern part of Exit Cave and therefore is some of the oldest part of the cave.
- Absence of efflux springs south of the quarry and high levels of calcium carbonate in eastern tributaries of Exit Cave suggesting long distance source of waters from eastern extremities of limestone near present quarry;
- presence of turbid (muddied) waters in Eastern Passage (of Exit Cave) after periods of heavy rain; suggested source as runoff from the present quarry.
- Stated assumption re hydrological connection from Benders Quarry to Exit Cave.
- Pollution in Bradley-Chesterman Cave: one metre deep mud and silt, evidence of hydrocarbons and a dearth of aquatic cave fauna due to effects of quarry operations.
- Presence of palaeokarst features in the present quarry, possibly early Devonian age and therefore some of the most ancient geological examples of karst in Australia.
- Internationally significant deposit of fossil thylacine material in March Fly Pot, only metres south of present quarry; also remains of large wombat and the extinct *Sthenurus* (a macropod of the Pleistocene fauna); isolated aboriginal stone tool artefact found in this cave deposit along with charcoal and other skeletal remains.
- One of two most diverse assemblages of troglomorphic invertebrate cave fauna in cool temperate Australia; 12 species classified under IUCN guidelines as rare.
- Cave fauna south of quarry similar to species in Exit Cave suggesting mobility of fauna through subterranean biosphere and supporting concept of karst connectivity.
- Rare plant species: *Trochocarpa disticha* (an epacrid heath) on SW edge of quarry.
- Study of blasting practices reveals that ground shock waves already have a damaging effect on speleothems (stalactites, flowstone etc.) in caves south of the quarry; suggested likelihood of damage to cave formation in Exit Cave from earlier quarrying.

- Favourable DMMR report of high grade (95-96% $CaCO_3$) reserves in limestone area near Maydena; report apparently not forwarded to Government for consideration.

9. THE PRESENT SCENARIO: Pasminco E-Z request for high grade (94% $CaCO_3$) limestone to increase production efficiency and reduce jarosite (a toxic waste product largely composed of the insoluble part of limestone). Comment re availability of high grade limestone from Railton and even higher grades (98-99%) from overseas. BHP already imports limestone from Asia (e.g., Japan) and it has been suggested that this could be landed in Hobart @ $8.00 per tonne cheaper than Lune River. (No expected job losses due to availability of Federal monies for rehabilitation of World Heritage Areas. Despite the Tasmanian ALP's policy of no expansion, location of alternate source and quarry wind-down, Premier Field has reportedly assured Bender that "all effort is being made for a continuation of the quarry". Mining plan already prepared for a southern extension of the quarry into cave systems with proven drainage into Exit Cave. Additional hydrological study requested. Environmental Management Plan (EMP) for this southern extension due mid-December 1991. Serious doubts expressed about EMP because guidelines considerably modified (weakened) from original draft, omitting reference to numerous impacts including damage or pollution of caves in the WHA, stormwater runoff, water quality in Exit Cave or adequate monitoring procedures. Quarry operator expects to start extended operations late January / early February 1992.

Arthur Clarke

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Tackling the BIG PITCH in Niggly Cave **2 June 1991**
Party: Nick Hume and Dean Morgan

A call to Nick Hume on Friday night indicated that he wasn't very keen until it was explained that the rope was already in the cave and it was only a matter of rigging the small pitches above the BIG PITCH. Then he said he couldn't refuse being on the first descent trip!

We had an overnight permit so there was no need to rush to get out which made the show much more enjoyable. When finally at the top of the BIG PITCH, an almost perfect rigging point was found by traversing around the top of the drop into a large chamber. Nick placed a bolt in the wall and tied the rope back to a boulder on the floor. I then descended 7 metres to where a rebelay was needed as there was a slight rub point. No natural anchor points were in existence, so I prusiked up again to enable Nick to go down and place another bolt. This was placed on the nose of a very large rock. Future parties should note that this bolt needs a short sling or two karabiners to hang the knot free of the rock. From there the rope disappeared into the black void below. I then headed into the same void! The rope hangs at least 6 metres away from anything all the way down and is one of the most impressive pitches I have ever been on. [Ed. note - Is that an understatement, or what??] On the descent there was one 50 metre section where there was quite a bit of water spraying onto me, but strangely it wasn't there on the return. Perhaps it was Nick relieving himself above me!

I had expected to land near the top of the 15 metre pitch at the bottom of the cave, but instead landed at the bottom of this pitch. The 15 metre rope I had with me for this pitch was needed instead to tie to the main rope in order that the end didn't disappear when I unclipped from it... Our brand new TCC rope only just touched down!

Interestingly, our footprints from the bottoming trip (when we came down the other way) last year weren't visible so the cave must have flooded since that time. All that was left was the long prusik out. It wasn't as bad as I thought it would be and I eventually arrived at the top of the pitch to find Nick still there waiting

for me. I also found the end of the rope caught around my pack - this explained why the prusik seemed to be getting harder the further I ascended. After some discussion we decided that the pitch was about 190 metres long and one of the longest in the southern hemisphere - its certainly the best in Oz.

Everything was left rigged before we casually made our way out since there will undoubtedly be another trip in the near future. Once again the entrance ladders were pulled out to avoid corrosion problems. Many thanks to Nick for coming along and helping with bolt placement.

Dean Morgan

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Niggly Cave - sherpa trip **24 May 1991**
Party: Volker Surisd, Simon Morgan (a bit) and Dean Morgan.

I had been trying unsuccessfully to convince people all week to help me take the ropes into Niggly Cave in preparation for the assault on the big pitch. No one was even remotely interested so I pulled Simon out of retirement and talked Volker into the trip by telling him a lot of lies... (easy walk to the entrance, easy stroll through the cave, heaps of fantastic formation... etc.!). The only mistake I made was indicating that **I** would take the 200 metre rope.

The new rope was tangled on the spool so the three of us spent something an hour with the rope spread all over the Florentine Road like a giant squid untangling it. Of course this was done in the rain on the wet road so the rope wasn't really light when packed into my pack (yes, I know I should have done it the night before...).

The next hour was spent struggling up the hill to the cave and once there, Simon decided that he had had enough. His ropes were stuffed into Volker's pack. We then struggled our way through the entrance series to the top of the 85 metre pitch. It was unanimously decided that we wouldn't take the ropes along the rift to the top of the new pitch as my knuckles were already dragging on the floor from the weight of the pack.

The trip out seemed exceptionally easy. The ladders were taken out in case the push trip didn't happen for a while. Many thanks to Volker for not hitting me when he found out what the cave was really like! I think I even heard him say he enjoyed himself...

Dean Morgan

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LATE NEWS....

LITTLE GRUNT, a cave barely 100 metres from the top of the existing quarry at Ida Bay has produced a positive dye trace to the Eastern Passage in Exit Cave... The transit time was less than 48 hours (probably much less as it was detected following sampling after this time) and the dye used was Rhodamine WT (the low toxicity version). The dye trace result prompted some exploratory work in Little Grunt. Hence, almost 2.5 km of active and fossil stream passage was recently found and mapped, including a side branch extending well north of the surface divide and under the present quarry workings.

ALSO, fluorescein dye placed into two locations (eastern and western ends) in the existing quarry. This dye has been traced to both Exit Cave and Bradley Chesterman Cave. The locations used to input the dye were on the bench level above the rock pile, ie above ASF Pot (the exposed hole in the face of the quarry).

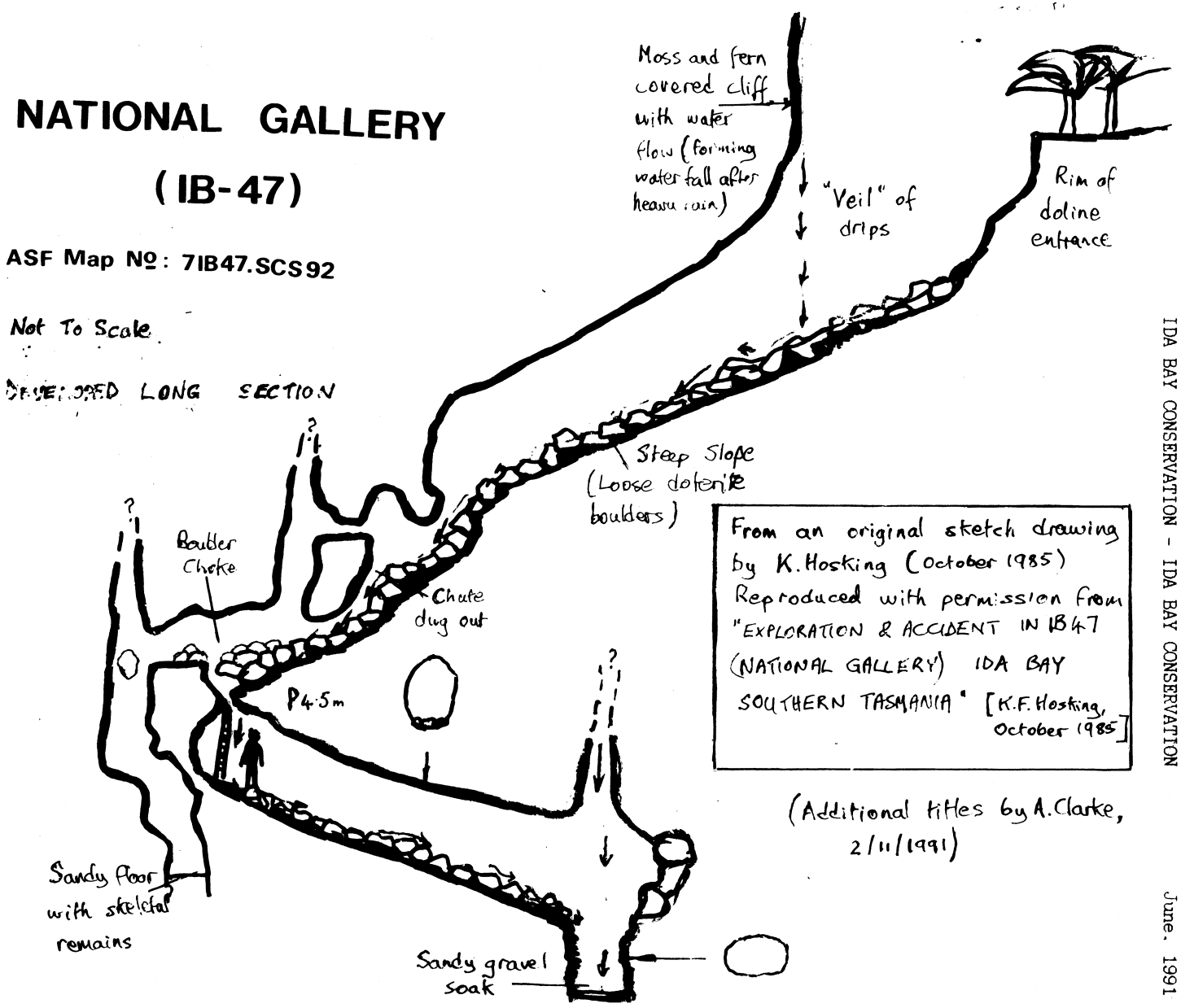
NATIONAL GALLERY

(IB-47)

ASF Map Nº: 7IB47.SCS92

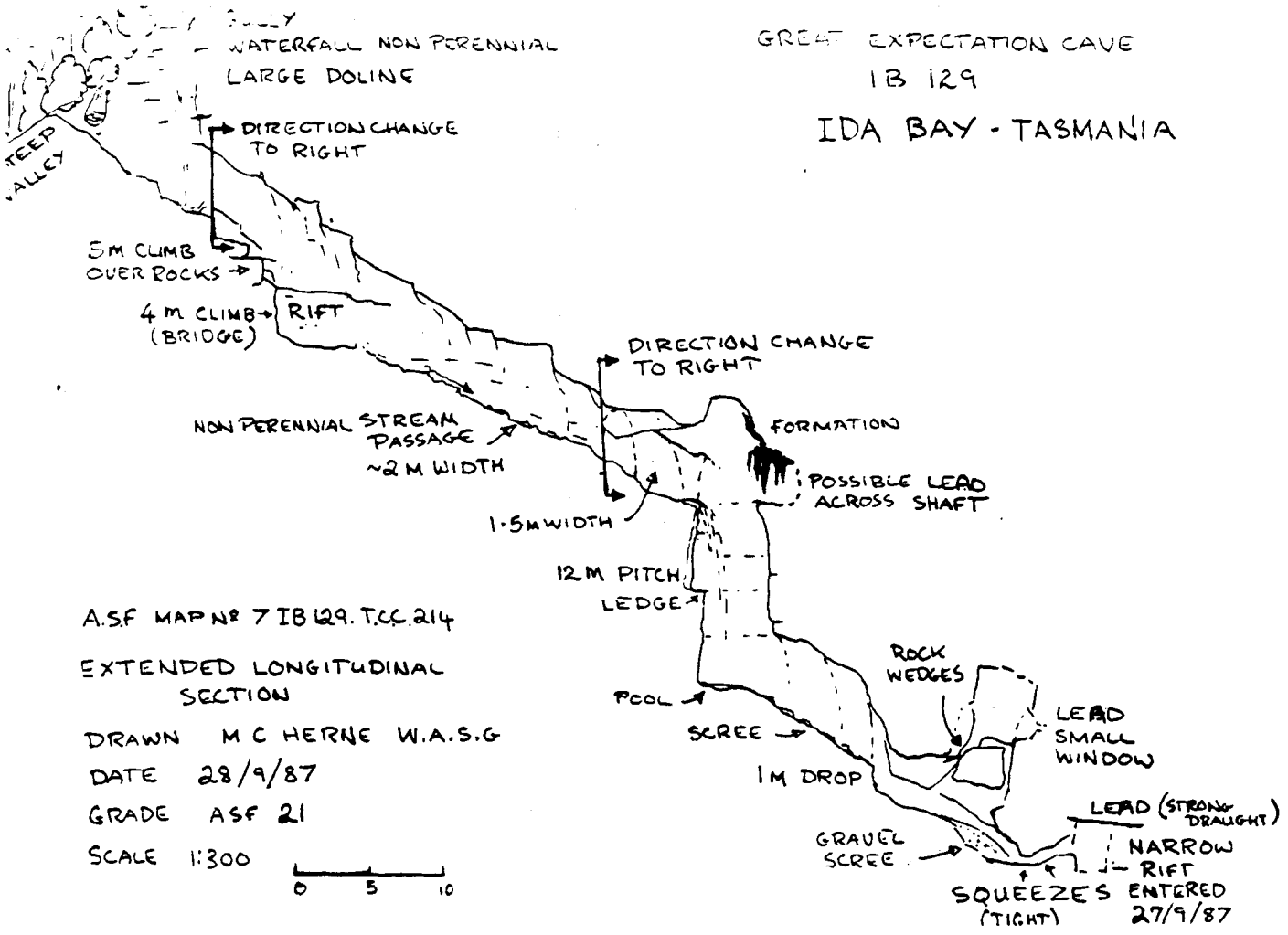
Not To Scale

SIMPLIFIED LONG SECTION



From an original sketch drawing by K. Hosking (October 1985) Reproduced with permission from "EXPLORATION & ACCIDENT IN IB47 (NATIONAL GALLERY) IDA BAY SOUTHERN TASMANIA" [K.F. Hosking, October 1985]

(Additional titles by A. Clarke, 2/11/1991)



GREAT EXPECTATION CAVE

1B 129

IDA BAY - TASMANIA

A.S.F MAP Nº 7 1B 129. T.CC.214

EXTENDED LONGITUDINAL SECTION

DRAWN M C HERNE W.A.S.G

DATE 28/9/87

GRADE ASF 21

SCALE 1:300

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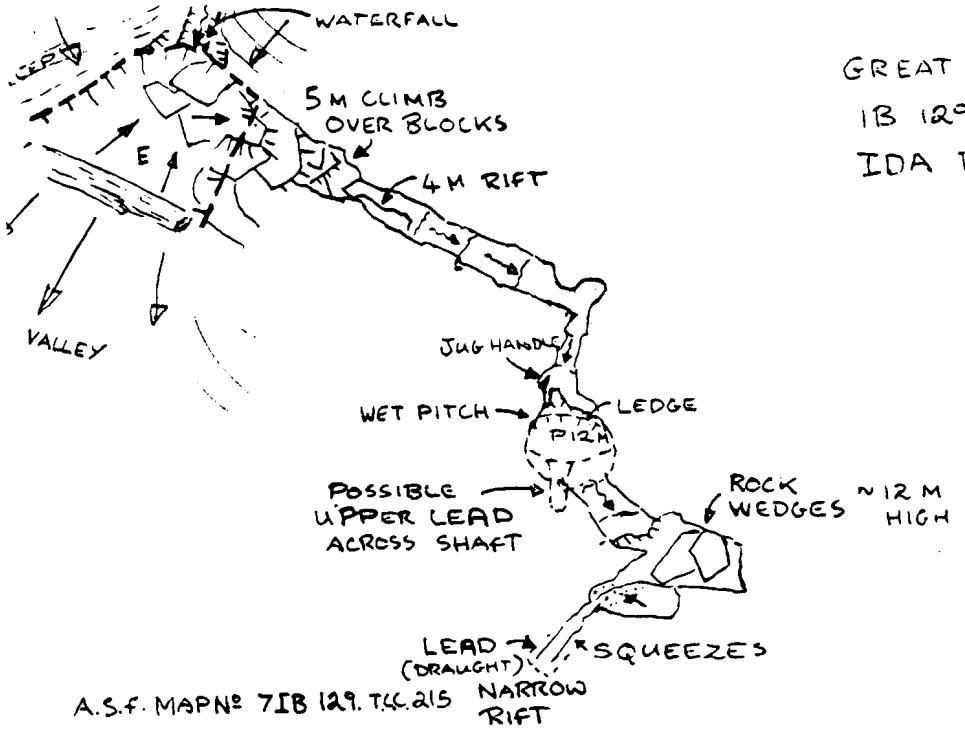

GREAT EXPECTATION CAVE

1B 129

IDA BAY-TASMANIA

A.S.f. MAPNº 7IB 129. T.CC.215

PLAN VIEW

DRAWN - M.C. HERNE

DATE - 28/9/87

GRADE - ASF 21

SCALE - 1:300

0 5 10