

Quarry Diving Distinctive Specialty Course Instructor Outline



This course provides the training required to allow divers
to competently and safely dive in Quarry
adventure diving situations

1. Course Objectives and Standards

A. Course Goals

The goals of the Quarry Diver course are to:

- a) Introduce the student to the Quarry diving aquatic environment
- b) Review relevant dive sites
- c) Identify aquatic life in/features of quarry environments
- d) Identify hazards
- e) Prepare for Quarry diving

B. Quarry Dive Course Requirements

1. Minimum prerequisite certification: PADI Open Water Diver (or equivalent)
2. Minimum age of 15
3. Student to Instructor ratio: 8:1
4. Maximum depth 18 meters [30m if certified as PADI Advanced Open Water or Adventure diver with deep diving experience (or equivalent)]
5. Two (2) Open water dives
6. Minimum course duration is dependent on class size. As a guideline – a nominal duration for a class size of eight (8) students would be two (2) hours for theory; eight hours for practical exercises.

7. Minimum Instructor rating: Open Water Scuba Instructor and Specialty Instructor in the Distinctive Specialty of Quarry Diver

C. Student and Instructor Equipment Requirements

(i) Equipment requirements

1. Student equipment

- a. All standard diving equipment
- b. Underwater light
- c. Camera

2. Instructor equipment

- a. All standard diving equipment
- b. Ropes
- c. Underwater light/s
- d. Camera
- e. Student Record File
- f. Class Roster

(ii) References

a. Recreational Dive Sites

https://en.wikipedia.org/wiki/Recreational_dive_sites

b. Chillagoe: Fossils, Caves, Copper and its Ruddy Gore

<http://fnqdive.com/pdf/issue128chillagoe.pdf>

c. Melrose Quarry Dive:

<https://www.youtube.com/watch?v=51LEV9oKuU0>

d. Quarry diving images:

<https://www.google.com.au/search?q=quarry+diving>

(iii) Recognition materials

- a. PIC envelopes (or PICs on-line)
- b. Specialty Diver Certificates

D. Knowledge Development Topics

The following is an actual presentation outline. Directions to, or comments for the instructor are enclosed in [brackets]

1. Introductions, welcome to the course and course overview:

- a. Introduce yourself and your assistants
- b. Student introductions
- c. Course goals

2. Course overview

- a. Classroom presentations. [Note to instructor: Academic information will be via a short classroom discussion but essentially covered on-site at the dive site location/s. Other academic background will be reviewed through reading web-based text. Give the dates and locations of venue.]
- b. Open water training dives.
- c. Performance assessment. [Note to instructor: You are to ensure that all performance requirements have been met. Skills performed onsite are to be directly observed. Academic assessment may be accomplished through discussions with students and oral quizzes. Tell the class how their performance will be evaluated.]
- d. Certification: Upon successful completion of the course, you will be awarded the PADI Distinctive Specialty Diver Certification of Quarry Diver.

- e. Class requirements: Course costs [Explain all course costs], Equipment needs, and materials used during the course and attendance requirements.
- f. Administration: Collect course fees, enrolment forms, [Continuing Education Administrative Document or Standard Safe Diving Practices Statement of Understanding, PADI Medical Statement, Liability Release and Express Assumption of Risk].

3. *Why Quarry diving?*

Quarries used for diving are often open cast mines that have been left to flood after abandonment. Often offering deep, clear and still waters, these sites are inland and relatively easy to get to. Although presenting their own problems, these are very rewarding dive sites as they are also often surrounded by reminders of days gone by. One case in point would be the quarries at Chillagoe in the far north of Queensland. Please refer to Chillagoe: Fossils, Caves, Copper and its Ruddy Gore

<http://fnqdive.com/pdf/issue128chillagoe.pdf>

Quarry diving locations are often used as training sites for new divers like the famous UK site found at Stoney Cove.

Often stocked with fish and more inanimate objects such as old cars, buses, boats, aircraft and other fanciful objects; the list of contrived scenarios to make these dive sites interesting is endless. To get a better idea of some of the many ideas generated to make quarry diving interesting go to link:

<https://www.google.com.au/search?q=quarry+diving>

(a) *History*

Quarries used for diving obviously started their lives as mining locations. After abandonment these sites were allowed to flood often with much of the mining equipment left behind in situ. Adits (mine entrances) also may be present that lead to further adventures requiring cave diving experience and the use of more specialized equipment. Pursuit of this activity would require such as is available through appropriate cavern and cave diving certification programmes. A typical situation where this in evidence is at “Ruddy Gore” a disused copper mine at Chillagoe in the far north of Queensland.

Chillagoe history is also a good example of what can be in store for the diver venturing out to remote areas such as this. Lying about two and a half hours west of Cairns it has a small population (192 at last census) with a township offering the very basic of amenities. It used to be one of the largest mining centres in all of Queensland but now lays almost bare except for the minimum of basic services. Almost a ghost town compared to its former days.



Remnants of a more industrious age at the Chillagoe copper smelter

Photo by K.Cardwell on expedition to abandoned mine factory

(b) Equipment to use

By their very nature, quarries more often than not become freshwater dive sites and often has similar water temperatures as local marine locations. With this in mind, the equipment required is not much different than used on normal sea dives. However, diving in freshwater will require less weight to become neutrally buoyant and if the quarry is at altitude, concern should be given to depth correction tables and the other idiosyncracies particular to altitude diving. If this is the case it's a good idea to do both Altitude and Freshwater diving specialty courses to give you the tools to perform this type of diving better informed.

5. Hazards

Most quarries do offer clear visibility but this can be reduced by poor buoyancy control and finning action. Quarries are filled with rainwater only and there is no current but unfortunately, soil and other matter that is washed into them tends to gravitate to the bottom and form ever increasing thicknesses of silt. When this is disturbed, visibility can disappear completely. It is clear then that special care should be taken and better than average buoyancy control practiced when touring this type of dive site.

For those sites that have recently been discovered in remote areas such as the "Ruddy Gore" site in Chillagoe, it is advised to first take a sample of the water and have it tested at a reputable laboratory to ensure that it is safe to dive. Chemicals to treat the minerals excavated could have also been left behind when the site was abandoned and has eventually become part of the floodwater's chemistry.

Other hazards are making entry into either flooded mine entrances as

mentioned earlier, or into some of the “wrecks” placed in there to make the quarry dived appear more interesting. This is where skills learned in cavern diving could come into play, particularly with rope work.



Silt build up in the interior of this submerged object could cause “silt-out” as a result of poor buoyancy control and consequently, distress

Picture taken from Quarry diving images:

<https://www.google.com.au/search?q=quarry+diving>

6. Planning and organizing dives

This should be performed not much differently than normal. But be especially aware how close you will be to artifacts in the environment and how it is too easy to get sidetracked taking photos and/or videos and not keeping an eye on your buddy.

Buoyancy control is a very important issue for the photographer/videographer in a quarry situation and greater care should be taken in streamlining equipment. Care should also be taken in particular with feet (fins) and hand placement to avoid damaging one’s self from contact with sharp objects such as rusty car parts or tree branches.

Lines should be used particularly with unfamiliar sites to ensure ease of

navigating back to entry points. However, with the limited geographic area covered by any flooded quarry site and the fact that they are land-locked, certain ease can be realized by knowing you won't get lost when you reach the surface!

Even so, attending a Peak Performance Buoyancy workshop is recommended to improve ability in preventing silt-out and losing yourself while underwater.

7. Open Water Dives

1. Open Water Training Dive One

Learning Objectives.

By the end of this dive, you will be able to:

- *Demonstrate appropriate streamlining of dive equipment.*
- *Perform an appropriate entry.*
- *Correct weighting and adjust buoyancy as required at depth.*
- *Use lines attached to landmark and attach to significant underwater features/artifact/s for future navigation. Take compass bearings.*
- *Perform an ascent rate of no more than 18 metres/minute or as indicated by the divers' computer.*
- *Perform a 3-minute safety stop at 5 metres (if necessary!)*

a. Briefing

- Evaluate conditions
- Facilities at dive site
- Entry technique to be used-location
- Exit technique to be used-location
- Bottom composition, expected features and points of interest
- Depth range
- Planned air supply limit
- Review communication
- What to do if separated from class/buddy
- What to do if an emergency arises
- Buddy assignments

b. Plan Dive

- Assign depth; have students determine theoretical depth (if dive site at altitude and/or using enriched air) and no-decompression limit [Instructor note: you should check these]
- Record no-decompression limit, maximum actual depth and maximum theoretical depth on slates
- Review depth gauges and instrumentation; each student should know how to account for behaviour of his/her instrument while diving
- Assign maximum planned dive time

c. Pre-dive

- Prepare personal equipment including cameras and accessories and all extra emergency equipment
- Don equipment
- Pre-dive safety check
- Proper entry
- Weight adjustment for neutral buoyancy
- Maintain buddy contact

d. Open Water Training Dive One

- Descend in buddy teams
- Use cameras to produce diver and other requisite subject photos (if desired) and go slow!
- Ascent not to exceed 18 metres/minute with a three-minute safety stop at depth of 5 metres.

e. Post-dive

- Proper exit
- Remove and stow equipment

- Rinse cameras
- Sketch terrain covered during the dive indicating significant features/artifact/s

f. Debrief

- Assess performance, make suggestions, give positive reinforcement
- Students calculate their ending pressure groups—review for correct calculation
- Log dive (Instructor signs log)

2. Open Water Training Dive Two

Learning Objectives.

By the end of this dive, you will be able to:

- *Demonstrate appropriate streamlining of dive equipment.*
- *Correct weighting and adjust buoyancy as required at depth*
- *Positioning of lines to both land and underwater fixed object/s*
- *Use camera to produce close-up (or other) shots of site inhabitants/features/artifact/s*
- *Perform an ascent rate of no more than 18 metres/minute or as indicated by the divers' computer.*
- *Perform a 3-minute safety stop at 5 metres.*

a. Briefing

- Evaluate conditions
- Facilities at dive site
- Entry technique to be used-location
- Exit technique to be used-location
- Bottom composition, expected features and points of interest
- Depth range
- Planned air supply limit
- Review communication
- What to do if separated from class/buddy
- What to do if an emergency arises
- Buddy assignments

b. Plan Dive

[Instructor note: Have students plan this dive in buddy teams for your assessment and approval]

- Ensure that students record no-decompression limit, maximum actual depth and maximum theoretical depth on slates (if dive site at altitude and/or using enriched air).

c. Pre-dive

- Prepare personal equipment including action camera and requisite accessories
- Don equipment
- Pre-dive safety check
- Proper entry
- Weight adjustment for neutral buoyancy
- Maintain buddy contact

d. Open Water Training Dive Two

- Descend in buddy teams
- Take photographs of animal/plant life/artifact/s of interest
- Ascent not to exceed 18 metres/minute with a three-minute stop at a depth of 5 metres.

e. Post-dive

- Proper exit
- Remove and stow equipment
- Rinse cameras
- Compare photos with sketch and adjust to make clearer image/drawing for future reference

f. Debrief

- Assess performance, make suggestions, give positive

reinforcement

- Students calculate their ending pressure groups—review for correct calculation
- Log dive (Instructor signs log)
- Complete certification paperwork

8. *KNOWLEDGE REVIEW*

1. Briefly describe a Quarry dive

2. What are two concerns when Quarry Diving?

(i)

(ii)

3. What are two advantages of Quarry Diving?

(i)

(ii)

4. List two hazards that can present on a Quarry Dive?

(i)

(ii)

5. List two issues that would affect your dive plan and briefly explain

why

(i)

(ii)

I have had explained to me and I understand the questions I missed.

Student Signature _____ Date _____

8. KNOWLEDGE REVIEW – MODEL ANSWERS

1. Briefly describe a Quarry dive

An abandoned mine site

2. What are two concerns when Quarry Diving?

(i) Access and egress

(ii) Water chemistry

(iii) Submerged hazards such as protruding sharp objects

3. What are two advantages of Quarry Diving?

(i) Land-based – hard to get lost!

(ii) Freshwater – need less weight for neutral buoyancy and often no need to rinse after the dive!

4. List two hazards that can present on a Quarry Dive?

(i) Silt-out

(ii) Unhealthy water chemistry

5. List two issues that would affect your dive plan and briefly explain why

(i) Altitude – depth correction tables required and possibly changed PG after arrival

(ii) Freshwater – depth correction tables required

I have had explained to me and I understand the questions I missed.

Student Signature _____ Date _____

