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GUIDELINES FOR LEADERS OF UNDERGROUND EXPLORATION

If you intend to lead a party of novices into an old mine, you are responsible for their lives as well as your own. Training and Assessment for Cave and Mine Leadership are available through the Qualifications Management Committee (Qualifications Management Committee - British Caving Association (british-caving.org.uk)of the British Caving Association.

The following advice has been compiled from people who have had many years' experiences in the exploration of disused mines. We do not claim that it is a definitive set of rules, we merely hope that you will take note of the advice and perhaps a tragedy may be avoided through a greater understanding of the dangers facing you underground.

You may be an experienced caver but disused mines contain many dangers not found in natural caves. Unless you can recognise and avoid these dangers you are risking the lives of everyone in your party.

NAMHO has produced Guidelines about the Recreational Use of Mines. We recommend that you follow the advice in that document. http://namho.org/download.php?id=128

ACCESS

1. The problems of access to disused mines are different from those for caves. The existence of mineral rights means that the mine owner is not necessarily the same as the land owner. Remember that it is often less trouble for a mine owner to close the entrance completely than to allow access to explorers. Mining history groups have worked for years, both nationally and locally, to get access agreements. Don't be the one to deny access for everyone through a thoughtless act. Follow these simple rules and help to keep the mines open.

1.1. ALWAYS get permission from the land or mine owner before exploring. If the owner is not known, ask the local mining history group.

1.2. OBEY the Country Code when crossing land to get to the mine.

1.3. NEVER break into a mine, or section thereof, if it has been sealed off and do not trespass if permission has been refused.

1.4. ALWAYS ensure that any gate or lid to a mine entrance is securely replaced after your visit If you are not leaving anyone on the surface during your trip, ensure that the open entrance will not be a danger to cattle or passers-by.

1.5. ALWAYS ensure that you are not contravening Health & Safety Legislation. NAMHO have issued guidelines on this. The NAMHO guidance is available in "Guidelines for the Recreational Use of Mines.

SAFETY

2. NEVER explore disused and abandoned coal mines. They are hazardous places, often with dangerous roof conditions and explosive and toxic gases.

3. ALWAYS check out a mine with an experienced party before taking novices in.

4. FOUR is the sensible safe number underground in case of accident, 1 to stay with the casualty and 2 to go for help.

5. The ratio of novices to experienced persons should be carefully considered and should reflect any complications (e.g. length and severity of the trip). NEVER have a ratio of more than 5 novices to 1 experienced person. Where practical, have an experienced person at the front and rear of the party and, with large numbers, spread the experienced persons amongst the party. CHECK NUMBERS AND RATIO

6. NEVER drink alcohol or take drugs before or during a trip. This can reduce concentration and increases the risk of exposure.

7. NEVER go underground unless properly equipped. The leader is responsible for checking everyone's equipment and should be prepared to leave anyone who is not so equipped on the surface. Disappointment is better than disaster.

8. EVERYONE SHOULD ALWAYS wear a helmet and check that it fits securely before going underground. It should have a chinstrap and be comfortable. The easiest way to check is to shake the head up and down and from side to side - if the helmet moves it is too loose.

9. ALWAYS wear strong boots or wellingtons with a good tread. Note that lace hooks on boots can catch on electron ladders, if these are used.

10. EVERY person must have a light. There is now a wide range of suitable lights available, but types that are powerful enough, are attached to the helmet and have good battery life are best. Always carry spare batteries.

11. EVERY party should carry spare lighting for emergencies

12. EVERY person must wear appropriate clothing the use of modern warm/quick drying fabrics for undersuits, plus a durable oversuit, is best but other warm clothing, with a boiler suit on top might be sufficient. Remember to have a change of dry clothes on surface.

13. ALWAYS tell a responsible person where you are going. Ideally you should give them a written message showing: -

1. Location, grid reference and name of the mine.
2. Anticipated time in the mine
3. Anticipated time out of the mine

4. Time due back at base or transport

Ensure that the person with this message knows what to do if you are overdue and that you contact them when you exit from the mine.

14. IN EMERGENCY you should dial 999 for the POLICE and ask them for CAVE RESCUE. Give them full details of the location of the mine, the extent of injury to the victim and whereabouts in the mine they are. Stay by the telephone unless they say otherwise.

15. Carry some high-calorific food and a drink in case of emergency.

16. Carry a plan of the mine, if available. Your local mining history group can advise you if there is a plan of the mine.

17. ALWAYS count the number of persons in a party before going underground and check regularly during the trip, especially on exit. With absolute novices, allocate a place in the line and tell them to keep their position, to be patient and not to overtake.

18. Just inside the entrance, wait 5 minutes to allow the eyes to get accustomed to the dark. During this time, check that everyone's lamp is working.

19. The helmet will protect your head from a low roof but not against dangers on the floor like rocks or open holes. When moving, keep your eyes mainly on the floor to avoid these dangers. If you want to look around - STOP.

20. Ensure that the party does not become separated. If anyone lags behind, the person in front of them should stop and shout ahead for the party to wait.

21. When you come to a junction, look back and memorise the way out as it can look different from the other way. Better still, leave a marker such as coloured polythene arrows (remember to remove them on the way out) or a line of stones.

22. If someone's light fails, there should be a spare. In emergency, however, you can get someone to walk just behind and to one side and, proceeding slowly, there should be sufficient light for both to see ahead. If all lights fail, be patient and sit it out until rescued. Feeling the way in the dark is courting disaster.

23. NEVER use a mining trip to test endurance and stamina. If someone feels claustrophobic or tired DON'T make them carry on - take them out. Novices should be told that there is no shame in turning back, there will be less embarrassment over this than pushing on and risking an accident.

HAZARDS AND DANGERS

ABANDONED MINES ARE MAN-MADE AND HAVE MANY FEATURES NEVER ENCOUNTERED IN CAVES.

24. Mines are radically different to natural caves. Exploration of mines requires an understanding of the hazards in mines that are significantly different and additional to the hazards found in caves.

25. NEVER touch anything that looks like explosives or detonators. These may be unstable through age and extremely dangerous. Make a note of their position and tell your local mining history group.

26. Mines can be often dangerous places. Underground workings were driven at the least possible cost in order to maximise profit and were usually operated for only a few years. The ground may have lost structural strength over many years. Roof supports installed during mine operations may have deteriorated and be liable to fail. Mines are always deteriorating and new hazards will become evident over time.

27. Stacked stones, timbering, and steel arching may be liable to collapse. Timber and stone structures may be supporting several tonnes of rock that, in the event of a collapse, could cause death or severe injury.

28. The floor of a mine working may consist of timber covering deep shafts below the floor. An apparently safe floor may collapse and cause a person to suffer death or serious injury by falling into open spaces, deep water or suffocating gases.

29. Roof falls may be creating temporary weirs that hold back large volumes of water. The release of this water may cause damage downstream and may cause a mine exit to be submerged, which will prevent escape from the mine.

30. Inrushes of water and rock may happen unexpectedly. Unexpected flooding may completely fill the mine working with water. Collapsing shafts and failing roofs may suddenly block a mine tunnel or cause injury to a person. Changes in ventilation caused by unexpected changes may make the mine air unbreathable and cause death.

31. The rock in which a mine is driven may have low strength and may have deteriorated since the mine was originally driven. Fault lines are a source of weakness and may have been damaged by earth movements after the mine was being worked.

32. When wading through water, beware of flooded shafts in the floor. After the first person has passed, the water becomes muddy and you cannot see anything. Shafts are often to one side of a passage so you may miss them on the way in but find them unexpectedly on the way out! The first person should pass a warning back along the line and mark the position for the trip out.

33. In deep water, keep to the sides of the passage where it is often shallower and (if in solid rock) you can steady yourself on the walls. Beware of submerged rocks on the floor - if you find one, pass a message back. Go at the pace of the slowest person. NEVER race and NEVER swim underground.

34. The edges of shafts can be loose so NEVER stand on the edge. If you must look down then get someone to lifeline you, lie on the floor and peer over the edge. The tops of large shafts can also be timbered over leaving a small access hole. Beware of standing on this timber which may be rotten.

35. Shafts often have drystone walling at the top called "Ginging". When descending, beware of touching this in case you cause it to collapse on people below.

36. NEVER climb on or over old machinery, since it may be severely weakened by rust. Apart from the safety considerations, you may spoil the mine environment for others.

37. In some mines, ladders were used to get from one level to another, with wooden platforms at intervals. In other mines, timbers called "Stemples" were jammed across shafts to climb on. ALL such structures are now suspect through age so should be treated with considerable caution – use additional protection and also consider that you might be damaging items of historic interest.

38. Mineworkings may have less obvious dangers caused by either the presence of toxic gases or low levels of oxygen. A person becoming unconscious in these conditions is likely to die.

39. Common gases encountered in old mineworkings and their effects include:

39.1 Hydrogen Sulphide -Found in shaley areas (especially where pyrites are present) or recently drained levels. It has a characteristic "bad eggs" smell.

39.2 Carbon Dioxide - Found where there is no air flow and, being heavier than air, is often found in blind shafts. It is tasteless and the first signs will be rapid breathing and headaches.

39.3 Methane - Found in coal or shale strata. It is tasteless but highly explosive.

39.4 Oxygen- Lack of oxygen causes disorientation and death.

40.Atmospheric conditions can affect the quantity of gas in a mine and it may be found one day but not the next. If you suspect gas - TURN BACK. Better still, carry a gas meter or a miner's flame lamp. When exploring a shaft, test for gas at the bottom before descending.

41. NEVER light fires underground. Combustion will produce gases which are difficult to detect and lethal.

42. In unventilated mines with no air flow, there is a possible danger of Radon gas which is radioactive. This changes to minute particles which are carried in the air and can be absorbed into the lungs, possibly causing cancer. It is recommended that you do not explore unventilated mines. If you must, it is recommended that you wear a dust mask which absorbs most of these particles.

43. It is recommended that you do not smoke underground because there may be inflammable gas present, Radon particles (if present) are absorbed in smoke particles, it is anti-social if there is little airflow and it disturbs bats

44. Beware of chemicals dumped down shafts - some of these are poisonous.

SAFETY MANAGEMENT OF PEOPLE

THE PREVIOUS SECTIONS HAVE DEALT WITH DANGERS SPECIFIC TO MINES. THE FOLLOWING SECTIONS DEAL WITH GENERAL DANGERS.

45. If the party gets wet or cold, beware of exposure. The warning signs are slowness of movement, unreasonable or irritable behaviour, slurred speech, cramps, shivers and (in more extreme cases) the smell of peardrops on the breath. STOP IMMEDIATELY and take the victim to a suitable spot where they can be kept warm and dry. Give warm drinks, food, glucose tablets and extra clothing if available but NOT alcohol. Place victim in a survival bag and get another person to share body heat by "cuddling". If no improvement after a short rest - GET HELP. NEVER attempt to walk a badly exposed person out under their own steam as this can be fatal.

46. Exposure can set in after an accident and can often be a greater danger than broken bones. If an accident happens in a wet or cold place, it is better to risk further injury by moving the victim to a dry spot out of the direct air flow. Warm drinks should be given since an anaesthetist can deal

with a full stomach if a later operation is necessary. In an underground environment, preventing loss of body heat is much more important.

47. If any person in the party cannot continue, the leader should take the whole party to a safe place or exit the mine.

LADDER CLIMBING, ROPEWORK AND ESPECIALLY SINGLE ROPE TECHNIQUES ARE COMPLEX AND CONTINUALLY DEVELOPING. YOU ARE RECOMMENDED TO TAKE LESSONS FROM THOSE ALREADY PROFICIENT IN THE TECHNIQUES. THE BRITISH CAVING ASSOCIATION OR REGIONAL CAVING COUNCILS CAN PROVIDE INFORMATION ABOUT SUITABLE COURSES.

48. Many mines include the need for vertical movement and these need to be addressed by using single rope technique (SRT) or wire (electron) ladders and lifelines. The preferred practice will vary in different parts of the country (and mines typical for the area), but all should be familiar with the required skills or be undertaking supervised training in the techniques.

49. Lifeline or assisted handlines should be used for any free climbs or ladder climbs, except for short easy scrambles or when SRT is used.

50. NEVER tread on ropes, you may cause damage inside. When cleaning ropes, check that no mud or grit has got inside since this acts as a very good abrasive, shortening the life of the rope and possibly yourself!

51. Check the condition of ropes or wire of electron ladders before use.

52. Clean mud out of the hinges and screw threads of karabiners. If a karabiner has been dropped onto a hard surface, discard it. Invisible hairline cracks can occur which may cause it to break under load.

53. With the use of electron ladders, individuals should be attached to the rope via a sit-harness, or a weight bearing belt.

54. NEVER approach the top of a pitch unless you are protected with ‘cow’s-tails’ or lifelined. It is good practice to keep away until you are ready to descend, otherwise you may accidentally knock rocks down onto a person descending/ascending.

55. NEVER have more than one person on a ladder or rope at any time.

56. Deep shafts can distort sound. Before descending, arrange signals such as a whistle blast or tug on the rope.

57. ALWAYS send an experienced person down a pitch first. At the bottom, move away from the pitch in case of falling rocks.

58. If you ever knock an object down a shaft, shout "BELOW". If you ever hear this shout - NEVER LOOK UP. Get under cover or stand flat against the wall with your head hunched into your shoulders.

59. Transporting equipment down a pitch should be carried out with care. Consider lowering separately.

60. NEVER trust old rings, timbers, etc. as anchor points. Treat existing anchor points and ropes with care.

61. If your party is to separate after descending a pitch, agree some form of message so that the first group back leaves the pitch rigging in place.

62. NEVER remove another party's rigging - one day it might be you stuck at the bottom! If a pitch is already rigged with ladders and there is no space for your ladder, use the one in place and leave your tackle at the top. When using SRT don't interfere with the existing rigging.

63. NEVER use single rope techniques underground unless you are already well-practiced on the surface. Muddy ropes can affect the friction on descenders and cause ascenders to slip or jam up.

64. Clean and check all your equipment after each trip and, if in doubt about the safety of anything, replace it. It is foolish economy to risk your life.

PRESERVING THE UNDERGROUND ENVIRONMENT

65. People explore disused mines for a number of reasons. You might only be interested in a tourist trip but remember that others have different interests, e.g. history, geology, biology, photography, etc.

66. NEVER interfere with old mine buildings or equipment whether underground or on the surface. Removing old tools, etc. is a specialised art and best left to the experts for display in a mining museum. If you find artefacts in a mine, tell the local mining history group.

67. NEVER hammer rock formations indiscriminately. This not only destroys the scenery but can be dangerous in unstable areas. Take only a few specimens for personal use.

68. Never leave graffiti or paint permanent direction signs.

69. NEVER interfere with roosting bats underground. They are protected by law. Try to avoid visits to known bat hibernation sites between November and March. Report any bats seen to the local bat group, the Natural England or national equivalent, or the Flora & Fauna Preservation Society.

70. Many insects and even smaller animals live in mines, often in pools. Some of these animals are rare and damaging their environment can kill the whole population. Avoid muddying pools wherever possible.

71. Many forms of fungus are found in mines where they live on old timber, etc. Some of these are rare and should NEVER be damaged.

72. Mine water is sometimes used as a water supply. and such mines should never be entered.

73. Never pollute underground water and never drink it.

74. Remember - TAKE only photographs. LEAVE only footprints and watch where you leave these. Respect any area that is marked with conservation tape.