State of California . The Resources Agency . Department of Parks and Recreation

Dive Team Refresher Training

September 22 - 26, 2008

Training Syllabus

Emerald Bay State Park

M e m o r a n d u m

Date : July 30, 2008

To : Selected Dive Team Members

From : **Department of Parks and Recreation**
Alex K. Peabody, Aquatic Safety Specialist
Diving Safety Board Chairman

Subject : **2008 Dive Team Refresher Training: September 22 - 26, 2008**

You have been pre-selected to attend State Park Dive Team Refresher Training beginning on Monday, September 22, 2008 at 1500 hours through Friday, September 26, 2008.

Please take the time to carefully read the course syllabus. The training program will include lectures, safety reviews, open water altitude diving skills, and practical exercises for NAUI Scientific Diver certification. Each diver will be participating and contributing to a project report that will be produced on the final day of the course.

For diver safety while engaged in repetitive diving at altitude, divers may not go UP in altitude for at least 24 hours following their last dive on Thursday, Sept. 25th.

Due to safety and fatigue, lodging is available for Friday night and participants are encouraged to spend the night prior to going on the road. Please confirm with the course coordinator, whether you will be spending Friday night.

A pre-training exam is included and must be completed prior to arriving at the refresher training.

Please bring all of your diving equipment including two (2) tanks and weight belt (unless you are flying). Also, bring any equipment or diving related materials that you would like to share with the class.

The course cost for the training will be covered by the State Park Training Center when you submit your travel claim. Your District must pay for the cost of travel to / from the training location.

All lodging and meals are provided at the Granlibakken Conference Center located in Tahoe City, California. Room assignments will be coordinated by Alex Peabody.

Please notify Course Coordinator, Alex Peabody immediately if you are unable to attend or if you have any questions at (831) 649-7132, or Cell phone (831) 402-7805. You can Email Alex at apeabody@parks.ca.gov .

2008 Dive Refresher
September 22 - 26, 2008

COURSE ROSTER

Instructors:

1. **Paul Milosch, LGS, Orange Coast**
2. **Todd Lewis, SSPR, Mendocino**
3. **John Foster, Senior Archeologist, Sacramento HQ**
4. **Ashford Wood, SPR Russian River**
5. **Charles Beeker, Director, Underwater Science and Academic Diving Program, Indiana University**
6. **Ania Budziak, Research Associate, Indiana University and Marine Conservation Specialist, Project AWARE Foundation**

Program Coordinator and Safety Officer: **Alex Peabody, Aquatic Specialist**
Law Enforcement & Emergency Services Division

STUDENTS	CLASSIFICATION	DISTRICT
1. Bockman, Charles	LGS II	Santa Cruz
2. Brady, Kevin	LG	Monterey
3. Bruck, Jeff	LG	San Diego Coast
4. Gates, Ryan	LG	Orange Coast
5. Jones, Alexis	LG	Orange Coast
6. Kelso, Matt	LG	Orange Coast
7. Schuler, Kirby	LG	Orange Coast
8. Kummer, Brian	Ranger	Orange Coast
9. Lane, Brian	Ranger	Orange Coast
10. Raducanu, Daniel	LG	Angeles
11. Rodriguez, Oscar	Maint. Chief I	Angeles
12. Rhee-Pizano, Eddie	LG	Santa Cruz
13. Shelby, Jens	Maint. Mechanic	Mendocino
14. Silvestri, Mike	LGS I (RA)	San Diego Coast
15. Tallman, Karl	Supt. II	Santa Cruz
16. Von Der Lieth, Dion	LG	Channel Coast
17. Wilber, Douglas	P&R Specialist	Headquarters
18. Glenn, Chris	Ranger	Mendocino
19. Oertle, Dean	Ranger	Sierra
20. Walck, Cyndie	Hydrologist/Geologist	Sierra
21.		
22.		
23.		
24.		
25.		
26.		

2008 Dive Refresher
Project Structure

District Liaison:
Sector Supt. Susan Grove

Program Training Coordinator & Project Safety Officer:
Alex Peabody

Lead Dive Instructor:
Charles Beeker

Cultural Resource Project Lead: John Foster

Instructor: Paul Milosch

1. Kevin Brady
2. Dion Von Der Lieth
3. Kirby Shuler
4. Alexis Jones
5. Dean Oertle
6. Cyndie Walck

Instructor: Ania Budziak

7. Jeff Bruck
8. Mike Silvestri
9. Jens Shelby
10. Chris Glenn
11. Ryan Gates
12. Matt Kelso

Instructor: Todd Lewis

13. Chip Bockman
14. Eddie Rhee-Pizano
15. Brian Kummer
16. Brian Lane

Instructor: Ashford Wood

17. Dan Raducanu
18. Oscar Rodriguez
19. Karl Tallman
20. Doug Wilber

} Dive Partners

2008 Dive Team Refresher Training

SYLLABUS

Monday, September 22

Location: Granlibakken Conference Center

Time:	Subject:	Instructor:
1200 – 1500	Check-in	
1500 – 1800	Classroom:	
	Introductions	Alex Peabody
	State Park Dive Team Mission, Purpose, and Policy	
	Diving at Altitude Lecture and NAUI Training • Effects of Altitude on the Human Body • Altitude decompression tables and dive computers	Charlie Beeker
	DPR Pre-Test Altitude Diving Review and Safety Reminders	Paul Milosch
1800	Dinner	

Tuesday, September 23

0715	Breakfast	
	Classroom:	
0800-0900	Underwater cultural resources in California State Parks	John Foster
0900-1000	Emerald Bay's Underwater Fleet & Moorings of Emerald Bay	Charles Beeker
1000-1100	Underwater Data Collection Techniques	Todd Lewis
1100-1200	Detection and reporting of Eurasian watermilfoil, Quagga Mussels, and other invasive species	Tamara Sasaki
1200-1300	Box Lunch and travel to Emerald Bay S.P.	
	Emerald Bay State Park, Boat-in Campground:	
1300-1500	Safety Check of Equipment/Practical Skills Review: • Dive computers and decompression tables • Proper weighting for fresh water • Basic Skills Review • Emergency Skills Review	Dive 1
1500-1700	Begin mapping and documentation of Boat-in Camp Vessel Moorings • Dive groups to inspect and document assigned moorings	Dive 2
1700	Debrief and return to lodge	Charlie Beeker
1800	Dinner	

Wednesday, September 24

0715	Breakfast	
0800-1200	Travel to Dive Site at Emerald Bay S.P. Boat-in Campground • Complete inspections and documentation of moorings • Dive groups to inspect and document assigned sunken vessels • Set-up PORTS for transmission at 1300 hours to Sacramento H.Q.	Dive 3
1200-1300	Box Lunch	
1300-1600	1 hour (1400 hrs.) P.O.R.T.S. transmission to Sacramento H.Q. and narration by John Foster on the sunken vessels and Emerald Bay S.P.	Dive 4
1700	Debrief and travel back to lodge	Charlie Beeker
1800	Dinner	

Thursday, September 25

0715	Breakfast	
0800	Travel to Dive Site	
0900-1200	Sunken Vessel Survey and Inspections	Dive 5
1200	Box Lunch	
1300-1600	Sunken Vessel Survey and Inspections	Dive 6
1600-1700	Debrief and travel back to lodge	Charlie Beeker
1800	Dinner	

Friday, September 26

0800	Breakfast	
0900-1200	Classroom	
	• Altitude Diving Review	Charles Beeker
	• Format and complete Boat Mooring Report	Charles Beeker
	• Format and complete Sunken Vessel Survey Report	John Foster
1200	Lunch	
1300-1600	Complete reports Dive logs P.O.S.T. and Instructor Evaluations Final course debriefing	All
1800	Dinner BBQ with Sierra District Staff and Dive Class	All

Saturday, September 27

0800	Breakfast
0900	Check-out

SAFETY GUIDELINES / PROCEDURES

1. **Classroom emergency exits will be identified prior to classroom instruction.**

2. **There will be no more than a four (6) students to one (1) instructor ratio during any practical skills training.**

3. **A designated Safety Officer will be identified at all times. The Safety Officer will be responsible for all Safety Briefings.**

4. **All injuries (no matter how minor) will be reported to the Safety Officer or an instructor immediately. First aid will be provided by certified emergency medical personnel and will follow standardized medical protocols. Emergency evacuation and transport of injured divers is identified in the Dive Project Plan-Emergency Planning section.**

5. **Safety checks will be conducted on all persons, dive equipment, and vessel(s), prior to beginning dive operations. This safety check includes the readiness of the student and instructors for dive operations and their personal dive equipment.**

6. **Students will adhere to identified safety procedures, follow the theoretical depth at altitude tables, and document their dives throughout the training.**

7. **The practices of SAFE DIVING will be emphasized and followed throughout the training.**

I acknowledge that I have read and understand the safety guidelines and procedures for this training course. I understand that this training is physical demanding and that there are inherent risks from injury and I will be mindful of my personal safety at all times. I will follow to the best of my ability the safety guidelines and will contact the Safety Officer, or an instructor, immediately if I have any questions.

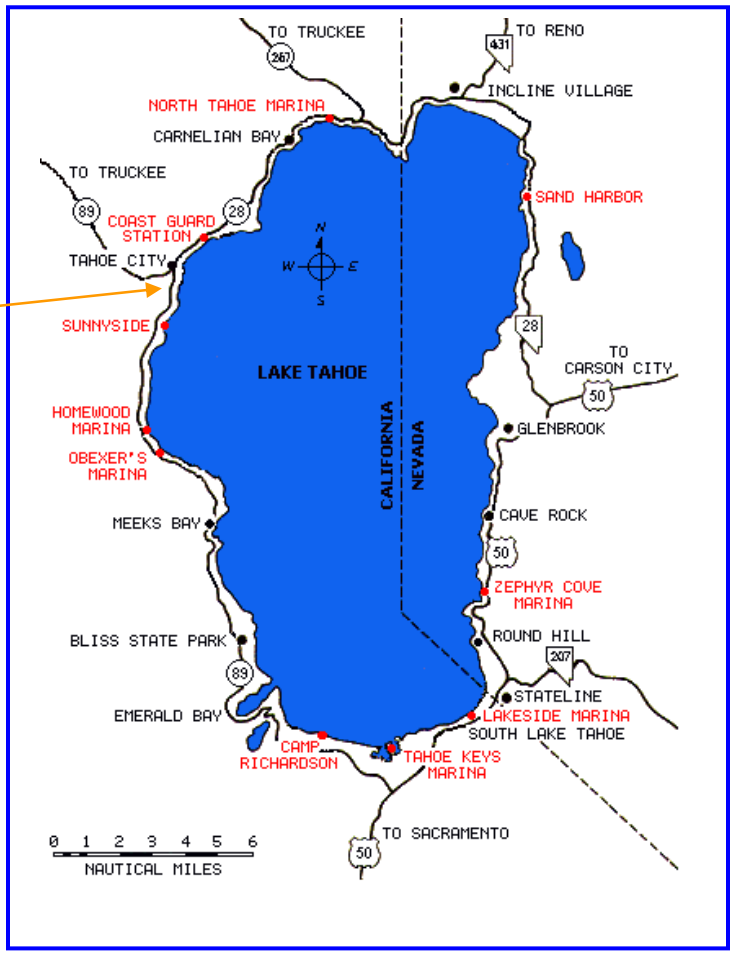
Print your name: _____

Signature: _____ **Date:** _____

Directions to Granlibakken Conference Center:

Getting to Granlibakken

Granlibakken Conference Center and Resort is located in a tranquil mountain setting with all the wonders of the Sierra at your doorstep. Whether you arrive by car or plane, getting here is easy.



We are located at:
725 Granlibakken Road
Tahoe City, CA 96145
Phone: Reservations: 800-543-3221

From Sacramento (100 miles)
From Interstate 80 take Highway 89 south from Truckee to the "Y" in Tahoe City. Follow Highway 89 south for 1/2 mile to Granlibakken Road. Turn right and continue for 3/4 of a mile to the deck overhang of the main lodge.
From Southern California
Follow Highway 395 to Highway 50 west in Carson City. Turn right on Highway 28 along the east and north shores of Lake Tahoe to Tahoe City. Turn left at the stoplight and continue 1/2 mile on Highway 89 to Granlibakken Road. Turn right and continue for 3/4 of a mile to the deck overhang of the main lodge.

From Reno/Tahoe International Airport (54 miles)
Take the Highway 395 north on-ramp from the airport, then exit to Interstate 80 west. Use directions from Sacramento (above).

Airport Shuttle Service
Granlibakken offers its own shuttle service to and from the Reno/Tahoe International Airport. Seven day advance reservations and pre-payment are required. Call (800) 543-3221 for details.

Diver Equipment Checklist:

1. **Two (2) tanks (air)**
2. BC, regulator, pressure gauge
3. Compass
4. Dive Computer (adaptable to altitude diving)
    a. New Batteries (bring an extra!)
5. Wetsuit / drysuit
6. Weight belt
7. Gloves and booties
8. Mask, fins, snorkel
9. Dive light

Weather and Climate

The beauty and character of Lake Tahoe and the Tahoe Basin have been well known since its discovery in 1844. Few places on earth can claim a climate of such great variety and year-round enchantment as that which graces the Sierra. The four sharply defined seasons bring to the high country a continual round of variety and change.

The summer season, like the Tahoe winter, is quite extraordinary. Though easily as dry and sunny as anywhere in the arid desert Southwest, daytime highs rarely exceed 80 degrees. Because of the abundance of heavy pine forests and the moderating influence of the 193 square miles of Lake surface, the evenings do not turn cold. June, July and August average just one day of precipitation each and that can be as little as .10 of an inch. Picnic planning is not a problem in the Tahoe Basin at any time, but in the summer, sun probability is about 93% for the entire 90-day period.

Spring and fall temperatures are very similar, as are both seasons' rainfall figures, though the March/April/May period averages somewhat cooler temperatures and more precipitation than the fall. Rainfall is usually recorded 14 days out of Spring's 90-day period and on 13 days in Autumn. Spring's average high daytime temperature is 56 degrees, with May's record high 88 degrees and record low 12 degrees. In the fall, the daytime high average is 57 degrees, with September's record high 87 degrees and low 12 degrees. Tahoe in late September means generally warm and pleasant days with cold nights and mornings, but there is always the possibility of an early season snow storm—make sure to bring appropriate clothing.

During the 2007 dive refresher (September 24-28, 2007) we experienced beautiful, warm weather throughout the dive days, but on Saturday morning we awoke to 3 inches of fresh snow in the parking lot!

The surface temperature of the main body of the lake, in the summer, is about 67 degrees. Out in the shallow beaches, it is warmer, varying with the temperature of the air, and swimming is enjoyed by thousands. There is a significant thermocline when diving.

Diving in Lake Tahoe

- Maximum Depth: 1645 Ft. off Stateline Point (92 ft below Carson City).
- Lake level is 6225 feet above sea level.
- Surface temperature ranges from 75º F in summer to 37º F in winter.
- Life: Brown, cutthroat, rainbow, salmon, mackinaw trout, f/w sculpin, f/w shrimp, crawdads.

High Altitude Diving
THEORETICAL DEPTH AT ALTITUDE

ActualDepth — Theoretical Depth at Various altitudes (feet)

Sea Level	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
0	0	0	0	0	0	0	0	0	0	0
10	10	11	11	12	12	12	13	13	14	15
20	21	21	22	23	24	25	26	27	28	29
30	31	32	33	35	36	37	39	40	42	44
40	41	43	45	46	48	50	52	54	56	58
50	52	54	56	58	60	62	65	67	70	73
60	62	64	67	69	72	75	78	81	84	87
70	72	75	78	81	84	87	91	94	98	102
80	83	86	89	92	96	100	103	108	112	116
90	93	97	100	104	108	112	116	121	126	131
100	103	107	111	116	120	124	129	134	140	
110	114	118	122	127	132	137				
120	124	129	134	139						
130	135	140								

Safety/Emergency Decompression Stop Depth (feet)

Sea Level	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
15	14	14	13	13	12	12	12	11	11	10

Rules For Altitude Diving:

ASCENT RATE AT ALTITUDE

- 30 feet per minute at all altitudes above sea level

HOW TO FIND YOUR PRESSURE GROUP AFTER ARRIVING AT ALTITUDE

- If your starting altitude is less than dive altitude then add 2 pressure groups for each 1,000 feet of altitude you increase. If starting at altitudes of 4,000' or higher, add 4 pressure groups for each 1,000 feet of altitude increase. If diving at an altitude of 8,000 feet or greater wait 6 hours before diving.

REPETITIVE DIVING
When diving at altitude it is recommended to limit your diving to no more than 2 dives per day. The PADI dive tables should be used when diving at altitude.

SAFETY STOP REQUIREMENT
A safety stop is required for all dives at altitude. The depth of the safety stop changes with altitude. Refer to the above chart for correct depth.

DEPTH GAUGES
Your depth gauge or computer must be adjusted for altitude diving. If you gauge cannot be adjusted then use the following formula to convert the closed bourdon tube gauge to get actual depth.
Depth Shown in feet + 1 foot + (1 foot per 1000 feet above sea level)=Actual depth

California State Parks Dive Team

REFRESHER TRAINING COURSE

PRE-TRAINING EXAM

Please complete <u>prior</u> to arriving at the refresher training.

Name: _____ Date: _____ Score: _____ / 35 pts.

True or False:

1. T F Each individual diver is responsible for his/her personal safety.

2. T F The dive team leader responsible for the fitness inquiry, pre-dive briefing, equipment inspection, and debriefing during each dive.

3. T F Dives may be made in unsafe conditions if the majority of the divers agree.

4. T F Non-departmental certified divers may dive with department divers if they are certified and qualified to participate in the dive project.

5. T F Department divers may SCUBA dive alone if they do not exceed 15 feet in depth.

6. T F Repetitive dives should be plan so that the shallowest dives are first and the deepest dives are last.

7. T F The NOAA Dive Manual is the general procedural manual for all department divers.

8. T F A minimum of 12 dives per year must be made by each DPR diver to retain Departmental dive certification.

9. T F Dives requiring decompression should be avoided.

10. T F Department dive policies may be violated when danger to life exists.

11. T F The PADI Dive Tables should be followed when you are doing repetitive dives at altitude.

12. T F As volume increases, pressure and density decrease.

13. T F Saltwater is denser (weighs more) than freshwater.

14. T F Bubbles will come out of solution faster as temperature increases.

15. T F Breathing pure (100%) oxygen when scuba diving is extremely dangerous.

Multiple Choice:

16. **Department divers are required to surface with at least _____ psi remaining in their tank.**

    A. 1,000 psi
    B. 500 psi
    C. 300 psi
    D. 1500 psi

17. **The maximum depth for recreational scuba divers is….**

    A. 150’
    B. 100’
    C. 130’
    D. 60’

18. **The most applicable physics law in scuba diving is….**

    A. Kenny’s Law
    B. The Milosch Rule of Diving
    C. Loren’s Law
    D. Boyle’s Law

19. **Decompression sickness is caused when _____ is absorbed by the bodies tissues then released in the form of bubbles into the bloodstream.**

    A. oxygen
    B. carbon dioxide
    C. helium
    D. nitrogen

20. **When contact is lost with a dive buddy, what should you do?**

    A. Continue diving on a reciprocal course.
    B. Make a quick 360 degree check, safely ascend to the surface and re-establish contact at the surface.
    C. Return to the beach, or boat as soon as possible and wait for your partner there.
    D. Call 9-1-1, or the Coast Guard immediately.

21. **The proper ascent rate when diving is _____ feet per minute.**

    A. 30’ per minute
    B. 60’ per minute
    C. 90’ per minute
    D. 15’ per minute

22. A depth of 99’ is equal to _____ atmospheres absolute (ATA).

A. 3
B. 5
C. 6
D. 4

23. A balloon filled with 90 liters of air at 33 fsw will have a volume of _____liters at 66 fsw.

A. 4.5
B. 6
C. 12
D. 18

24. 55 fsw is equal to _____ATA.

A. 3
B. 2.6
C. 6
D. 1.5

25. A cylinder of air filled at the surface (sea level) will have _____ the volume of air at 33’ feet.

A. ¼
B. ½
C. ¾
D. the same

26. How many altitude dives should be made in one day if you are on a multiple day repetitive dive project?

A. 1 dive
B. 2 dives
C. 3 dives
D. 4 dives
E. As many dives as you want.

Fill in the answer:

27. Define “altitude diving” and briefly explain why special dive table considerations are needed when diving at altitude.

_____
_____
_____
_____
_____
_____
_____

28. Identify the main difference between flying after diving and diving at altitude.

_____
_____
_____
_____
_____
_____
_____

29. List the recommendations for flying after altitude diving, or driving to a higher altitude after diving.

_____
_____
_____
_____
_____
_____
_____

30. Aside from decompression sickness and air embolism, list two detrimental physiological consequences from diving at altitude and how to avoid them.

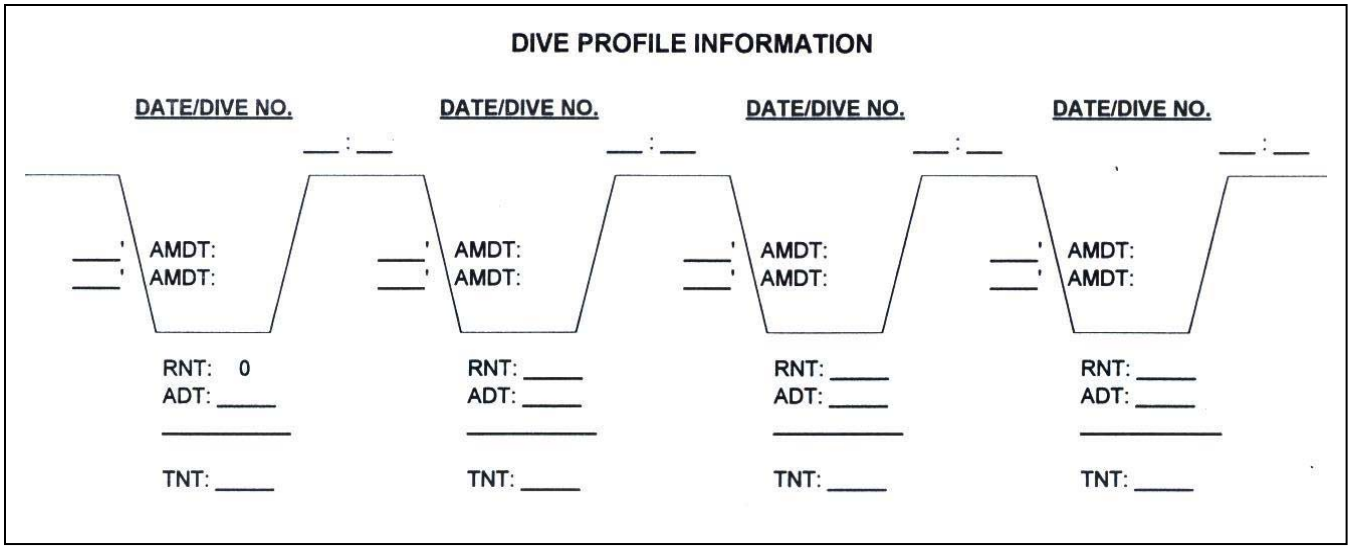
_____
_____
_____
_____
_____
_____

31. You have arrived at Lake Tahoe (6,225 feet) from sea level. According to the PADI dive tables provided, what is your pressure group upon arrival at Lake Tahoe?

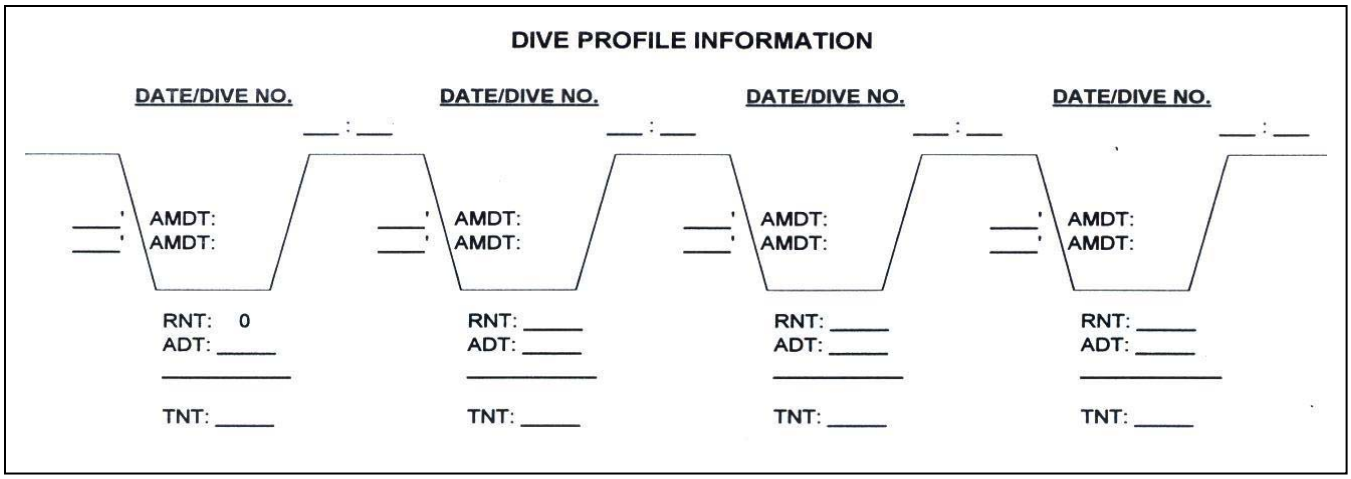
_____

Altitude Dive Table Problems:

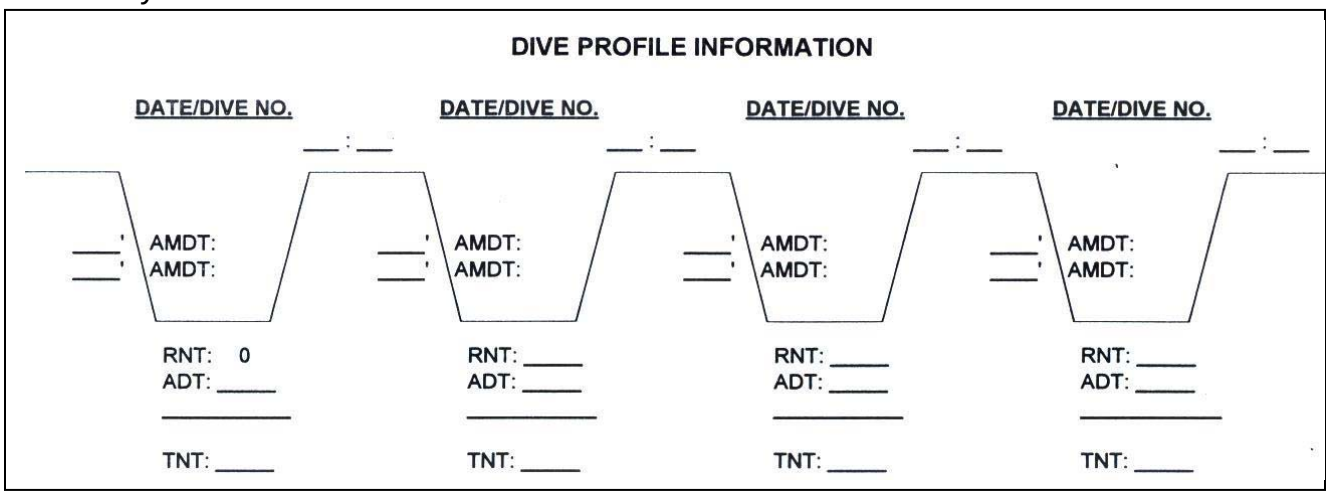
32. A buddy pair dives their first dive **<u>at Lake Tahoe (6225 feet above sea level)</u>** after arriving at Tahoe from sea level and being at lakeside for 8 hours. Their first dive of the day was to 75' for 15 minutes. They have a surface interval of 2 hours. Their second dive and final dive of the day is to a wreck that is located at 50 feet. <u>What will be their maximum bottom time without having to decompress?</u>



33. You are planning your first dive to an actual depth of 60 feet after arriving at an altitude of 3,578 feet from sea level. After a 45 minute surface interval you want to dive the same location to the same depth, what would your no-decompression time limit be for the second dive?



34. You and your dive partner are planning a dive project at an altitude of 4,023 feet. After spending seven hours at the dive site your first dive is to an actual depth of 80 feet with a bottom time of 15 minutes. What is your no-decompression time limit for a second dive to 60 feet if you have a surface interval of 1hour 5 minutes?



35. Explain how altitude affects the following depth gauges and how you compensate for the effects on these gauges:

Digital depth gauge: _____

Bourdon tube depth gauge: _____

Capillary depth gauge: _____

Dive computer: _____

_____

_____

_____

_____

_____

_____

RECREATIONAL DIVE PLANNER™

DIVING SCIENCE & TECHNOLOGY CORP.

START

TABLE 2
SURFACE INTERVAL
CREDIT TABLE

PRESSURE GROUP	DEPTH (feet) 35	40	50	60	70	80	90	100	110	120	130	140
A	10	9	7	6	5	4	4	3	3	3	3	↓
B	19	16	13	11	9	8	7	6	6	5	5	4
C	25	22	17	14	12	10	9	8	7	6	6	5
D	29	25	19	16	13	11	10	9	8	7	7	6
E	32	27	21	17	15	13	11	10	9	8	↓	7
F	36	31	24	19	16	14	12	11	10	9	8	8
G	40	34	26	21	18	15	13	12	11	10	9	
H	44	37	28	23	19	17	15	13	12	11	10	
I	48	40	31	25	21	18	16	14	13	↓		
J	52	44	33	27	22	19	17	15	↓	12		
K	57	48	36	29	24	21	18	16	14	13		
L	62	51	39	31	26	22	19	17	15			
M	67	55	41	33	27	23	21	18	16			
N	73	60	44	35	29	25	22	19				
O	79	64	47	37	31	26	23	20				
P	85	69	50	39	33	28	24					
Q	92	74	53	42	35	29	25					
R	100	79	57	44	36	30						
S	108	85	60	47	38							
T	117	91	63	49	40							
U	127	97	67	52								
V	139	104	71	54								
W	152	111	75	55								
X	168	120	80									
Y	188	129										
Z	205	140										

40 = NO-DECOMPRESSION LIMITS

SAFETY STOP REQUIRED

TABLE 1
NO-DECOMPRESSION LIMITS AND GROUP DESIGNATION TABLE

START OF SURFACE INTERVAL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	0:00 3:00																									
B	0:00 0:47	0:48 3:48																								
C	0:00 0:21	0:22 1:09	1:10 4:10																							
D	0:00 0:08	0:09 0:30	0:31 1:18	1:19 4:19																						
E	0:00 0:07	0:08 0:16	0:17 0:38	0:39 1:27	1:28 4:28																					
F	0:00 0:07	0:08 0:15	0:16 0:24	0:25 0:46	0:47 1:34	1:35 4:35																				
G	0:00 0:06	0:07 0:13	0:14 0:22	0:23 0:31	0:32 0:53	0:54 1:41	1:42 4:42																			
H	0:00 0:05	0:06 0:12	0:13 0:20	0:21 0:28	0:29 0:37	0:38 0:59	1:00 1:47	1:48 4:48																		
I	0:00 0:05	0:06 0:11	0:12 0:18	0:19 0:26	0:27 0:34	0:35 0:43	0:44 1:05	1:06 1:53	1:54 4:54																	
J	0:00 0:05	0:06 0:11	0:12 0:17	0:18 0:24	0:25 0:31	0:32 0:40	0:41 0:49	0:50 1:11	1:12 1:59	2:00 5:00																
K	0:00 0:04	0:05 0:10	0:11 0:16	0:17 0:22	0:23 0:29	0:30 0:37	0:38 0:45	0:46 0:54	0:55 1:16	1:17 2:04	2:05 5:05															
L	0:00 0:04	0:05 0:09	0:10 0:15	0:16 0:21	0:22 0:27	0:28 0:34	0:35 0:42	0:43 0:50	0:51 0:59	1:00 1:21	1:22 2:09	2:10 5:10														
M	0:00 0:04	0:05 0:09	0:10 0:14	0:15 0:19	0:20 0:25	0:26 0:32	0:33 0:39	0:40 0:46	0:47 0:55	0:56 1:04	1:05 1:25	1:26 2:14	2:15 5:15													
N	0:00 0:03	0:04 0:08	0:09 0:13	0:14 0:18	0:19 0:24	0:25 0:31	0:32 0:39	0:40 0:46	0:47 0:51	0:52 0:59	1:00 1:08	1:09 1:30	1:31 2:18	2:19 5:19												
O	0:00 0:03	0:04 0:08	0:09 0:12	0:13 0:17	0:18 0:23	0:24 0:28	0:29 0:34	0:35 0:41	0:42 0:47	0:48 0:55	0:56 1:03	1:04 1:12	1:13 1:34	1:35 2:23	2:24 5:24											
P	0:00 0:03	0:04 0:07	0:08 0:12	0:13 0:16	0:17 0:21	0:22 0:27	0:28 0:32	0:33 0:38	0:39 0:45	0:46 0:51	0:52 0:59	1:00 1:07	1:08 1:16	1:17 1:38	1:39 2:27	2:28 5:28										
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Z Y X W V U T S R Q P O N M L K J I H G F E D C B A

CONTINUE ON OTHER SIDE

PADI
DISTRIBUTED BY INTERNATIONAL PADI, INC.

PRESSURE GROUP AT END OF SURFACE INTERVAL

DEPTH (feet)	Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
35	205	188	168	152	139	127	117	108	100	92	85	79	73	67	62	57	52	48	44	40	36	32	29	25	19	10
		17	37	53	66	78	88	97	105	113	120	126	132	138	143	148	153	157	161	165	169	173	176	180	186	195
40	140	129	120	111	104	97	91	85	79	74	69	64	60	55	51	48	44	40	37	34	31	27	25	22	16	9
		11	20	29	36	43	49	55	61	66	71	76	80	85	89	92	96	100	103	106	109	113	115	118	124	131
50			80	75	71	67	63	60	57	53	50	47	44	41	38	36	33	31	28	26	24	21	19	17	13	7
				5	9	13	17	20	23	27	30	33	36	39	42	44	47	49	52	54	56	59	61	63	67	73
60				55	54	52	49	47	44	42	39	37	35	33	31	29	27	25	23	21	19	17	16	14	11	6
					1	3	6	8	11	13	16	18	20	22	24	26	28	30	32	34	36	38	39	41	44	49
70							40	38	36	34	33	31	29	27	26	24	22	21	19	18	16	15	13	12	9	5
								2	4	6	7	9	11	13	14	16	18	19	21	22	24	25	27	28	31	35
80									30	29	28	26	25	23	22	21	19	18	17	15	14	13	11	10	8	4
											2	4	5	7	8	9	11	12	13	15	16	17	19	20	22	26
90										25	24	23	22	21	19	18	17	16	15	13	12	11	10	9	7	4
												2	3	4	6	7	8	9	10	12	13	14	15	16	18	21
100												20	19	18	17	16	15	14	13	12	11	10	9	8	6	3
														2	3	4	5	6	7	8	9	10	11	12	14	17
110														16	15	14	14	13	12	11	10	9	8	7	6	3
																2	2	3	4	5	6	7	8	9	10	13
120																13	12	12	11	10	9	8	7	6	5	3
																			2	3	4	5	6	7	8	10
130																			10	9	8	8	7	6	5	3
																							3	4	5	7

RETURN TO TABLE ONE

TABLE 3 • REPETITIVE DIVE TIMETABLE

The Recreational Dive Planner is designed specifically for planning recreational (no-decompression) dives on air only. Do not attempt to use it for planning decompression dives.

Safety Stops – A safety stop for 3 mins at 15 ft is required any time the diver comes within 3 pressure groups of a no-decompression limit, and for any dive to a depth of 100 ft or greater.

Emergency Decompression – If a no-decompression limit is exceeded by no more than 5 mins, an 8-min decompression stop at 15 ft is mandatory. Upon surfacing, the diver must remain out of the water for at least 6 hrs prior to making another dive. If a no-decompression limit is exceeded by more than 5 mins, a 15-ft decompression stop of no less than 15 mins is urged (air supply permitting). Upon surfacing, the diver must remain out of the water for at least 24 hrs prior to making another dive.

Flying After Diving Recommendations – 1) Wait a minimum surface interval of 12 hours prior to ascent to altitude. 2) If you plan to make daily, multiple dives for several days or make dives that require decompression stops, take a special precaution – an extended surface interval beyond 12 hours before flight.

Diving at Altitude – Diving at Altitude (1000 feet or greater) requires use of special procedures.

Special Rules for Multiple Dives

If you are planning 3 or more dives in a day: Beginning with the first dive, if your ending pressure group after any dive is W or X, the minimum surface interval between all subsequent dives is 1 hr. If your ending pressure group after any dive is Y or Z, the minimum surface interval between all subsequent dives is 3 hrs.

Note: Since little is presently known about the physiological effects of multiple dives over multiple days, divers are wise to make fewer dives and limit their exposure toward the end of a multiday dive series.

General Rules

- Ascend from all dives at a rate not to exceed 60 ft per min.
- When planning a dive in cold water or under conditions which might be strenuous, plan the dive assuming the depth is 10 ft deeper than actual.
- Plan repetitive dives so each successive dive is to a shallower depth. Limit repetitive dives to 100 ft or shallower.
- Never exceed the limits of this planner and whenever possible avoid diving to the limits of the planner. 140 ft is for emergency purposes only, do not dive to this depth.

25
30

White area indicates *Residual Nitrogen Time* (RNT) in minutes and is to be added to Actual Bottom Time (ABT).

Blue area indicates adjusted no-decompression limits. *Actual Bottom Time* (ABT) should not exceed this number.

Residual Nitrogen Time (RNT)
\+ Actual Bottom Time (ABT)
= Total Bottom Time (TBT)

CAUTION: This product for use only by certified divers or individuals under the supervision of a certified scuba instructor. Misuse of this product may result in serious injury or death. If you are unsure as to how to properly use this product, consult a certified scuba instructor.

VERSION 1.0 010PDE9 PRODUCT NO. 66054

Notes: