

A photograph of a diver underwater, wearing a scuba tank and fins, swimming towards the left. The water is clear and blue-green. The title text is overlaid on a semi-transparent white box at the top of the image.

ALASKA DEPARTMENT OF FISH AND GAME
MANUAL FOR DIVING SAFETY

SPECIAL PUBLICATION NO. 17



Alaska Department of Fish and Game
Division of Commercial Fisheries
P.O. Box 240020
Douglas, AK 99824-0020

March 2002

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Approved on behalf of the Dive Safety Board by:

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6/1/02

Effective Date

¹ The special Publication Series was established in 1989 for the publication of departmental symposium or workshop proceedings, strategic fishery management plans, manuals, reprints of theses or dissertations pertinent to Alaskan fishery management, and other atypical publications of the Division of Commercial Fisheries. In general, the series is intended for fishery professionals and technically oriented fishing industry representatives. Distribution generally will be limited to selected libraries, fishery-related agencies, and interested departmental staff. Copies may be requested from the Alaska Department of Fish and Game at the address on this page. Because articles in this series may not have undergone full editorial processing and complete peer review and may be published elsewhere in the formal literature, they should not be cited without approval of the author or the division.

FOREWORD

This is the third edition of the Alaska Department of Fish and Game's (ADF&G) Dive Safety Manual. The first edition was written by Dave Barto and Gary Liepitz and was adopted in January of 1992. The second edition (effective April 1997) was written to resolve many outstanding issues regarding training, equipment, reciprocity and safe dive practices that had been identified by ADF&G staff over the previous several years. The April 1997 manual, as well as this current edition, draws heavily upon three sources: the American Academy of Underwater Science (AAUS) Standards for Scientific Diving Certification and Operation of Scientific Diving Program, the Manual for Diving Safety of the University of California, San Diego, and the first and second editions of the Alaska Department of Fish and Games' Dive Safe Practices Manual. This manual was adopted by the ADF&G Dive Safety Board by consensus in March 2002 following a process of review, discussion, and editing.

This manual is divided into two main chapters, each specific to the department's diving missions and subsequent governing regulations as defined by OSHA regulations 29 CFR Ch. CVII.

Chapter I: Weir Diving (non-exempt OSHA regulations)

Chapter II: Scientific Diving Standards (OSHA scientific exemption)

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CHAPTER I — WEIR DIVING (NON-EXEMPT OSHA REGULATIONS)

Weir construction and maintenance falls outside the OSHA Scientific Exemption. Department weir diving operations conform to those regulations as defined in Chapter II of this manual with the exception of where contradictions occur between OSHA regulations for commercial diving operations (as defined under 29 CFR Ch. XVII). Where those contradictions occur, OSHA regulations for commercial diving operations are followed.

SECTION 1.00 — GENERAL POLICY, WEIR DIVING STANDARDS

1.10 Weir Diving Definition

The Alaska Department of Fish and Game (ADF&G) has concluded that weir construction and maintenance does not qualify for the federal Occupational Safety and Health Administration (OSHA) Scientific Exemption. Weir diving standards will comply with the OSHA rules for commercial diving (29 CFR, subpart T, section 1910.401 - 1910.440) and all the regulations in Chapters I and II, except Chapter II, Section 5.00 (Scientific Diver Certification).

Weir diving is done to construct, maintain, or remove all structures, devices, and materials associated with a weir. The primary purpose is not to conduct scientific observations or record data, therefore specialized scientific training is not necessary to complete the task (as opposed to Scientific Diving, Chapter II, 1.12). It differs from underwater construction in its simplicity and small scale. Materials are pre-fabricated and only assembly with simple fasteners is required. Parts are easily manipulated by hand, using one to four individuals. No underwater welding, underwater power tools, or other underwater power equipment are used by the divers or in their vicinity.

Weir diving is project-specific, unique, and very atypical to ocean dives. Due to the current, shallow water depth, and the weir structure, the diver is virtually never in a free-swimming state. Instead, the diver finds support against the current by either lying on the weir panels, standing on the weir panels, or standing on the river bottom. The diver often must physically grab hold of the weir to pull himself below the water's surface. The effect of the current on the diver against the angle of the weir is usually to force the diver to the surface; the diver can often only remain submerged by maintaining an effort to do so. Buoyancy control is very basic, usually either very positive to remain on the surface or very negative to stay in contact with the structures. While in the water, divers typically spend more time above the surface than they do below; interchanging between the two positions. Realistically, accurate 'bottom times' are difficult to calculate and maximum depth is usually less than 15 ffw.

SECTION 2.00 — LINE TENDERING

2.10 OSHA Section 1910.424.

Scuba diving shall not be conducted against currents exceeding one knot unless line tended. When solo diving, a standby diver shall be available while a diver is in the water. That diver shall be line-tended from the surface or accompanied by another diver in the water in continuous visual contact during the diving operations. A manual reserve or J-valve with handle is required on all air tanks or an independent reserve cylinder with a separate regulator.

2.20 Exemption to Line Tendering

Exemption to Section 2.10 above was requested by the Westward Regional Dive Safety Officer in May 1997. This request to the ADF&G Dive Safety Officer expressed concerns that line tending a diver was unsafe due to the potential of the line tangling in the weir or on snags. The response from the ADF&G DSO was that if in their judgment, from first hand experience, it was better to have a “rescue diver” on the weir walkway in constant contact with visual hand signals, then line tendering could be exempted as a required practice. Weir divers are not required to be rescue divers and there may be no certified “rescue divers” at the weir. Instead a “dive tender,” either a weir diver or seasonal technician, closely observes the diver in the water at all times. Each of these observers are trained in oxygen administration, CPR, and first aid and are instructed to enter the water (above the weir) if a diver is in need of emergency assistance. Dive tenders normally are not dressed in dive suits.

One diver enters the water at a time without being line tendered. A dive tender is located immediately above the diver on the weir walkway and has continuous clear visual contact whenever a diver is in the water. If constant visual contact cannot be maintained then the diver must be accompanied in the water by a second diver or line tendered. The tender is able to render immediate assistance to the diver if necessary during any portion of the dive. All divers shall use air tanks with a manual reserve or J-valve with handle or an independent reserve cylinder with a separate regulator. A full tank of air with a regulator attached will be at the weir bulkhead or on the weir catwalk whenever a scuba diver is working on the weir. A repeating series of three taps on any metal portion of the weir by a diver underwater will be the signal that the diver needs immediate emergency assistance from the dive tender. **At least one ADF&G scuba diver must be on site at the ADF&G weir field camps and able to come to assistance of any in-water diver at the weirs, or no scuba diving will be allowed until such time that there are at least two divers at the field camp.**

SECTION 3.00 — BUOYANCY COMPENSATORS

Buoyancy compensation devices (BCDs) are optional for weir divers, because BCD’s increase resistance to the current, thereby hindering the performance of the diver and unnecessarily contributing to diver fatigue. An inflatable vest capable of maintaining the diver at the surface in a face-up position, having a manually activated inflation source independent of the breathing supply, plus an oral inflation device, and an exhaust valve shall be worn **(1910.430)** whenever a BCD is not. ADF&G’s Dive Control Board also mandates the use of a pressure gauge, attached to all scuba tanks when in use, and that divers **have surfaced** once tank pressure falls below 500 psi, (this generally is the pressure that a J valve in the up position will need to be pulled down).

SECTION 4.00 — DIVE FLAGS

Diver’s flag(s) shall be displayed prominently whenever diving is conducted. One life ring will be on hand at the weir, in the boat that assists the divers. Medical grade oxygen and a respirator, in a ready-to-use configuration, will be on site during each scuba dive and all divers and dive tenders must be trained in its use. A copy of this plan with emergency phone numbers and first aid information will be near the phone in the field camps.

SECTION 5.00 — DIVING RESTRICTED TO WEIR AND IMMEDIATE ENVIRONS

ADF&G's Dive Safety Board restricts all ADF&G weir divers statewide to dive only at the weirs and immediate environs. Since weir divers do not qualify as scientific divers (which requires additional training) **no ocean, lake, or other diving, except at the weir will be allowed.** This also restricts the use of **any** ADF&G dive gear, skiff, or boat, to be used on any other non-weir activity.

SECTION 6.00 — AUTHORIZATION TO DIVE

Authorization to weir dive will be granted **only** if all required items on "Department Diver Authorization Checklist" (Appendix 15 in ADF&G's Manual for Diving Safety, Chapter II) are met.

SECTION 7.00 — MINIMUM DIVE ACTIVITY TO MAINTAIN CERTIFICATION

If a weir diver is unable in a year's time to complete the minimum of six total scuba dives prior to returning to the weir, then that person(s) shall do a checkout dive at the weir. The weir checkout dive sheet is Table 1 of this document.

SECTION 8.00 — WEIR DIVING SAFETY

In addition to standard safety considerations associated with scuba diving, many of which are outlined in Chapter II, the following items should be considered as particularly hazardous when weir diving.

8.10 Boat Traffic

Local residents routinely operate skiffs in the vicinity of weirs. A dive flag will be posted near the gate opening whenever a diver is in the water. When diving within 20 feet of the boat gate, a skiff bearing a dive flag and a dive tender will be posted at the boat gate to alert and delay traffic. Any time boat traffic is present the dive tenders shall notify the divers, who must immediately surface and observe the traffic until the traffic departs.

8.20 Hypothermia

This is a primary factor during weir installation. During installation, there are frequent times of low diver activity levels as divers must wait for panels or sandbags to be installed. Also, the divers may be in the water much longer than in normal open-water ocean dives. The combination of these factors can lead to hypothermic conditions. Each diver must be aware of and operate only within their own individual limits. Dive tenders must beware that hypothermia can affect a diver's behavior and must look for altered speech or action patterns.

8.30 High Water

In the spring or times of flood, the force of the current can increase considerably. While diving near open panel sections, the diver needs additional effort to avoid being swept downstream past the weir. The diver must evaluate and consider the possibility of a washout. If this possibility is thought to exist, then extra caution should be practiced.

8.40 Entanglement

Normally ropes and lines are not common along the weir. However, the weir panels do have some sharp edges that have the remote possibility of snagging a diver's dry suit or gear. It is recommended that a dive knife be worn at all times by a diver.

8.50 First Aid

Per OSHA regulations, a bag-type manual resuscitator shall be at the dive site in addition to the items listed in Chapter II.

Table 1. Weir diver checkout dive.

Name: _____

Date: _____

Location: _____

Certified Weir Divers-In-Training, and Weir Divers should be able to demonstrate proficiency in the following skills during a checkout dive with the Local Dive Safety Officer (LDSO) or designee:

- Knowledge of department diving standards and regulations
- Pre-dive planning, briefing, site orientation, and buddy check
- Equipment familiarity
- Proper buddy contact
- Monitor cylinder pressure
- Weir dive skills:
 - Shoreline entry
 - Establish neutral buoyancy
 - Stand/balance on weir against current
 - Walk 25 feet along weir
 - Descend to bottom
 - Mask removal and clearing
 - Regulator removal and clearing
 - Underwater swim/pull 25 feet along weir
 - Ascend from bottom, practicing safe ascent
 - Swim/walk upstream 25 feet
 - Shoreline exit
- Rescue briefing:
 - Self rescue techniques
 - Tows of conscious and unconscious victim
 - Simulated in-water rescue breathing
 - Rescue of submerged non-breathing diver (including equipment removal, simulated rescue breathing, towing, and recovery to boat or shore)
 - Use of emergency oxygen on breathing and non-breathing victim
 - Accident management and evacuation procedures

Additional Training (optional)

- Practice rescue of diver drifting downstream of weir (both self rescue and with dive tender)
- Dive Tender ring toss
- Small boat handling (optional)

LDSO (or designee): _____

(signature)

Date: _____

(print name)

CHAPTER II — SCIENTIFIC DIVING STANDARDS (OSHA SCIENTIFIC EXEMPTION)

The American Academy of Underwater Science (AAUS) Dive Safety Manual was developed and written by compiling the policies set forth in the diving manuals of several university, private, and governmental scientific diving programs. These programs share a common heritage with the scientific diving program at the Scripps Institution of Oceanography (SIO). Adherence to the SIO standards has proven both feasible and effective in protecting the health and safety of scientific divers since 1954. In 1985, OSHA exempted scientific diving from commercial diving regulations. The AAUS is recognized by OSHA as the scientific diving standard setting organization. This manual was written so as to comply, or exceed, scientific diving requirements established by OSHA and the standards set by AAUS while at the same time recognizing the special needs of the ADF&G.

SECTION 1.00 GENERAL POLICY — SCIENTIFIC DIVING STANDARDS

1.10 Purpose

The purpose of these Scientific Diving Standards is to ensure that all scientific diving under Alaska Department of Fish and Game (ADF&G) auspices is conducted in a manner that will maximize protection of scientific divers from accidental injury and/or illness, and to set forth standards for training and certification which will allow a working reciprocity between other agencies or academic institutions engaged in scientific research. Fulfillment of the purposes shall be consistent with the furtherance of research and safety. All ADF&G divers should submit any comments and suggestions concerning the ADF&G diving program through their LDSO, to the DSB, for consideration during annual review of the DSM.

1.11 Scientific Diving Definition

Scientific diving is defined (29 CFR 1910.402) as diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks.

1.12 Scientific Diving Exemption

OSHA has granted an exemption for scientific diving from commercial diving regulations under the following guidelines (Appendix B to Subpart T):

- 1.12.1 The Diving Control Board consists of a majority of active scientific divers and has autonomous and absolute authority over the scientific diving program's operation.
- 1.12.2 The purpose of the project using scientific diving is the advancement of science; therefore, information and data resulting from the project are non-proprietary.
- 1.12.3 The tasks of a scientific diver are those of an observer and data gatherer. Construction and trouble-shooting tasks traditionally associated with commercial diving are not included within scientific diving.

1.12.4 Scientific divers, based on the nature of their activities, must use scientific expertise in studying the underwater environment and therefore, are scientists or scientists-in-training.

1.12.5 In addition, the scientific diving program shall contain at least the following elements:

1.12.5.1 Diving Safety Manual (DSM) which includes at a minimum: Procedures covering all diving operations specific to the program; including procedures for emergency care, recompression and evacuation; and the criteria for diver training and certification.

1.12.5.2 Diving Safety (Control) Board (DSB), with the majority of its members being active scientific divers, which shall at a minimum have the authority to: approve and monitor diving projects, review and revise the diving safety manual, assure compliance with the manual (Section 1.30), certify the depths to which a diver has been trained, take disciplinary action for unsafe practices, and assure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for scuba diving.

1.13 Review of Standards

An annual review of ADF&G diving activities shall be completed. Any recommendations for modifications of the standards shall be submitted to the DSB for consideration through your LDSO.

1.20 Operational Control

1.21 ADF&G Auspices Defined

For the purposes of these standards the auspices of the ADF&G includes any scientific diving operation in which the department is connected because of ownership of any equipment used, locations selected, or relationship with the individual(s) concerned. This includes all cases involving the operations of employees of the ADF&G or employees of auxiliary organizations, where such employees are acting within the scope of their employment, and the operations of other persons who are engaged in scientific diving for ADF&G or are diving as members of an organization recognized by ADF&G. The Commissioner of the Alaska Department of Fish and Game has the ultimate authority and responsibility for the conduct of the department's diving program. The DSB is responsible for monitoring of the diving program, interpreting policy, and developing additional policies or rules as needed to assure compliance with all applicable statutes and regulations. The administration of the diving program will reside with ADF&G's Dive Safety Board (DSB).

The regulations herein shall be observed at all locations where scientific diving is conducted.

1.22 ADF&G's Scientific Diving Standards and Safety Manual

ADF&G shall develop and maintain a scientific Diving Safety Manual (DSM), which provides for the development and implementation of policies and procedures that will enable the department to meet requirements of local environments and conditions as well as to comply with the AAUS scientific diving standards. ADF&G's scientific diving standards shall include, but not be limited to:

1.22.1 The AAUS Standards are used as a set of minimal guidelines for the development of ADF&G's scientific diving safety manual.

1.22.2 Emergency evacuation and medical treatment procedures.

1.22.3 The criteria for diver training and certification.

1.22.4 Standards written or adopted by reference for each diving mode utilized which include the following:

1.22.4.1 Safety procedures for the diving operation.

1.22.4.2 Responsibilities of the dive team members.

1.22.4.3 Equipment use and maintenance procedures.

1.22.4.4 Emergency procedures.

1.23 The Diving Safety Officer

The Diving Safety Officer (DSO) serves as a member of the Diving Control Board. This person should have broad technical and scientific expertise in research related diving.

1.23.1 Qualifications

1.23.1.1 The DSO shall be appointed by the Commissioner with the advice and counsel of the DSB.

1.23.1.2 Shall be a qualified scientific diver.

1.23.1.3 Shall be certified as a scuba diving instructor, a certified Dive Master, or have equivalent diving supervisory experience.

1.23.2 Duties and Responsibilities

1.23.2.1 The DSO is responsible, through the DSB, to the Commissioner or his/her designee, for the conduct of all scientific diving under department auspices. The routine operational authority for this program, including the conduct of training and certification, approval of dive plans, maintenance of dive records, ensuring compliance with this manual, and all relevant regulations of the State, rests with the DSO.

1.23.2.2 May delegate portions of this program to a LDSO or DSB member, although the DSO may not delegate responsibility for the safe conduct of ADF&G's dive program.

1.23.2.3 The DSO shall be guided in the performance of the required duties by the advice of the DSB, but the DSO will retain operational responsibility for the conduct of the scientific diving program.

1.23.2.4 The DSO shall suspend any diving activity that in his/her judgment is unsafe or unwise. He/she must also immediately notify the LDSO, DSB, and responsible department regional supervisor of such action. The DSB may recommend resumption of such action by majority vote. Such actions shall be thoroughly documented.

1.24 The Diving Safety Board

1.24.1 ADF&G shall establish and maintain a Diving Safety Board (DSB). The DSB shall consist of a majority of active scientific divers. Voting members shall include the DSO who shall serve as the Commissioner's designee and chair of the DSB. The DSB will be composed of representatives of the diving program such as qualified department scientific divers who meet the standards set forth in this Manual, and those scientific divers who are assigned the duty of LDSO by their respective division directors.

The Diving Control Board:

1.24.2 Has autonomous and absolute authority over the scientific diving program's operation.

1.24.3 Shall approve and monitor diving projects.

1.24.4 Shall review and revise the DSM.

1.24.5 Shall assure compliance with the DSM.

1.24.6 Shall certify the depths to which a diver has been trained and authorized to dive.

1.24.7 Shall take disciplinary action for unsafe practices.

1.24.8 Shall assure adherence to the buddy system for scuba diving.

1.24.9 Is responsible to the Commissioner through the DSO. The DSB shall act as the ADF&G's representative in matters concerning ADF&G's dive program.

1.24.10 Shall act as a board of appeal to consider diver-related problems.

1.24.11 Shall recommend the issue, reissue, or the revocation of diving certifications.

1.24.12 Shall recommend changes in policy and amendments to ADF&G's DSM, as needed.

1.24.13 Shall establish and/or approve training programs through which the applicants for certification can satisfy the requirements of this manual.

1.24.14 Shall suspend diving programs which it considers to be unsafe or unwise and immediately notify the appropriate regional supervisor.

1.24.15 Shall establish criteria for equipment selection and use.

1.24.16 Shall recommend new equipment or techniques.

1.24.17 Shall establish and/or approve facilities for the inspection and maintenance of diving and associated equipment.

1.24.18 Shall ensure that air station(s) used by ADF&G meet air quality standards as described in Section 3.60 of this manual.

1.24.19 Shall periodically review the Diving Safety Officer's performance and program.

1.24.20 Shall sit as a board of investigation to inquire into the nature and cause of diving accidents or violations of ADF&G's diving manual.

1.25 Local Dive Safety Officer(s)

The Department of Fish and Game operates a very diverse scientific program over an extremely large geographic area. To effectively implement ADF&G's mission, it is organized by Division (Commercial Fisheries, Sport Fisheries, Habitat and Restoration, and Wildlife Conservation) and then by Region (three or four depending upon division). To assure effective implementation of this dive safety manual, a Local Dive Safety Officer (LDSO) shall be appointed at either the division or regional level, depending upon the scope of diving programs in the respective divisions, with the advice and counsel of the DSO. Each Division that undertakes diving shall have an LDSO unless specific arrangements are made for another division, region, or the DSO, to assume the responsibility for an LDSO for a specific organizational unit of ADF&G. Divisions may be charged through a reimbursable services agreement (RSA) for the services of a LDSO or DSO.

1.25.1 The LDSOs shall be a qualified scientific department diver and underwater instructor from a nationally recognized agency, certified dive master (see Section 1.27) or have equivalent supervisory experience.

1.25.2 Under the supervision of the DSB, the LDSO is responsible for the following activities in a division or region:

1.25.2.1 Certify when candidate divers have met the requirements of certification set out in this manual.

1.25.2.2 Review and recommend approval or disapproval of dive plans submitted to the DSB.

1.25.2.3 Supervise the maintenance of records necessary to ensure compliance with this manual.

1.25.2.4 Suspend any diving activity that in his/her judgment is unsafe or unwise. He/she must immediately notify the DSO, and responsible department regional supervisor or divisional director, of such action.

1.25.2.5 Develop specific equipment standards for the division, or region in which the LDSO serves that are consistent with those adopted by the DSB.

1.25.2.6 Develop training requirements for review and approval of the DSB to tailor or supplement ADF&G's Scientific Diver Certification requirements that fulfill needs particular to the activities in a division or region.

1.26 Instructional Personnel

1.26.1 Qualifications

All personnel involved in diving instruction under department auspices shall be qualified for the type of instruction being given.

1.26.2 Selection

The DSO or LDSO, who may solicit the advice of the DSB, will select instructional personnel. The DSB will accept as proof of qualification a current certification to teach that subject from a nationally recognized training organization. The DSB may allow training by other individuals who can demonstrate competence and experience in a particular subject area.

1.27 Dive Master or Lead Diver

All dive operations under department auspices will be under the control of a dive master, or if allowed by the DSB, a lead diver. He/she is responsible at that location and time for coordinating, briefing, and planning as outlined in this section unless exempted by the DSB. The dive master or lead diver shall be responsible for:

1.27.1 Coordination with other known activities in the vicinity that are likely to interfere with diving operations.

1.27.2 Ensuring all dive team members possess current certification, and are qualified for the type of diving operation.

1.27.3 Planning dives in accordance with Section 2.21.

1.27.4 Ensuring safety and emergency equipment is in working order and at the dive site.

1.27.5 Briefing the dive team members on:

1.27.5.1 Dive objectives.

1.27.5.2 Unusual hazards or environmental conditions likely to affect the safety of the diving operation.

1.27.5.3 Modifications to diving or emergency procedures necessitated by the specific diving operation.

1.27.6 Suspending diving operations if in his/her opinion conditions are not safe.

1.27.7 Reporting to the LDSO, DSO, and DSB any physical problems or adverse physiological effects including symptoms of pressure-related injuries.

1.27.8 Shall be qualified to assist, as required, in the training of department employees participating in their field practicum (Section 5.34) necessary to gain certification as a scientific diver.

1.28 Reciprocity and Visiting Scientific Diver

1.28.1 Two or more organizations engaged jointly in diving activities, or engaged jointly in the use of diving resources, shall designate one of the participating Diving Control Boards to govern the joint dive project.

1.28.2 A scientific diver from one organization shall apply for permission to dive under the auspices of another organization by submitting to the Diving Safety Officer of the host organization a document containing all the information described in Appendix 8 (letter of reciprocity) signed by the Diving Safety Officer or Chairperson of the home Diving Control Board.

1.28.3 A visiting scientific diver may be asked to demonstrate his/her knowledge and skills for the planned diving. An example of items to be demonstrated is presented in Appendix 9 (checkout dive).

1.28.4 If a host organization denies a visiting scientific diver permission to dive, the host DSB shall notify the visiting scientific diver and his/her DSB with an explanation of all reasons for the denial.

1.28.5 The DSB may develop reciprocity agreements with organizations after review of that organization's Dive Safety Manual, appropriate Standard Operating Procedures, or Diving Rules.

1.29 Waiver of Requirements

The DSB may grant a waiver for specific requirements of training, examinations, depth certification, and minimum activity to maintain certification.

1.30 Consequence of Violation of Regulations by Scientific Divers

Failure to comply with the provisions of this manual may be cause for revocation or restriction of a diver's certificate by the DSB, DSO, LDSO, regional supervisor, or director, and may result in disciplinary action by the employee's supervisor.

1.40 Consequences of Violation of Regulations by ADF&G

ADF&G shall maintain compliance with OSHA scientific diving standards. Failure to comply with ADF&G regulations and standards may be cause for the revocation or restriction of ADF&G's scientific diving status.

1.50 Record Maintenance

The DSO and LDSO shall maintain a permanent record for each department diver. The file shall include evidence of certification level, log sheets, results of physical examinations, any waivers that may have been granted, reports of disciplinary actions by the DSB for failure to comply with provision of this manual, accident or injury reports related to diving, evidence of all dive training attempted or accomplished by the diver, and other pertinent information deemed necessary.

1.50.1 Availability of Records:

1.50.1.1 All medical records retained by ADF&G for a current or former divers shall be made available to an attending physician if the diver has granted her/his consent in writing. It is department policy to encourage all employees to grant such consent at the time of certification.

1.50.1.2 Records and documents required by this standard shall be retained by ADF&G for the following period:

1.50.1.2.1 All records shall be retained for the duration of an individuals employment with ADF&G and for a minimum of five years following termination of employment.

1.50.1.2.2 Manual for diving safety — current document only.

1.50.1.2.3 Equipment inspection and testing records are to be retained by each project leader until equipment is withdrawn from service.

1.50.1.3 The DSO and members of the DSB shall have access to the files of each diver. The employee, the employee's supervisor, and others in the employee's chain of command shall be allowed access to the employee's file.

SECTION 2.00 — DIVING REGULATIONS FOR SCUBA (OPEN CIRCUIT, COMPRESSED AIR)

2.10 Introduction

No person shall engage in scientific diving operations under ADF&G auspices unless he/she holds a current certification issued pursuant to the provisions of this manual.

2.20 Pre-Dive Procedures

2.21 Dive Plans

All diving under department auspices shall be in accordance with a dive plan that has been approved by the DSB. Dives will be planned around the competency of the least experienced diver. Dive plans shall consider and include the following information:

2.21.1 Divers qualifications, and the type of certificate or certification held by each diver.

2.21.2 Emergency plan (see Appendix 10) with the following information:

2.21.2.1 Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.

2.21.2.2 Nearest operational recompression chamber.

2.21.2.3 Nearest accessible hospital.

2.21.2.4 Available means of transport.

- 2.21.3 Approximate number of proposed dives.
- 2.21.4 Location(s) of proposed dives.
- 2.21.5 Estimated depth(s) and bottom time(s) anticipated.
- 2.21.6 Decompression status and repetitive dive plans, if required.
- 2.21.7 Proposed work, equipment, and boats to be employed.
- 2.21.8 Any hazardous conditions anticipated.

2.22 Pre-dive Safety Checks

2.22.1 Diver's Responsibility:

2.22.1.1 Each scientific diver shall conduct a functional check of his/her diving equipment in the presence of the diving buddy or tender.

2.22.1.2 It is the diver's responsibility and duty to refuse to dive if, in his/her judgment, conditions are unfavorable, or if he/she would be violating the precepts of his/her training, or of this manual.

2.22.1.3 No dive team member shall be required to be exposed to hyperbaric conditions against his/her will, except when necessary to prevent or treat a pressure-related injury.

2.22.1.4 No dive team member shall be permitted to dive for the duration of any known condition which is likely to adversely affect the safety and health of the diver or other dive members.

2.22.2 Equipment Evaluations

2.22.2.1 Each diver shall insure that his/her equipment is in proper working order and that the equipment is suitable for the type of diving operation.

2.22.2.2 Each diver shall wear and check his/her device for maintaining positive buoyancy (variable volume dry suits do not qualify as such a device).

2.22.3 Site Evaluation

The environmental conditions at the site will be evaluated.

2.30 Diving Procedures

2.31 Solo Diving Prohibition

All diving activities shall assure adherence to the buddy system (two comparably equipped scuba divers in the water in constant communication) for scuba diving. This buddy system is based upon mutual assistance, especially in the case of an emergency. If effective communication is lost, all divers shall surface and remain there until contact is reestablished. Solo diving is prohibited.

2.32 Refusal to Dive

2.32.1 The decision to dive is that of the diver. A diver may refuse to dive, without fear of penalty, whenever he/she feels it is unsafe for them to make the dive (see Section 2.22.1). Other dive team members shall support a decision not to dive made by a member of their team.

2.32.2 Safety

The ultimate responsibility for safety rests with the individual diver. It is the diver's responsibility and duty to refuse to dive if, in his/her judgment, conditions are unsafe or unfavorable, or if he/she would be violating the precepts of his/her training or the regulations in this manual.

2.33 Termination of the Dive

2.33.1 It is the responsibility of the diver to terminate the dive, without fear of penalty, whenever he/she feels it is unsafe to continue the dive, unless such a decision compromises the safety of another diver already in the water (see Section 2.22.1).

2.33.2 The dive shall be terminated while there is still sufficient cylinder pressure to permit the diver to safely reach the surface, including decompression time, or to safely reach an additional air source at the decompression station, such that a minimum of 500 psig remains in the individuals tank, in the buddy group, with the least amount of tank pressure.

2.34 Emergencies and Deviations from Regulations

Any diver may deviate from the requirements of this manual to the extent necessary to prevent or minimize a situation which is likely to cause death, serious physical harm, or major environmental damage. A written report of such actions must be submitted to the DSB explaining the circumstances and justifications.

2.40 Post-Dive Procedures

2.41 Post-Dive Safety Checks

2.41.1 After the completion of a dive, each diver shall report any physical problems, symptoms of decompression sickness, or equipment malfunctions to the diver in charge of operations.

2.41.2 Divers shall remain awake for at least one hour after diving, and in the company of a dive team member who is prepared to transport him/her to a hyperbaric chamber if necessary.

2.50 Emergency Procedures

ADF&G will develop emergency procedures and must include procedures for emergency care, recompression, and evacuation for each dive location (see Appendix 10). Application and implementation of these emergency procedures shall be addressed with each dive plan.

2.60 Flying After Diving

Divers shall have a minimum surface interval of 12 hours before ascending to 8,000 altitude (i.e. commercial airline) and below this altitude under no circumstances shall a diver exceed NOAA regulations, described in NOAA Diving Manual – 2001, Fourth Edition. See Appendix 18 for additional information.

2.70 Record Keeping And Requirements

2.71 Personal Diving Log

Each certified scientific diver shall maintain a log of every dive made under department auspices, and is encouraged to log all other dives. An individual's dive log synopsis must be submitted annually to the LDSO. Dive logs shall be based on a calendar year. Access to the logbook data is authorized for the DSO, LDSO(s), and other department employees who have a legitimate need to review these records. These records represent the official department copy of dive logs and are part of each diver's permanent record. Minimum information required in the individual's submitted diving log shall include at least the following:

2.71.1 Name of diver.

2.71.2 Total time (in minutes) and total number of dives per project.

2.71.3 Purpose and general nature of diving activities (e.g. what project are you working on: herring, sea cucumber, sea urchins, sea lion capture, weir installation, and maintenance).

2.71.4 Detailed report of any near or actual incidents.

2.71.5 Summary diving statistics shall be forwarded from each LDSO, to the DSO, for inclusion into each divers permanent file.

2.72 Required Incident Reporting

All diving incidents requiring recompression treatment, or resulting in moderate or serious injury, or death shall be reported to the employee's supervisor, the DSO, and the LDSO. The DSO or LDSO and the employee's supervisor shall investigate and document such an incident. The report will specify the circumstances of the incident and the extent of any injuries or illnesses. Additional information must meet the following reporting requirements:

2.72.1 Such a report will include a current State of Alaska Accident/Injury Report form, a description of symptoms (including log book data and time of onset), and results of any treatment. The report shall be filed in the permanent records of the DSO and a copy forwarded to other appropriate state agencies. A copy will be filed in accordance with standard State of Alaska accident/injury reporting required by the Department of Labor.

2.72.2 If pressure-related injuries are suspected, or if symptoms are evident, the following additional information shall be recorded and retained by ADF&G, with the record of the dive:

2.72.2.1 Complete Incident Report Form (Appendix 11).

2.72.2.2 Written descriptive report to include:

2.72.2.2.1 Name, address, and phone numbers of the principal parties involved.

2.72.2.2.2 Summary of experience of divers involved.

2.72.2.2.3 Location, description of dive site, and description of conditions that led up to incident.

2.72.2.2.4 Description of symptoms, including depth and time of onset.

2.72.2.2.5 Description and results of treatment.

2.72.2.2.6 Disposition of case.

2.72.2.2.7 Recommendations to avoid repetition of incident.

2.72.3 The DSB shall investigate and document any incident of significant dive related injury.

SECTION 3.00 — DIVING EQUIPMENT

3.10 General Policy

3.10.1 Only department certified divers, divers in training, or divers defined under Section 1.28, shall be issued, or use ADF&G owned equipment. All equipment shall meet standards as determined by the DSO and the DSB. Equipment that is subjected to extreme usage under adverse conditions should require more frequent testing and maintenance.

3.10.2 All equipment shall be regularly examined by the person using it.

3.10.3 Considering that many department dive operations are on-going in nature, and that many department employees often rotate through the duty for such operations within a region or division, and considering that the margin of safety is increased when divers are fully familiar with the specific equipment used by their diver buddy, it is a goal for each department diver to be similarly equipped. Each region or division, as part of its dive plans shall develop, in consultation with the DSB, an approved list of the following equipment for use by all divers within a region or division.

3.10.3.1 Weighting system

3.10.3.2 Tanks

3.10.3.3 Regulator with octopus or other alternate air source

3.10.3.4 Buoyancy compensating device (BCD)

3.10.3.5 Backpack

3.10.3.6 Dive computer

3.10.3.7 Variable volume dry suit

3.20 Equipment

3.21 Regulators

3.21.1 Approval. Only those makes and models specifically approved by the LDSO and the DSB shall be used.

3.21.2 Inspection and testing. Scuba regulators shall be inspected and tested prior to first use and a minimum of every 12 months thereafter by a factory authorized technician.

3.21.3 Regulators will consist of a primary second stage and an alternate air source (such as an octopus second stage, BC mounted second stage, or redundant air supply).

3.22 Breathing Masks and Helmets

Breathing masks and helmets shall have:

3.22.1 A non-return valve at the attachment point between helmet or mask hose, which shall close readily and positively.

3.22.2 An exhaust valve.

3.22.3 A minimum ventilation rate capable of maintaining the diver at the depth to which he/she is diving.

3.23 Scuba Cylinders

3.23.1 Scuba cylinders shall be designed, constructed, and maintained in accordance with the applicable provisions of the Unfired Pressure Vessel Safety Orders.

3.23.2 Scuba cylinders must be hydrostatically tested in accordance with DOT standards.

3.23.3 Scuba cylinders must have an internal inspection at intervals not to exceed twelve months and must have a verifying, dated sticker attached to each tank.

3.23.4 Scuba cylinder valves shall be functionally tested at intervals not to exceed 12 months.

3.24 All backpacks without integrated floatation devices and weight systems shall have a quick release device designed to permit jettisoning with a single motion from either hand.

3.25 Gauges

3.25.1 Gauges shall be inspected and tested before first use and every twelve months thereafter. Inaccurate gauges shall not be used. A record of inspections, tests, and repairs shall be maintained.

3.26 Flotation Devices

3.26.1 Each diver shall have the capability of achieving and maintaining positive buoyancy. The device must be capable of oral inflation as well as inflation from the divers air supply. Such a device is required in addition to a dry suit.

3.26.2 Personal flotation systems, buoyancy compensators, dry suits, or other variable volume buoyancy compensation devices shall be equipped with an exhaust valve.

3.26.3 These devices shall be functionally inspected and tested at intervals not to exceed twelve months.

3.27 Timing Devices, Depth and Pressure Gauges

Both members of the diving pair must have an underwater timing device, a depth indicator, and a submersible pressure gauge. Divers undertaking repetitive dives over two or more days shall use a dive computer.

3.28 Determination of Decompression Status: Dive Tables, Dive Computers

3.28.1 A set of diving tables, approved by the LDSO, must be available at the dive location.

3.28.2 Dive computers or diving tables will be utilized.

3.28.3 See Appendix 12 for recommendations on dive computer use.

3.30 Auxiliary Equipment

All auxiliary equipment shall be of a type approved by the DSO, LDSO, and/or the DSB.

3.31 Hand-held underwater power tools.

Power tools and equipment used underwater shall be specifically approved for underwater use. Power tools and equipment supplied with power from the surface shall be de-energized before being placed into or retrieved from the water. Hand held power tools shall not be supplied with power from the dive location until requested by the diver.

3.40 Support Equipment

3.41 First Aid Supplies

A first aid kit and emergency oxygen administration equipment shall be available at the dive location.

3.42 Diver's Flag

A diver's flag shall be displayed prominently whenever diving is conducted under circumstances where required or where water or amphibious aircraft traffic is probable.

3.43 Compressor Systems — Department Controlled

The following will be considered in design and location of compressor systems:

3.43.1 Low pressure compressors used to supply air to the diver if equipped with a volume tank shall have a check valve on the inlet side, a relief valve, and a drain valve.

3.43.2 Compressed air systems over 500 psig shall have slow-opening shut-off valves.

3.43.3 All air compressor intakes shall be located away from areas containing exhaust or other contaminants.

3.44 Oxygen Systems

3.44.1 Equipment used with oxygen or mixtures containing over forty percent (40%) by volume oxygen shall be designed and maintained for oxygen service.

3.44.2 Components exposed to oxygen or mixtures containing over forty percent (40%) by volume oxygen shall be cleaned of flammable materials before being placed into service.

3.44.3 Oxygen systems over 125 psig shall have slow-opening shut-off valves.

3.50 Equipment Maintenance

3.51 Record Keeping

Each project leader or designee shall be responsible for providing the LDSO with an inventory and a maintenance schedule for all equipment under their control. Each equipment modification, repair, test, calibration, or maintenance service shall be logged, including the date and nature of work performed, serial number of the item, and the name of the person performing the work for the following equipment:

3.51.1. Regulators

3.51.2 Submersible pressure gauges

3.51.3 Depth gauges

3.51.4 Scuba cylinders

3.51.5 Cylinder valves

3.51.6 Diving helmets

3.51.7 Submersible breathing masks

3.51.8 Compressors

3.51.9 Gas control panels

3.51.10 Air storage cylinders

3.51.11 Air filtration systems

3.51.12 Analytical instruments

3.51.13 Buoyancy control devices

3.51.14 Dry suits

3.52 Compressor Operation and Air Test Records

3.52.1 Gas analyses and air tests shall be performed on each department breathing air compressor at regular intervals of no more than 100 hours of operation or six months, whichever occurs first, or when the compressor is returned to service from storage. The results of these tests shall be entered in a formal log and be maintained.

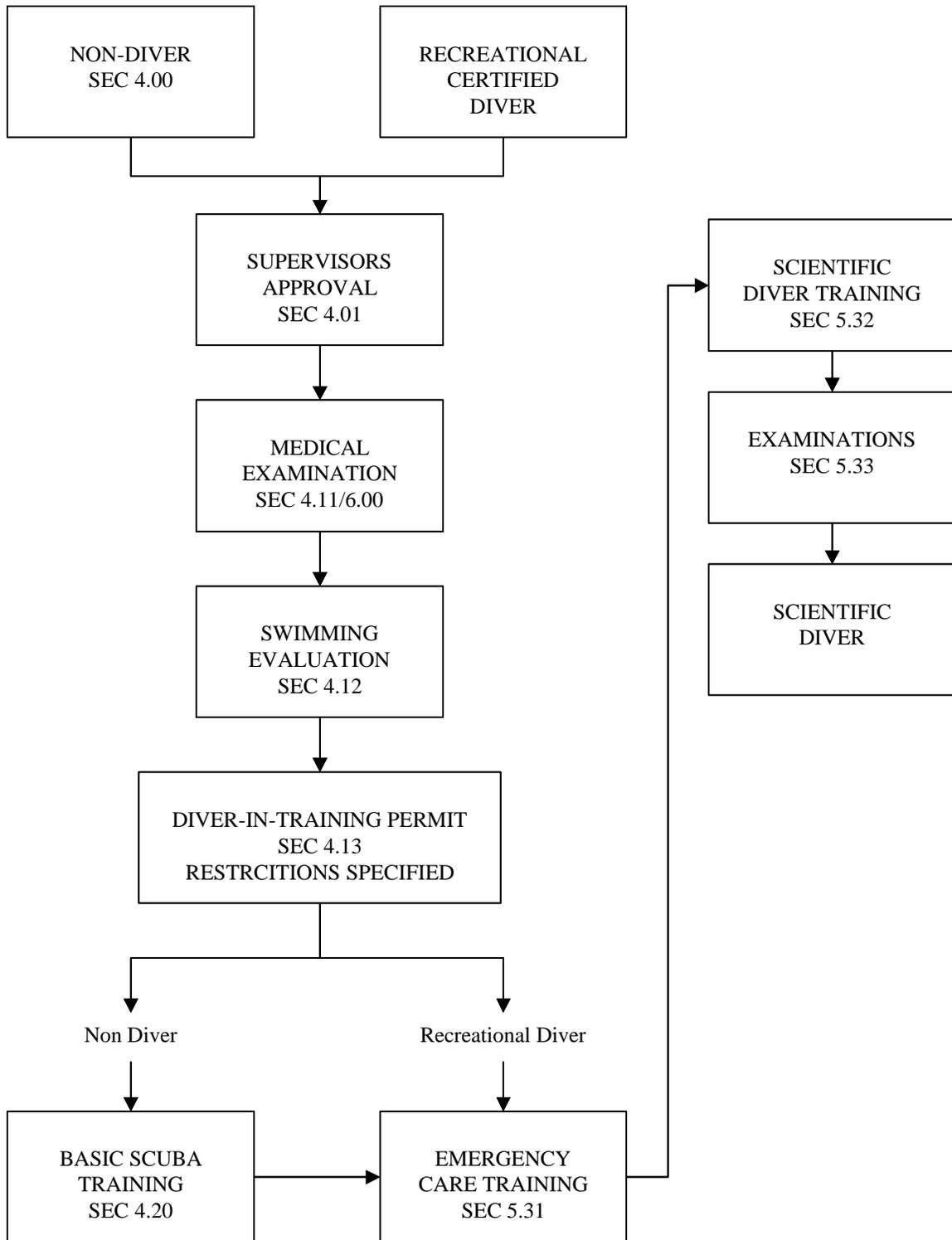
3.52.2 A log shall be maintained with the compressor showing operation, repair, overhaul, filter maintenance, and temperature adjustment for each compressor.

3.60 Air Quality Standards

Breathing air for scuba shall meet the following specifications as set forth by the Compressed Gas Association (CGA Pamphlet G-7.1) and referenced in OSHA 29 CFR 1910.134.

CGA Grade E	
Component	Maximum
Oxygen	20 - 22%/v
Carbon Monoxide	10 PPM/v
Carbon Dioxide	500 PPM/v
Condensed Hydrocarbons	5 mg/m ³
Water Vapor	NS
Objectionable Odors	None

SCIENTIFIC DIVER TRAINING FLOW CHART



SECTION 4.00 — ENTRY-LEVEL TRAINING REQUIREMENTS

This section describes training for the non-diver applicant, previously not certified for diving.

4.00 Supervisory Approval

A letter requesting your participation in the ADF&G scientific diving program (Appendix 14) must be obtained from either your divisional director or regional supervisor and submitted to the DSO through your LDSO, prior to participating in the diving program.

4.10 Evaluation

4.11 Medical Examination

The applicant for training shall be certified by a licensed medical doctor, preferably with hyperbaric medical training, to be medically qualified for diving before proceeding with the training as designated in Section 4.20 (see Section 6.00 and Appendices 1 through 6).

4.12 Swimming Evaluation

The applicant for training shall successfully perform the following tests, or their equivalent, in the presence of the DSO, or an examiner approved by the DSO. Candidates for certification who do not possess a training certificate from a nationally recognized training organization should arrange for this test to be included, if it is not already included, as part of their basic scuba training. If in the judgment of the DSO or LDSO a candidate has not demonstrated these or equivalent skills, he/she shall require a candidate to demonstrate the required swimming skills in the presence of, or an examiner approved by, the DSO or LDSO.

4.12.1 Swim underwater without swim aids for a distance of 25 yards without surfacing.

4.12.2 Swim 400 yards in less than 12 minutes without swim aids.

4.12.3 Tread water for 10 minutes, or 2 minutes without the use of hands, without swim aids.

4.12.4 Without the use of swim aids, transport another person of equal size a distance of 25 yards in the water.

4.13 Diver-In-Training Permit Level

The LDSO shall specify restrictions (Appendix 16) through a diver in training permit which allows an individual to participate in an approved training program, commensurate with the standards of this manual.

4.20 Scuba Training

Employees of the Department of Fish and Game shall complete an entry level scuba course from a training organization approved by the DCB. Such a course must include a minimum of 40 hours of instruction and five open-water dives. The Department of Fish and Game shall not teach an entry level scuba course. It is the responsibility of the individual diver to provide evidence that a course meets entry-level requirements. A LDSO or the DSO may require a candidate to demonstrate proficiency in the skills listed and/or knowledge

of the subject areas, including taking a refresher course, if a candidate has not been actively engaged in scuba diving for a period longer than one year.

4.21 Practical Training

At the completion of basic training, the trainee must satisfy the DSO, the LDSO, or the instructor of his/her ability to perform the following, as a minimum, in a pool or in sheltered water:

- 4.21.1 Enter water with full equipment.
- 4.21.2 Clear face mask.
- 4.21.3 Demonstrate air sharing, including both buddy breathing and the use of alternate air source, as both donor and recipient, with and without a face mask.
- 4.21.4 Demonstrate ability to alternate between snorkel and scuba while kicking.
- 4.21.5 Demonstrate understanding of underwater signs and signals.
- 4.21.6 Demonstrate simulated in-water mouth-to-mouth resuscitation.
- 4.21.7 Rescue and transport, as a diver, a passive simulated victim of an accident.
- 4.21.8 Demonstrate ability to remove and replace equipment while submerged.
- 4.21.9 Demonstrate watermanship ability which is acceptable to the instructor.

4.22 Written Examination

Before completing training, the trainee must pass a written examination that demonstrates knowledge of at least the following:

- 4.22.1 Function, care, use, and maintenance of diving equipment.
- 4.22.2 Physics and physiology of diving.
- 4.22.3 Diving regulations and precautions.
- 4.22.4 Near-shore currents and waves.
- 4.22.5 Dangerous marine animals.
- 4.22.6 Emergency procedures, including buoyant ascent and ascent by air sharing.
- 4.22.7 Currently accepted decompression procedures.
- 4.22.8 Proper use of dive tables.
- 4.22.9 Underwater communications.

4.22.10 Aspects of freshwater and altitude diving.

4.22.11 Hazards of breath-hold diving and ascents.

4.22.12 Planning and supervision of diving operations.

4.22.13 Diving hazards.

4.22.14 Cause, symptoms, treatment, and prevention of the following: near drowning, air embolism, carbon dioxide excess, squeezes, oxygen poisoning, nitrogen narcosis, exhaustion and panic, respiratory fatigue, motion sickness, decompression sickness, hypothermia, and hypoxia/anoxia.

4.23 Open Water Evaluation

The trainee must satisfy an instructor, approved by the DSO, or the LDSO, of his/her ability to perform at least the following in open water:

4.23.1 Surface dive to a depth of 10 feet in open water without scuba.

4.23.2 Demonstrate proficiency in air sharing, including both buddy breathing and the use of alternate air source, as both donor and receiver.

4.23.3 Enter and leave open water or surf, or leave and board a diving vessel, while wearing scuba gear.

4.23.4 Kick on the surface 400 yards while wearing scuba gear, but not breathing from the scuba unit.

4.23.5 Demonstrate judgment adequate for safe diving.

4.23.6 Demonstrate, where appropriate, the ability to maneuver efficiently in the environment, at and below the surface.

4.23.7 Complete a simulated emergency swimming ascent.

4.23.8 Demonstrate clearing of mask and regulator while submerged.

4.23.9 Demonstrate ability to achieve and maintain neutral buoyancy while submerged.

4.23.10 Demonstrate techniques of self-rescue and buddy rescue.

4.23.11 Navigate underwater.

4.23.12 Plan and execute a dive.

4.23.13 Successfully complete five open water dives for a minimum total time of three hours, of which 1-1/2 hours cumulative bottom time must be on scuba. No more than three training dives shall be made in any one day.

4.23.14 Demonstrate judgment adequate for safe diving.

SECTION 5.00 — SCIENTIFIC DIVER CERTIFICATION

5.10 Certification Types

5.10.1 Scientific Diver Certification.

This is a permit to dive, usable only while it is current and for the purpose intended.

5.10.2 Temporary Diver Permit.

This permit constitutes a waiver of the requirements of Section 5.00 and is issued only following a demonstration of the required proficiency in diving. It is valid only for a limited time, as determined by the DSO. This permit is not to be construed as a mechanism to circumvent existing standards set forth in this manual.

The DSO may waive requirements of Sections 5.30, 5.31 and 5.32 if the person in question has demonstrated proficiency in diving and can contribute measurably to a planned dive. A statement of the temporary diver's qualifications shall be submitted to the DSO as a part of the dive plan. Temporary permits shall be restricted to the planned diving operation and shall comply with all other policies, regulations, and standards of this manual, including medical requirements.

5.20 General Policy

ADF&G requires that no person shall engage in scientific diving unless that person is authorized by the department, pursuant to the provisions of this manual. The following are considered minimal standards for a scientific diver certification:

5.21 Prerequisites

Diver-In-Training Permit — This permit authorizes an individual to participate in an approved training program commensurate with the standards of this manual.

5.22 Eligibility

Only persons diving under ADF&G auspices are eligible to obtain certification.

5.23 Application

Applications for certification shall be made to the DSO or LDSO.

5.24 Medical Examination

Each applicant for diver certification shall submit a statement from a licensed physician, based on an approved medical examination, attesting to the applicant's fitness for diving, prior to initiating training or for certification (see Section 6.00 and Appendices 1–6).

5.30 Requirements For Scientific Diver Certification

Submission of documents and participation in aptitude examinations does not automatically result in certification. The applicant must convince the DSO or LDSO, as appropriate, and members of the DSB, that he/she is sufficiently skilled and proficient to be certified. The signature of the DSO or LDSO will acknowledge this skill. Any applicant who does not possess the necessary judgment, under diving conditions, for the safety of the diver and his/her partner, will be denied departmental scientific diving privileges. The DSO or LDSO may require additional training, or experience following completion of the minimum field practicum and training as he/she deems necessary prior to certifying a candidate as having successfully demonstrated the skills, knowledge and judgment necessary to safely participate in department dive operations. Minimum documentation and examinations required are as follows:

5.31 Documents

5.31.1 Application for certification.

5.31.2 Medical approval.

5.31.3 Proof of diver-in-training permit level or its equivalent.

5.31.4 Emergency Care Training.

The diver or diver-in-training must provide proof of training in the following:

- a. cardiopulmonary resuscitation (CPR) (must be current)
- b. emergency oxygen administration (must be current)
- c. first aid (must be current).

5.32 Advanced Training

The diver must complete additional theoretical aspects, and practical training beyond basic scuba training. To be certified as a scientific diver by ADF&G, an individual shall complete the NOAA working diver training or its equivalent prior to being certified. The following training may be substituted for the NOAA training, but it is the responsibility of the diver to convince the DSO, LDSO, or DSB that the training he/she has taken, or plans to take, will satisfy this requirement.

5.32.1 Safety: Complete instruction in CPR, First Aid and oxygen administration and possess current certificates of such training from recognized training agencies.

5.32.2 Dive Theory: Complete a minimum of 20 hours of instruction, and pass a written or oral examination in dive theory on each of the following topics: physics, physiology, equipment, environment and decompression-recompression theory.

5.32.3 Dive techniques: Complete a minimum of 36 hours of instruction (including 10 open water dives in a variety of dive sites, of which no more than 3 of these dives shall be made on one day), and pass a written or oral examination on dive techniques covering the following topics: safe diving practices, dry suit diving, navigation, limited visibility, search and salvage, deep, boat, rescue, and research diving.

5.33 Examinations

An applicant for certification as a department scientific diver shall pass an examination approved or conducted by the LDSO or DSO. Such an examination shall include, at a minimum:

5.33.1 Written examination for the certificate level.

5.33.2 Examination of equipment.

5.33.3 Open water check-out dives to appropriate depths with evaluation of the skills in Section 4.23, and Appendix 9, as required by the DSO or LDSO.

5.34 Field Practicum

Upon successful completion of formal advanced training, a diver in training shall complete a field practicum under the supervision of a LDSO, DSO, or dive master, and shall be accompanied by someone certified as a scientific diver. The field practicum may be conducted as part of ongoing dive operations conducted by ADF&G. As a minimum requirement, a diver in training shall complete at least 20 dives over a period of at least 10 days.

5.40 Depth Certifications

The diving certificate will authorize the holder to dive to the depth indicated on the certificate. Diving is not permitted beyond a depth of 130 feet.

5.41 Depth Certification Levels

5.41.1 Certification to 30 Foot Depth

This is the initial permit level, approved upon the successful completion of training outlined in Section 4.00.

5.41.2 Certification to 60 Foot Depth

A diver holding a certificate to 30 feet may be certified to a depth of 60 feet after successfully completing, under supervision, a minimum of 12 logged training dives to depths between 31 and 60 feet, for a minimum total time of four hours.

5.41.3 Certification to 100 Foot Depth

As policy, department scientific divers shall not normally dive, nor be certified to a depth, greater than 100 feet. A diver holding a 60 foot certificate may be certified to the 100 foot level after participating in an approved training program on deep diving, and after logging a minimum of 6 dives to 90-100 fsw. The signatures of two individuals who are certified to at least the same depth shall validate depth certification. A candidate for certification shall demonstrate proficiency in the planning of deep dives and the use of decompression tables.

5.41.4 Certification to 130 Foot Depth

A diver holding a 100 foot certificate may be certified to the 130 foot level. Logging a minimum of 6 dives to 120-130 fsw may certify a diver. The signatures of two individuals who are certified to at least the same depth shall validate depth certification. A candidate for certification shall demonstrate proficiency in the planning and special problems of deep dives, and the use of decompression tables to the LDSO or DSO.

5.42 Progression to Next Depth Level

A certified diver diving under department auspices may exceed his/her depth certification only if accompanied by a diver certified to a greater depth. Under these circumstances the diver may exceed his/her depth limit by one step.

5.50 Continuation of Certificate

5.51 Minimum Dive Activity to Maintain Certification

During any 12 month period, each certified scientific diver must log a minimum of 12 dives. To maintain proficiency, at least two dives must be performed during each two-month period. Each dive to meet this minimum requirement must have a minimum bottom time of 20 minutes. Divers are encouraged to dive as frequently as possible. At least one dive must be logged near the maximum depth of the diver's certification during each six-month period. Failure to meet these minimum requirements may be cause for revocation or restriction of certification and is subject to a checkout dive by the LDSO or his designee. The checkout dive must occur prior to the start of any survey and Appendix 9 must be completed and submitted to the LDSO. Personal, recreational diving can be included in the minimum dive requirement, and is encouraged.

5.52 Re-qualification of Depth Certificate

Once the initial certification requirements of Section 5.31 – 5.34 are met, divers whose depth certification has lapsed due to lack of activity may be requalified by demonstrating to the LDSO or DSO that he/she is competent to engage in diving to the planned depth.

5.53 Medical Examination

All certified scientific divers shall pass a medical examination at the intervals specified in Section 6.12. After each major illness or injury, a certified scientific diver shall receive clearance to return to diving from a physician before resuming diving activities.

5.54 Periodic Training

5.54.1 As a minimum, all certified scientific divers shall remain current in cardiopulmonary resuscitation (CPR), emergency oxygen administration, and first aid for diving accidents. NOAA working Diver course or equivalent) is required once every five years.

5.54.2 Periodic refresher training via NOAA working-diver refresher course or its equivalent at a minimum of 5-year intervals.

5.60 Revocation of Certification

A diving certificate may be revoked, or restricted, for cause by the DSO, LDSO, DSB or by the employee's supervisor. Violations of regulations set forth in this manual, or other applicable regulations of the State of Alaska not in conflict with this manual, may be considered cause for revoking a certificate. The DSO, LDSO, DSB, or the employee's supervisor shall inform the diver in writing of the reason(s) for revocation or restriction. The diver will be given the opportunity to present his/her case, in writing, to the DSB for reconsideration and/or recertification. All such written statements and requests, as identified in this section, are formal documents which will become part of the diver's permanent file.

5.70 Recertification

If a diver's ADF&G authorization expires or is revoked or restricted, he/she may be reauthorized after complying with such conditions as the DSO, LDSO, or the DSB may impose. The diver shall be given an opportunity to present his/her case to the DSB before conditions for recertification are stipulated.

Recognizing that many department dive activities are seasonal in nature and that it is difficult for many divers to fulfill the requirement for diving as described in Section 5.51, the DSO or LDSO who serves each division or region may establish and conduct (within each region or division as appropriate) using qualified instructors, an annual refresher course in dive theory and techniques. Participation in such refresher courses may be required for recertification for individuals who have allowed their certification to lapse.

5.80 Dive Master Certification

Department employees who are certified scientific divers and who occupy a supervisory position, or who's job description requires a substantial amount of diving, shall be eligible for training as a department dive master. Training as a department dive master shall require the approval of the LDSO or DSO, and follow other required department training procedures.

Dive masters occupy a position of *leadership* and *responsibility* in the department. Generally stated, that responsibility is to plan and conduct *efficient* and *safe* dive operations in support of the department's mission. In the event of an emergency, dive masters are responsible for *deciding* and *implementing* the appropriate emergency response.

To accomplish this mission department dive masters should be:

1. Among the best trained and most competent in diving theories, equipment, and skills;
2. Prepared to identify and respond to emergency situations;
3. Experienced in, and show good judgment in, the field conditions they operate;
4. Committed to the conduct of safe and efficient dive operations;
5. Able to plan, monitor and execute a dive plan that is safe and efficient; and,
6. Mentors for staff new to diving and a resource for experienced staff.

The LDSO, in consultation with the DSO, shall approve specific courses and training prior to being certified as a department dive master; preferred training is the NOAA Dive Master course or its equivalent. It is the responsibility of the diver to convince the DSO, LDSO, or DSB that the training he/she has taken, or plans to take, will satisfy this requirement.

5.90 Instructor Level and Other Certifications

Recognizing the need for ongoing and continuous education, the cost savings gained for such training to be conducted “in-house,” and the value of having well trained divers participating in department operations, the DSB pre-approves training for qualified individuals in the following fields:

1. Scuba Instructor
2. Assistant Instructor
3. Visual Tank Inspection
4. Emergency Medical Technician
5. Oxygen Administration Instructor
6. Cardiopulmonary Resuscitation Instructor
7. First Aid Instructor
8. Regulator and Dry Suit Maintenance
9. Nitrox Instructor
10. AED Instructor

Department certification will be based on need. Individuals will be authorized to teach “in-house” courses only after successfully completing training from a recognized agency and complying with the provisions of this manual. Approval must be obtained, through your supervisor and from your local LDSO prior to participating in instructor level courses.

5.100 Continuing Education

With approval through your supervisor, all ADF&G divers are strongly encouraged to participate in continuing education courses. Suggested classes pre-approved by the DSB include:

1. Dive Rescue
2. Emergency Medical Technician (all levels)
3. Life Guard Training
4. Visual Tank Inspection
5. Gear Servicing and Maintenance
6. Compressor Maintenance and Operation
7. Dive Master
8. Assistant Instructor
9. Altitude Diving
10. Underwater Photography
11. Enhanced Air (Nitrox) Diving
12. Closed and Semi-Closed Circuit SCUBA (Rebreathers) (see Section 7.50)
13. Skiff operation and maintenance
14. Decompression Diving
15. Surface Supplied and Hookah Diving
16. Blue Water Diving (see Section 7.70)
17. Ice Diving (see Section 7.80)
18. Overhead Environments (see Section 7.90)
19. Photography
20. Trimix
21. AED
22. Diving Medical Technician (DMT)
23. NOAA working diver refresher training, or its equivalent

SECTION 6.00 — MEDICAL STANDARDS

6.10 Medical Requirements

6.11 General

6.11.1 Department dive team members shall have passed a current diving physical examination and have been declared by the examining physician to be fit to engage in diving activities as may be limited or restricted in the medical evaluation report.

6.11.2 All medical evaluations required by this standard shall be performed by, or under the direction of, a licensed medical doctor of the applicant diver's choice. ADF&G encourages divers to seek medical evaluations from physicians trained in, and familiar with, the special problems of hyperbaric conditions and diving.

6.11.3 The diver should be free of any chronic disabling disease and be free of any conditions contained in the list of conditions for which restrictions from diving are generally recommended. (Appendix 1)

6.12 Frequency of Medical Evaluations

Medical evaluation shall be completed:

6.12.1 Before a diver may begin diving, unless an equivalent initial medical evaluation has been given within the preceding two years (one year if over age 40), ADF&G has obtained a completed copy of the results of that examination, and those results have been reviewed and found satisfactory by ADF&G.

6.12.2 Thereafter, at a minimum of two-year intervals up to age 40 and at a minimum annually after the age of 40.

6.12.3 After any major injury or illness, or any condition requiring hospitalization, requires that the diver undergo a physical examination and obtains clearance to return to diving from a physician. If the injury or illness is pressure related then the clearance to return to diving must come from a physician trained in diving or hyperbaric medicine.

6.13. Information Provided Examining Physician

ADF&G shall provide a copy of the medical evaluation requirements of this standard to the examining physician (Appendices 1, 2, and 3).

6.14 Content of Medical Evaluations

Medical examinations conducted initially and at the intervals specified in Section 6.12 shall consist of the following:

6.14.1 Applicant agreement for release of medical information to the DSO, LDSO, and the DSB (see Appendix 2).

6.14.2 Medical history (see Appendix 3)

6.14.3 Diving physical examination (Section 6.15 and Appendix 2).

6.14.4 Any additional tests the physician may consider necessary.

6.15 Conditions for which restriction from diving is recommended (adapted from Davis, 1986) (see Appendix 1)

6.16 Laboratory Requirements for Diving Medical Examination:

6.16.1 Initial examination, first examination over age 40 and five-year intervals thereafter:

Medical History

Chest X-ray

Resting EKG

Pulmonary function

Audiogram

Visual acuity

Complete blood count (CBC)

Blood chemistry

Urinalysis

Any further tests deemed necessary by the physician to qualify the patient for scuba diving.

6.16.2 Periodic re-examination (every two years up to age 40, every year after age 40):

Medical History

Pulmonary function

Audiogram

Visual acuity

Complete blood count (CBC)

Blood chemistry

Urinalysis

Any further tests deemed necessary by the physician to qualify the patient for scuba diving.

6.17 Physician's Written Report

6.17.1 After any medical examination relating to the individual's fitness to dive, ADF&G shall obtain a written report prepared by the examining physician, which shall contain the examining physician's opinion of the individual's fitness to dive, including any recommended restrictions or limitations. This may be reviewed by the DCB.

6.17.2 ADF&G shall make a copy of the physician's written report available to the individual.

SECTION 7.00 — OTHER DIVING TECHNOLOGY

Certain types of diving, some of which are listed below, require equipment or procedures which necessitate additional training because of their complexity or increased risk. It is the responsibility of the individual diver to provide evidence that such a course meets the DSB requirements. Specific skill requirements,

academic topics, and training may be determined necessary by the DSB on a case-by-case basis, depending on a departmental program mission. Divers shall comply with all scuba diving procedures in this manual and any additional procedures specified by the DSB.

7.10 Staged Decompression Diving

No diver shall plan or conduct staged decompression dives without prior approval of the DSB. Prior to engaging in staged decompression diving, all divers and tenders shall complete a training program approved by the DSB in the use and special considerations of staged decompression diving.

7.20 Saturation Diving

Saturation diving is not allowed.

7.30 Hookah

7.30.1 Divers using the hookah mode shall be equipped with a diver-carried independent reserve breathing gas supply.

7.30.2 Each hookah diver shall be hose-tended by a separate dive-team member while in the water.

7.30.3 The hookah breathing gas supply shall be sufficient to support all hookah divers in the water for the duration of the planned dive, including decompression.

7.30.4. Prior to engaging in diving with hookah gear, all divers and tenders shall complete a training program approved by the DSB in the use and special considerations of hookah gear.

7.40 Surface Supplied Diving

Surface supplied divers shall comply with all scuba diving procedures in this manual (except Section 2.31).

7.40.1 Divers using the surface supplied mode shall be equipped with a diver-carried independent reserve breathing gas supply.

7.40.2 Each surface supplied diver shall be hose tended by a separate dive team member while in the water.

7.40.3 Divers using the surface supplied mode shall maintain voice communication with the surface tender.

7.40.4 The surface supplied breathing gas supply shall be sufficient to support all surface supplied divers in the water for the duration of the planned dive, including decompression.

7.40.5 During surface supplied diving operations when only one diver is in the water, there must be a standby diver in attendance at the dive location and capable of rendering immediate assistance.

7.40.6 Surface supplied diving will adhere to the depth limits outlined in Sections 5.40 – 5.42.

7.40.7 Prior to engaging in surface supplied diving, all divers and tenders shall complete a training program, approved by the DSB, in the use and special considerations of the specific equipment used in the dive operation.

7.50 Closed and Semi-Closed Circuit Scuba (Rebreathers)

Prior to using rebreathers, the Regional Supervisor or Division director, or his/her designee, must certify that such diving is essential to ADF&G's mission. Only after consulting with the DSO or LDSO to determine if reasonable alternatives exist, other than using department divers, and after completing a DSB approved training program in the use and special considerations of rebreathers, may rebreather diving be performed.

Closed and semi-closed circuit scuba (rebreathers) shall meet the following requirements:

7.50.1 Oxygen partial pressure in the breathing gas shall not exceed values approved by ADF&G's DSB. The generally accepted maximum value is 1.4 atmospheres pPO₂ at depths greater than 25 fsw (7.6 msw).

7.50.2 Chemicals used for the absorption of carbon dioxide shall be kept in a cool, dry location in a sealed container until required for use.

7.50.3 The designated person-in-charge shall determine that the carbon dioxide absorption canister is used in accordance with the manufacturer's instructions.

7.50.4 Closed and semi-closed diving equipment will not be used at a depth greater than that recommended by the manufacturer of the equipment.

7.60 Mixed Gas Diving

7.60.1 Nitrox diving

Divers planning to use enriched air (Nitrox) scuba diving must use the following guidelines which are available through AAUS: "Guidelines for Scientific Nitrox Diving and Nitrox Diver Certification," American Academy of Underwater Sciences, 1991. Prior to engaging in Nitrox diving, all divers and tenders shall complete a training program, approved by the DSB, in the use and special considerations of Nitrox diving.

7.70 Blue Water Diving

Blue water diving is defined as diving in open water where the bottom is generally >200 feet deep. It requires special training and the use of multiple-tethered diving techniques. Specific guidelines that should be followed are outlined in "Blue Water Diving Guidelines" (California Sea Grant Publ. No. T-CSGCP-014). Prior to blue water diving, the Regional Supervisor or Division director, or his/her designee, must certify that such diving is essential to ADF&G's mission. Only after consulting with the DSO or LDSO to determine if reasonable alternatives exist, other than using department divers, may blue water diving be performed.

7.80 Ice Diving

Divers planning to dive under ice should use the following: “Guidelines for Conduct of Research Diving,” National Science Foundation, Division of Polar Programs, 1990. Prior to ice diving, the regional supervisor or division director, or his/her designee, must certify that such diving is essential to ADF&G’s mission. Only after consulting with the DSO or LDSO to determine if reasonable alternatives exist, other than using department divers, may ice diving be performed.

7.90 Overhead Environments

Divers shall not enter enclosed or confined spaces that are too small for at least two divers unless the mission cannot be successfully completed. Prior to entering enclosed or confined spaces, the Regional Supervisor or Division director, or his/her designee, must certify that such diving is essential to ADF&G’s mission. Only after consulting with the DSO or LDSO to determine if reasonable alternatives exist, other than using department divers, may enclosed or confined spaces be entered. Also prior to diving in an overhead environment, all divers and tenders shall complete a training program, approved by the DSB, in the special considerations of overhead environments. When it is necessary to enter such spaces, a diver shall be stationed at the underwater entry point and an orientation line shall be used.

APPENDICES

Appendix 1. Diving medical exam overview for the examining physician.

TO THE EXAMINING PHYSICIAN:

This person, _____, requires a medical examination to assess his/her fitness for certification as a Scientific Diver for the Alaska Department of Fish and Game. His/her answers on the Diving Medical History Form (attached), may indicate potential health or safety risks as noted. Your evaluation is requested on the attached scuba Diving Fitness Medical Evaluation Report. If you have questions about diving medicine, you may wish to consult one of the references on the attached list or contact one of the physicians with expertise in diving medicine whose names and phone numbers appear on an attached list. Please contact the undersigned Diving Safety Officer if you have any questions or concerns about diving medicine or ADF&G's standards. Thank you for your assistance.

Diving Safety Officer	Date
Kyle Hebert	(907) 772 5237
Printed Name	Phone Number

Scuba and other modes of compressed-gas diving can be strenuous and hazardous. A special risk is present if the middle ear, sinuses, or lung segments do not readily equalize air pressure changes. The most common cause of distress is eustachian insufficiency. Most fatalities involve deficiencies in prudence, judgment, emotional stability, or physical fitness. Please consult the following list of conditions which usually restrict candidates from diving.

(Adapted from Davis 1986:47–50, bracketed numbers are pages in Davis)

1. Tympanic membrane perforation or aeration tube [7]
2. Inability to auto-inflate the middle ears [6, 7, 8]
3. External ear exostoses or osteomas adequate to prevent external ear canal pressure equilibration [4]
4. Meniere's Disease or other chronic vertiginous conditions, status post-surgery, such as subarachnoid endolymphatic shunt for Meniere's Disease [11]
5. Stapedectomy and middle ear prosthesis [9]
6. Chronic mastoiditis or mastoid fistula [5]
7. Any oral or maxillofacial deformity that interferes with the retention of the regulator mouthpiece [43]
8. Corrected near visual acuity not adequate to see tank pressure gauge, watch, decompression tables, and compass underwater. Uncorrected visual acuity not adequate to see the diving buddy or locate the boat in case corrective lenses are lost underwater [13]
9. Radial keratotomy or other recent ocular surgery [14]
10. Claustrophobia of a degree to predispose to panic [15, 16]
11. Suicidal ideation [16]
12. Significant anxiety states [16]
13. Psychosis [18]
14. Severe depression [16]
15. Manic states [16]
16. Alcoholism [19, 20]

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17. Mood-altering drug use [19, 20]
18. Improper motivation for diving [16, 17, 18]
19. Episodic loss of consciousness [1, 22]
20. History of seizure. History of seizure in early childhood must be evaluated individually [21]
21. Migraine [20]
22. History of cerebrovascular accident or transient ischemic attack [23]
23. History of spinal cord trauma with neurologic deficit - whether fully recovered or not [23]
24. Any degenerative or demyelinating CNS process [25]
25. Brain tumor with or without surgery [24]
26. Intracranial aneurysm or other vascular malformation [24]
27. History of neurological decompression sickness with residual deficit [23, 24]
28. Head injury with sequelae [21]
29. History of intracranial surgery [24]
30. Sickle cell disease [34]
31. Polycythemia or leukemia [34]
32. Unexplained anemia [34]
33. History of myocardial infarction [28, 29, 20]
34. Angina or other evidence of coronary artery disease [29]
35. Unrepaired cardiac septal defects [32]
36. Aortic stenosis or mitral stenosis [32]
37. Complete heart block [31]
38. Fixed second-degree heart block [31]
39. Exercised-induced tachyarrhythmias [31, 32]
40. Wolf-Parkinson-White (WPW) Syndrome with paroxysmal atrial tachycardia or syncope [31]
41. Fixed-rate pacemakers [33]
42. Any drugs which inhibit the normal cardiovascular response to exercise tolerance [31]
43. Peripheral vascular disease, arterial or venous, severe enough to limit exercise tolerance [33, 41]
44. Hypertension with end-organ finding - retinal, cardiac, renal or vascular [30]
45. History of spontaneous pneumothorax [36]
46. Bronchial asthma. History of childhood asthma requires special studies [7,35]
47. Exercise or cold air-induced asthma [36, 37]
48. X-ray evidence of pulmonary blebs, bullae, or cysts [36, 37]
49. Chronic obstructive pulmonary disease [37]
50. Insulin-dependent diabetes mellitus. Diet or oral medication-controlled diabetes mellitus if there is a history of hypoglycemic episodes [38]
51. Any abdominal wall hernia with potential for gas-trapping until surgically corrected [41]
52. Paraesophageal or incarcerated sliding hiatal hernia [39]
53. Sliding hiatus hernia if symptomatic due to reflux esophagitis [39]
54. Pregnancy [1, 45]
55. Osteonecrosis. A history consistent with a high risk of dysbaric osteonecrosis
56. Any condition requiring ingestion of the following medication: antihistamines, bronchodilators, steroids, barbiturates, phenytoin, mood-altering drugs, insulin

Attachments: Medical Evaluation of Fitness for Scuba Diving Report
 Diving Medical History Form
 Question Evaluations for Diving Medical History Form
 Recommended Physicians with Expertise in Diving/Undersea Medicine
 References on Diving Medicine

Appendix 2. Medical evaluation of fitness for scuba diving report.

Name of Applicant (Print or Type)	Date(Mo/Day/Year)
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To The PHYSICIAN:

This person is an applicant for training or is presently certified to engage in scuba diving. This is an activity which puts unusual stress on the individual in several ways. Your opinion on the applicant's medical fitness is requested. Scuba diving requires heavy exertion. The diver must be free of cardiovascular and respiratory disease. An absolute requirement is the ability of the lungs, middle ear, and sinuses to equalize pressure. Any condition that risks the loss of consciousness should disqualify the applicant.

TESTS: Please initial that the following tests were completed.

Initial Examination, first over age 40,
5-year intervals thereafter.

Re-examination

_____ Medical History

_____ Medical History

_____ Chest x-ray

_____ Resting EKG

_____ Pulmonary function

_____ Pulmonary function

_____ Audiogram

_____ Audiogram

_____ Visual acuity

_____ Visual acuity

_____ Complete blood count (CBC)

_____ Complete blood count (CBC)

_____ Blood chemistry

_____ Blood chemistry

_____ Urinalysis

_____ Urinalysis

RECOMMENDATION:

APPROVAL. I find no medical condition(s) which I consider incompatible with diving.

RESTRICTED ACTIVITY APPROVAL. The applicant may dive in certain circumstances as described in REMARKS.

FURTHER TESTING REQUIRED. I have encountered a potential contraindication to diving. Additional medical tests must be performed before a final assessment can be made. See REMARKS.

REJECT. This applicant has medical condition(s) which, in my opinion, clearly would constitute unacceptable hazards to health and safety in diving. See REMARKS.

REMARKS:

I have discussed the patient's medical condition(s) which would not seriously interfere with diving but which may seriously compromise subsequent health. The patient understands the nature of the hazards and the risks involved in diving with these defects.

M.D

_____ Date _____ Signature _____

Name (Print or Type)

Address

Telephone Number

My familiarity with applicant is:

- With this exam only
- Regular Physician for _____ years
- Other (describe) _____

My familiarity with diving medicine:

- On attached list of physicians
- Other (describe) _____

APPLICANT'S RELEASE OF MEDICAL INFORMATION FORM

I authorize the release of this information and all medical information subsequently acquired in association with my diving to the _____ Diving Safety Officer and Diving Control Board or their designee at (place) _____ on (date)_____.

Signature of Applicant _____

Appendix 3. Diving medical history form. (To be completed by applicant-diver)

Name _____ Sex _____ Age _____ Wt. _____ Ht. _____

Sponsor _____ Date ____/____/____
 (Dept./Project/Program, etc.) (Mo/Day/Yr)

TO THE APPLICANT:

Scuba diving makes considerable demands on your physical and emotional condition. Diving with particular defects amounts to asking for trouble not only for yourself, but to anyone coming to your aid if you get into difficulty in the water. Therefore, it is prudent to meet certain medical and physical requirements before beginning a diving or training program.

Your answers to the questions are more important, in many instances, in determining your fitness than what the physician may see, hear or feel when you are examined. Obviously, you should give accurate information or the medical screening procedure becomes useless.

This form shall be kept confidential. If you believe any question amounts to invasion of your privacy, you may elect to omit an answer, provided that you shall subsequently discuss that matter with your own physician and he/she must then indicate, in writing, that you have done so and that no health hazard exists.

Should your answers indicate a condition which might make diving hazardous, you will be asked to review the matter with your physician. In such instances, his/her written authorization will be required in order for further consideration to be given to your application. If your physician concludes that diving would involve undue risk for you, remember that he/she is concerned only with your well-being and safety. Respect the advice and the intent of this medical history form.

	Yes	No	Please indicate whether or not the following apply to you	Comments
1	<input type="checkbox"/>	<input type="checkbox"/>	Convulsions, seizures, or epilepsy	
2	<input type="checkbox"/>	<input type="checkbox"/>	Fainting spells or dizziness	
3	<input type="checkbox"/>	<input type="checkbox"/>	Been addicted to drugs	
4	<input type="checkbox"/>	<input type="checkbox"/>	Diabetes	
5	<input type="checkbox"/>	<input type="checkbox"/>	Motion sickness or sea/air sickness	
6	<input type="checkbox"/>	<input type="checkbox"/>	Claustrophobia	
7	<input type="checkbox"/>	<input type="checkbox"/>	Mental disorder or nervous breakdown	
8	<input type="checkbox"/>	<input type="checkbox"/>	Are you pregnant?	
9	<input type="checkbox"/>	<input type="checkbox"/>	Do you suffer from menstrual problems?	
10	<input type="checkbox"/>	<input type="checkbox"/>	Anxiety spells or hyperventilation	
11	<input type="checkbox"/>	<input type="checkbox"/>	Frequent sour stomachs, nervous stomachs or vomiting spells	
12	<input type="checkbox"/>	<input type="checkbox"/>	Had a major operation	
13	<input type="checkbox"/>	<input type="checkbox"/>	Presently being treated by a physician	
14	<input type="checkbox"/>	<input type="checkbox"/>	Taking any medication regularly (even nonprescription)	
15	<input type="checkbox"/>	<input type="checkbox"/>	Been rejected or restricted from sports	
16	<input type="checkbox"/>	<input type="checkbox"/>	Headaches (frequent and severe)	
17	<input type="checkbox"/>	<input type="checkbox"/>	Wear dental plates	
18	<input type="checkbox"/>	<input type="checkbox"/>	Wear glasses or contact lenses	
19	<input type="checkbox"/>	<input type="checkbox"/>	Bleeding disorders	
20	<input type="checkbox"/>	<input type="checkbox"/>	Alcoholism	
21	<input type="checkbox"/>	<input type="checkbox"/>	Any Problems related to diving	
22	<input type="checkbox"/>	<input type="checkbox"/>	Nervous tension or emotional problems	
23	<input type="checkbox"/>	<input type="checkbox"/>	Take tranquilizers	
24	<input type="checkbox"/>	<input type="checkbox"/>	Perforated ear drums	
25	<input type="checkbox"/>	<input type="checkbox"/>	Hay fever	
26	<input type="checkbox"/>	<input type="checkbox"/>	Frequent sinus trouble, frequent drainage from the nose, post-nasal drip, or stuffy nose	
27	<input type="checkbox"/>	<input type="checkbox"/>	Frequent earaches	
28	<input type="checkbox"/>	<input type="checkbox"/>	Drainage from the ears	
29	<input type="checkbox"/>	<input type="checkbox"/>	Difficulty with your ears in airplanes or on mountains	
30	<input type="checkbox"/>	<input type="checkbox"/>	Ear surgery	

	Yes	No	Please indicate whether or not the following apply to you	Comments
31	<input type="checkbox"/>	<input type="checkbox"/>	Ringling in your ears	
32	<input type="checkbox"/>	<input type="checkbox"/>	Frequent dizzy spells	
33	<input type="checkbox"/>	<input type="checkbox"/>	Hearing problems	
34	<input type="checkbox"/>	<input type="checkbox"/>	Trouble equalizing pressure in your ears	
35	<input type="checkbox"/>	<input type="checkbox"/>	Asthma	
36	<input type="checkbox"/>	<input type="checkbox"/>	Wheezing attacks	
37	<input type="checkbox"/>	<input type="checkbox"/>	Cough (chronic or recurrent)	
38	<input type="checkbox"/>	<input type="checkbox"/>	Frequently raise sputum	
39	<input type="checkbox"/>	<input type="checkbox"/>	Pleurisy	
40	<input type="checkbox"/>	<input type="checkbox"/>	Collapsed lung (pneumothorax)	
41	<input type="checkbox"/>	<input type="checkbox"/>	Lung cysts	
42	<input type="checkbox"/>	<input type="checkbox"/>	Pneumonia	
43	<input type="checkbox"/>	<input type="checkbox"/>	Tuberculosis	
44	<input type="checkbox"/>	<input type="checkbox"/>	Shortness of breath	
45	<input type="checkbox"/>	<input type="checkbox"/>	Lung problem or abnormality	
46	<input type="checkbox"/>	<input type="checkbox"/>	Spit blood	
47	<input type="checkbox"/>	<input type="checkbox"/>	Breathing difficulty after eating particular foods, after exposure to particular pollens or animals	
48	<input type="checkbox"/>	<input type="checkbox"/>	Are you subject to bronchitis?	
49	<input type="checkbox"/>	<input type="checkbox"/>	Subcutaneous emphysema (air under the skin)	
50	<input type="checkbox"/>	<input type="checkbox"/>	Air embolism after diving	
51	<input type="checkbox"/>	<input type="checkbox"/>	Decompression sickness	
52	<input type="checkbox"/>	<input type="checkbox"/>	Rheumatic fever	
53	<input type="checkbox"/>	<input type="checkbox"/>	Scarlet fever	
54	<input type="checkbox"/>	<input type="checkbox"/>	Heart murmur	
55	<input type="checkbox"/>	<input type="checkbox"/>	Large heart	
56	<input type="checkbox"/>	<input type="checkbox"/>	High blood pressure	
57	<input type="checkbox"/>	<input type="checkbox"/>	Angina (heart pains or pressure in the chest)	
58	<input type="checkbox"/>	<input type="checkbox"/>	Heart attack	
59	<input type="checkbox"/>	<input type="checkbox"/>	Low blood pressure	
60	<input type="checkbox"/>	<input type="checkbox"/>	Recurrent or persistent swelling of the legs	
61	<input type="checkbox"/>	<input type="checkbox"/>	Pounding, rapid heartbeat, or palpitations	
62	<input type="checkbox"/>	<input type="checkbox"/>	Easily fatigued or short of breath	
63	<input type="checkbox"/>	<input type="checkbox"/>	Abnormal EKG	
64	<input type="checkbox"/>	<input type="checkbox"/>	Joint problems, dislocations, or arthritis	
65	<input type="checkbox"/>	<input type="checkbox"/>	Back trouble or back injuries	
66	<input type="checkbox"/>	<input type="checkbox"/>	Ruptured or slipped disk	
67	<input type="checkbox"/>	<input type="checkbox"/>	Limiting physical handicaps	
68	<input type="checkbox"/>	<input type="checkbox"/>	Muscle cramps	
69	<input type="checkbox"/>	<input type="checkbox"/>	Varicose veins	
70	<input type="checkbox"/>	<input type="checkbox"/>	Amputations	
71	<input type="checkbox"/>	<input type="checkbox"/>	Head injury causing unconsciousness	
72	<input type="checkbox"/>	<input type="checkbox"/>	Paralysis	
73	<input type="checkbox"/>	<input type="checkbox"/>	Have you ever had an adverse reaction to medication?	
74	<input type="checkbox"/>	<input type="checkbox"/>	Do you smoke?	
75	<input type="checkbox"/>	<input type="checkbox"/>	Have you ever had any other medical problems not listed? If so, please list or describe below;	

I certify that the above answers and information represent an accurate and complete description of my medical history.

Signature Date

Appendix 4. Medical history questions evaluation form.

(Answer Screening Aid)

1 - A	21 - B	41 - A	61 - B
2 - B	22 - B	42 - B	62 - B
3 - B	23 - B	43 - B	63 - B
4 - B	24 - C	44 - B	64 - B
5 - C	25 - B	45 - B	65 - B
6 - B	26 - B	46 - B	66 - B
7 - B	27 - B	47 - B	67 - B
8 - A	28 - B	48 - B	68 - B
9 - B	29 - B	49 - B	69 - B
10 - B	30 - B	50 - B	70 - B
11 - B	31 - B	51 - B	71 - B
12 - B	32 - B	52 - B	72 - B
13 - B	33 - B	53 - B	73 - C
14 - B	34 - C	54 - B	74 - C
15 - B	35 - B	55 - B	75 - B
16 - B	36 - B	56 - B	
17 - C	37 - B	57 - A	
18 - B	38 - B	58 - B	
19 - B	39 - B	59 - B	
20 - B	40 - B	60 - B	

When a “Yes” answer is checked:

A = Absolute contraindication to diving;

B = Relative contraindication to diving, requires careful review by physician;

C = Of interest, not a contraindication.

Appendix 5. Recommended physicians with expertise in diving medicine.

List of local Medical Doctors that have training and expertise in diving or undersea medicine:

1 Dr. William Palmer

· _____
Name

Juneau Medical Center, 9309 Glacier Hwy, Bldg. B, Suite
301, Juneau, AK 99801

Address

907-586-1895 — Bartlett Hospital, Juneau 586-2611

Telephone

2 Dr. Aric Ludwig

· _____
Name

Bartlett Hospital, Juneau

Address

Bartlett Hospital 586-2611

Telephone

3 Dr. Donald Lehmann

· _____
Name

Sitka Medical Center, 700 Katlian St., Sitka, AK 99835

Address

907-747-5861

Telephone

4 Dr. Hunter Judkins

· _____
Name

1001 Noble St., Fairbanks, AK 99701

Address

(907) 459-3500

Telephone

Appendix 6. Selected references in diving medicine.

DIVING MEDICINE, 1990. A. Bove and J. Davis. W. B. Saunders Company, Philadelphia.

DIVING AND SUBAQUATIC MEDICINE, Third Edition, 1992. C. Edmonds, C. Lowery and J. Pennefather. Butterworth-Heinemann Ltd. Oxford. (Available from Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100).

MEDICAL EXAMINATION OF SPORT SCUBA DIVERS, Jefferson Davis, M.D. (ed.). Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100.

NOAA DIVING MANUAL, NOAA. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

SCUBA DIVING IN SAFETY AND HEALTH, C.W. Deuker. Madison Publishing Associates, Diving Safety Digest, P.O. Box 2735, Menlo Park, CA 94026.

THE PHYSICIAN'S GUIDE TO DIVING MEDICINE, C. W. Shilling, C. B. Carlston and R. A. Mathias. Plenum Press, New York, NY (Available through the Undersea and Hyperbaric Medical Association, Bethesda, MD).

U.S. NAVY DIVING MANUAL. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

Air sharing — The sharing of an air supply between divers.

Bottom Time — The total elapsed time measured in minutes from the time when the diver leaves the surface in descent to the time that the diver begins a direct ascent to the surface.

Breath-hold Diving — A diving mode in which the diver uses no self-contained or surface-supplied air or oxygen supply.

Buddy Breathing — The sharing of a single air source between divers.

Buddy Diver — Second member of the dive team.

Buddy System — Two comparably equipped scuba divers in the water in constant communication.

Buoyant Ascent — An ascent made using some form of positive buoyancy.

Burst Pressure — The pressure at which a pressure containment device would fail structurally.

Certified Diver — A diver who holds a recognized valid certification from an organizational member or recognized certifying agency.

Controlled Ascent — Any one of several kinds of ascents including normal, swimming, and air sharing ascents where the diver(s) maintain control so a pause or stop can be made during the ascent.

Cylinder — A pressure vessel for the storage of gases.

Decompression Chamber — A pressure vessel for human occupancy. Also called a hyperbaric chamber or recompression chamber.

Decompression Sickness — A condition with a variety of symptoms which may result from gas and bubbles in the tissues of divers after pressure reduction.

Decompression Table — A profile or set of profiles of depth—time relationships for ascent rates and breathing mixtures to be followed after a specific depth—time exposure or exposures. (Also called dive tables.)

Dive — A descent into the water, an underwater diving activity utilizing compressed gas, an ascent, and return to the surface.

Dive Computer — A microprocessor based device which computes a diver's theoretical decompression status, in real time, by using pressure (depth) and time as input to a decompression model, or set of decompression tables, programmed into the device.

Dive Location — A surface or vessel from which a diving operation is conducted.

Dive Site — The physical location of a diver during a dive.

Diver — An individual in the water who uses apparatus, including snorkel, which supplies breathing gas at ambient pressure.

Diver-Carried Reserve Breathing Gas — A diver-carried independent supply of air or mixed gas (as appropriate) sufficient under standard operating conditions to allow the diver to reach the surface, or another source of breathing gas, or to be reached by another diver.

Diver-In-Training — An individual gaining experience and training in additional diving activities under the supervision of a dive team member experienced in those activities.

Diving Control Board (DSB) — The group of individuals who act as the official representative of the Alaska Department of Fish and Game in matters concerning the scientific diving program (see Ch. 2, Section 1.24).

Diving Mode — A type of diving required specific equipment, procedures, and techniques, for example, snorkel, scuba, surface-supplied air, or mixed gas.

Diving Safety Officer (DSO) — The individual responsible for the safe conduct of the scientific diving program of ADF&G (see Ch. 2, Section 1.23).

Emergency Ascent — An ascent made under emergency conditions where the diver exceeds the normal ascent rate.

FSW — Feet of seawater, or equivalent static head.

Hookah Diving — A type of shallow water surface-supplied diving where there is no voice communication with the surface.

Hyperbaric Chamber — See decompression chamber.

Hyperbaric Conditions — Pressure conditions in excess of normal atmospheric pressure at the dive location.

Lead Diver — The certified scientific diver with experience and training to conduct the diving operation.

Local Dive Safety Officer (LDSO) — Individual assigned the duties of the DSO within a division or region (see Ch. 2, Section 1.25).

Maximum Working Pressure — The maximum pressure to which a pressure vessel may be exposed under standard operating conditions.

Mixed-Gas Diving — A diving mode in which the diver is supplied in the water with a breathing gas other than air.

MSW — Meters of seawater or equivalent static head.

No-Decompression limits — The depth-time limits of the “no-decompression limits and repetitive dive group designations table for no-decompression air dives” of the U.S. Navy Diving Manual or equivalent limits.

Normal Ascent — An ascent made with an adequate air supply at a rate of 60 feet per minute or less.

Pressure-Related Injury — An injury resulting from pressure disequilibrium within the body as the result of hyperbaric exposure. Examples include: decompression sickness, pneumothorax, mediastinal emphysema, air embolism, subcutaneous emphysema, or ruptured eardrum.

Pressure Vessel — See cylinder.

Psig — pounds per square inch gauge.

Recompression Chamber — see decompression chamber.

Scientific Diving — Scientific diving is defined (29 CFR 1910.402) as diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks.

Scuba Diving — A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus.

Standby Diver — A diver at the dive location capable of rendering assistance to a diver in the water.

Surface Supplied Diving — A diving mode in which the diver in the water is supplied from the dive location with compressed gas for breathing.

Swimming Ascent — An ascent which can be done under normal or emergency conditions accomplished by simply swimming to the surface.

Umbilical — The composite hose bundle between a dive location and a diver or bell, or between a diver and a bell, which supplies a diver or bell with breathing gas, communications, power, or heat, as appropriate to the diving mode or conditions, and includes a safety line between the diver and the dive location.

Weir — A dam or bulkhead over which water flows, or a bulkhead containing a notch through which water flows; weirs can be used to measure volume in a flow of water.

Working Pressure — The normal pressure at which the system is designed to operate.

Appendix 8. Request for diving reciprocity form. Verification of diver training and experience.

Where divers from two or more institutions plan to dive together in a joint project, the DSOs of each institution must agree on the code of practice that will apply to all divers. The DSO or DSB may develop reciprocity agreements with scientific diving organizations after review of that organization's Dive Safety Manual, appropriate Standard Operating Procedures, or Diving Rules. A standard operating code must be agreed upon and clearly communicated to all divers and personnel involved in each dive. A scientific diver that is currently certified under the auspices of an organizational member institution of the American Academy of Underwater Sciences (AAUS) shall be recognized by ADF&G and may apply for reciprocity in order to dive with ADF&G. The visiting diver will comply with the diving regulations of the host organization's Diving Safety Manual unless previously arranged by both organization's Diving Control Boards or DSO.

The host organization has the right to approve or deny this request and may require, at a minimum, a checkout dive with the Diving Safety Officer (DSO) or designee of the host organization. If the request is denied, the host organization should notify the DSO of the visiting diver the reason for the denial. The DSO for the visiting scientific diver has confirmed the following information:

(Date)		(Date)	
_____	Last medical examination	_____	CPR training
_____	Depth certification	_____	Oxygen administration
_____	Most recent checkout dive	_____	First aid for diving
_____	Scuba regulator/equipment service/test	_____	Date of last dive

Number of logged dives completed within previous 12 months? _____

Any restrictions? (Y/N) _____ if yes, explain: _____

Please check any pertinent specialty certifications:

_____	Dry Suit	_____	Rescue	_____	Blue Water
_____	Dive Computer	_____	Dive Master	_____	Altitude
_____	Nitrox	_____	Instructor	_____	Ice/Polar
_____	Mixed Gas	_____	EMT	_____	Cave
_____	Closed Circuit	_____	Dive Accident Management	_____	Night
_____	Saturation	_____	Chamber Operator	_____	Other _____
_____	Decompression	_____	Lifesaving		

Name of diver: _____

Emergency Information: (To notify in an emergency)

Name: _____

Relationship: _____

Telephone: (work) _____ (home) _____

Address: _____

This is to verify that the above individual is currently a certified scientific diver at: _____
(Name of Organization)

Local Diving Safety Officer: _____
(Signature) (Date)

cc ADF&G Dive Safety Officer _____
(Print) (Telephone, FAX, Email)

Appendix 9. Scientific diver checkout dive.

Name: _____

Date: _____

Location: _____

Certified scientific divers and Divers-In-Training should be able to demonstrate proficiency in the following skills during checkout dives or training evaluation dives with the Local Dive Safety Officer (LDSO) or designee:

- Knowledge of department diving standards and regulations
- Pre-dive planning, briefing, site orientation, and buddy check
- Use of dive tables and/or dive computer
- Equipment familiarity
- Underwater signs and signals
- Proper buddy contact
- Monitor cylinder pressure, depth, bottom time
- Swim skills:
 - Surface dive to 10 ft. without scuba gear
 - Demonstrate watermanship and snorkel skills
 - Surface swim without swim aids (400 yd. <12 min)
 - Underwater swim without swim aids (25 yd. without surfacing)
 - Tread water without swim aids (10 min.), or without use of hands (2 min.)
 - Transport another swimmer without swim aids (25 yd)
- Entry and exit (pool, boat, shore)
- Mask removal and clearing
- Regulator removal and clearing
- Surface swim with scuba; alternate between snorkel and regulator (400 yd.)
- Neutral buoyancy (hover motionless in midwater)
- Proper descent and ascent with BC
- Remove and replace weight belt while submerged
- Remove and replace scuba cylinder while submerged
- Alternate air source breathing with and without mask (donor/receiver)
- Buddy breathing with and without mask (donor/receiver)
- Simulated emergency swimming ascent
- Compass and underwater navigation
- Simulated decompression and safety stop
- Rescue:
 - Self rescue techniques
 - Tows of conscious and unconscious victim
 - Simulated in-water rescue breathing
 - Rescue of submerged non-breathing diver (including equipment removal, simulated rescue breathing, towing, and recovery to boat or shore)
 - Use of emergency oxygen on breathing and non-breathing victim
 - Accident management and evacuation procedures

Additional Training (optional)

- Compressor/ Fill station orientation and usage
 - Small boat handling
-

LDSO (or designee): _____
(signature)

Date: _____

(print name)

DIVE ACCIDENT OR INCIDENT

21. DIVE PLATFORM <input type="checkbox"/> A - Shore <input type="checkbox"/> B - Small boat <input type="checkbox"/> C - Research Vessel	22. DIVE ACTIVITY (up to 2 responses) <input type="checkbox"/> A - Collecting <input type="checkbox"/> B - Photography <input type="checkbox"/> C - Installing Equip. <input type="checkbox"/> D - Observing <input type="checkbox"/> F - Under instruction <input type="checkbox"/> G - Providing instruction <input type="checkbox"/> H - Other	23. ENVIRONMENT <input type="checkbox"/> A - Freshwater <input type="checkbox"/> B - Saltwater	24. ALTITUDE OF DIVE <input type="checkbox"/> A - Sea Level <input type="checkbox"/> B - > Sea Level but < 1000 ft <input type="checkbox"/> C - > 1000 ft		
25. Was this dive or dive series typical of your normal type of diving? <input type="checkbox"/> Y - Yes IF NO, Explain _____ <input type="checkbox"/> N - No		26. DIVER'S PERCEPTION OF TEMPERATURE <input type="checkbox"/> A - Cold <input type="checkbox"/> B - Hot <input type="checkbox"/> C - Comfortable	27. CURRENT STRENGTH <input type="checkbox"/> A - Strong <input type="checkbox"/> B - Moderate <input type="checkbox"/> C - Mild <input type="checkbox"/> D - None		
28. AIR SUPPLY <input type="checkbox"/> A - Scuba Air <input type="checkbox"/> B - Surface Supply Air <input type="checkbox"/> C - Mixed gas <input type="checkbox"/> D - None/Breath-hold dive	29. AIR CONSUMPTION <input type="checkbox"/> A - Ran low <input type="checkbox"/> B - Out of air <input type="checkbox"/> C - Not a problem <input type="checkbox"/> D - Buddy breathing (not octopus)	30. BUOYANCY PROBLEM <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No	31. RAPID ASCENT <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No	32. WITHIN LIMITS-Y or N <input type="checkbox"/> Tables (which table _____) or _____ <input type="checkbox"/> Computer (type _____)	33. TYPE OF SUIT <input type="checkbox"/> A - Wet <input type="checkbox"/> B - Partial Wet <input type="checkbox"/> C - Dry <input type="checkbox"/> D - Lycra <input type="checkbox"/> E - Swim
34. EQUIPMENT USED ON DIVE: (please check all that apply) <input type="checkbox"/> Depth gauge <input type="checkbox"/> Timing device/watch <input type="checkbox"/> Buoyancy vest <input type="checkbox"/> BC Inflator hose in use <input type="checkbox"/> Decompression computer	35. EQUIPMENT MALFUNCTION: <input type="checkbox"/> A - None <input type="checkbox"/> B - Regulator <input type="checkbox"/> C - BC Vest <input type="checkbox"/> D - Weight belt <input type="checkbox"/> E - Dry suit <input type="checkbox"/> F - DC Computer <input type="checkbox"/> G - Inflator hose <input type="checkbox"/> H - Contaminated air supply <input type="checkbox"/> I - Equipment was not familiar to you <input type="checkbox"/> J - Other Reason: _____	36. TYPE OF DIVE <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No <input type="checkbox"/> Single <input type="checkbox"/> Repetitive	37. WOMEN, PLEASE RESPOND (up to 2 responses) When the accident occurred, were you: <input type="checkbox"/> A - Menstruating <input type="checkbox"/> B - On birth control medication <input type="checkbox"/> C - Pregnant <input type="checkbox"/> D - None of the above		
38. DIVE LOCATION: State, Province, or Island: _____ Country or nearest country: _____		39. How long ago was your last Dive Trip/Series? Circle one: <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months		40. STRENUOUS EXERCISE <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No	
41. PREDIVE HEALTH <input type="checkbox"/> A - Nausea/vomiting <input type="checkbox"/> B - Hangover <input type="checkbox"/> C - Diarrhea <input type="checkbox"/> D - Other <input type="checkbox"/> E - No Problem	42. ALCOHOL Please check: <input type="checkbox"/> None <input type="checkbox"/> Night Before <input type="checkbox"/> Pre-dive <input type="checkbox"/> Between Dives <input type="checkbox"/> Post Dive Number of drinks, beers, or wine: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	43. RECREATIONAL DRUG USE Prior to, between, or after dive <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No	44. Do you consider yourself physically fit? <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No Do you exercise on a weekly basis? (Y or N) <input type="checkbox"/> # Days per week	<input type="checkbox"/> 24 hours pre-dive <input type="checkbox"/> During dive <input type="checkbox"/> 6 hours post-dive	
45. FATIGUE OR LACK OF SLEEP PRIOR TO DIVE? <input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No					

46. DIVE SERIES

Please fill in all that apply up to and including your last dive. If you skipped a day please leave that day blank

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Total # of dives	<input type="checkbox"/>						
Any night dive? (How many)	<input type="checkbox"/>						
Any symptoms? (Y or N)	<input type="checkbox"/>						
A - All no stop dive(s) E - Any safety stop C - Any dive requiring decompression stops	<input type="checkbox"/>						
A - Multilevel (time divided) B - Square ↓ ↑	<input type="checkbox"/>						
Deepest Dive (ft)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>						

DIVE ACCIDENT OR INCIDENT (con't)

47. DIVE PROFILE FOR DAY OF DIVE ACCIDENT Computer NDL For Next Dive

	1st DIVE	2nd DIVE	3rd DIVE	4th DIVE	5th DIVE	6th DIVE
GROUP LETTER						
SURFAC INT (MIN)						
DEC STOPS (MIN)						
DEPTH (FT)						
BOTTOM TIME (MIN)						

	1st DIVE	2nd DIVE	3rd DIVE	4th DIVE	5th DIVE	6th DIVE
GROUP LETTER						
SURFAC INT (MIN)						
DEC STOPS (MIN)						
DEPTH (FT)						
BOTTOM TIME (MIN)						

PRE-CHAMBER INFORMATION

48. INITIAL CONTACT WAS:

<input type="checkbox"/> A	DAN Emergency
<input type="checkbox"/> B	DAN Non-emergency
<input type="checkbox"/> C	Hospital emergency room
<input type="checkbox"/> D	Emergency medical service
<input type="checkbox"/> E	US Coast Guard
<input type="checkbox"/> F	Physician
<input type="checkbox"/> G	Dive instructor/shop
<input type="checkbox"/> H	Other

49. Total delay from symptom onset to contacting DAN or other medical help:

HOURS or DAYS

50. FLYING OR INCREASED ELEVATION AFTER DIVING AND PRIOR TO TREATMENT?

<input type="checkbox"/> A	Commercial airliner	Hours post dive (flew or went into elevation)	<input type="text"/>
<input type="checkbox"/> B	Unpressurized aircraft		
<input type="checkbox"/> C	Med Evac Flight		
<input type="checkbox"/> D	Mountain elevation		
<input type="checkbox"/> E	Does not apply		

51. SIGNS & SYMPTOMS

1st Symptom <input type="checkbox"/>	A - Pain	R - Muscle twitching
2nd Symptom <input type="checkbox"/>	B - Rash	S - Convulsions
3rd Symptom <input type="checkbox"/>	C - Itching	T - Hearing loss
4th Symptom <input type="checkbox"/>	D - Weakness	U - Ringing ears
5th Symptom <input type="checkbox"/>	E - Numbness/Tingling	V - Decreased skin sensation
6th Symptom <input type="checkbox"/>	F - Dizziness/Vertigo	W - Bladder problem
	G - Semi-consciousness	X - Bowel problem
	H - Unconsciousness	Y - Personality change
	I - Restlessness	Z - Difficulty walking standing
	J - Extreme fatigue	1 - Reflex change
	K - Visual disturbance	2 - Other
	L - Speech disturbance	
	M - Headache	
	N - Paralysis	
	O - Difficulty breathing	
	P - Nausea/Vomiting	
	Q - Hemoptosis/coughing blood from lungs	

52. LOCATION: Block A = location of symptom Then please check (✓)
L = Left R = Right B = Bilateral/Both Sides

	A	L	R	B	
1st Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A - Head S - Abdomen
2nd Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B - Face T - Buttock
3rd Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	C - Sinus U - Groin
4th Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	D - Eyes V - Hip
5th Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	E - Ears W - Entire leg
6th Symptom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	F - Neck X - Thigh
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	G - Shoulder Y - Knee
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	H - Entire arm Z - Calf
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I - Upper arm 1 - Shin
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	J - Elbow 2 - Ankle
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	K - Forearm 3 - Foot
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L - Wrist 4 - Toes
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	M - Hand 5 - Trunk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N - Fingers 6 - Generalized
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	O - Chest 7 - Other
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	P - Back
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Q - Upper back
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R - Lower back

53. SYMPTOM ONSET:

	HOURS	MINUTES	or	BEFORE SURFACING FROM DIVE
1st Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>
2nd Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>
3rd Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>
4th Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>
5th Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>
6th Symptom	<input type="text"/>	<input type="text"/>		<input type="checkbox"/>

54. ANY OF THE SYMPTOMS FROM #51 PRIOR TO THE LAST DIVE?

Y - Yes N - No

If yes, which symptoms? Other

1st Explain _____

2nd _____

3rd _____

4th _____

5th _____

6th _____

55. FIRST AID ADMINISTERED BEFORE HOSPITAL OR CHAMBER HELP WAS RECEIVED?

Y - Yes N - No

Oxygen

Aspirin

Oral fluids

Head down position/Trendelenburg

If oxygen was received was delivery by

A - Demand valve

B - Freeflow valve

C - Don't know

PRE-CHAMBER INFORMATION (cont.)

<p>56. HOSPITAL TREATMENT ADMINISTERED (Please check all that apply):</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> None</td> <td><input type="checkbox"/> Steroids</td> </tr> <tr> <td><input type="checkbox"/> Oral fluids</td> <td><input type="checkbox"/> Anticoagulant</td> </tr> <tr> <td><input type="checkbox"/> IV fluids</td> <td><input type="checkbox"/> Aspirin</td> </tr> <tr> <td><input type="checkbox"/> Oxygen</td> <td><input type="checkbox"/> Other medication</td> </tr> </table>	<input type="checkbox"/> None	<input type="checkbox"/> Steroids	<input type="checkbox"/> Oral fluids	<input type="checkbox"/> Anticoagulant	<input type="checkbox"/> IV fluids	<input type="checkbox"/> Aspirin	<input type="checkbox"/> Oxygen	<input type="checkbox"/> Other medication	<p>57. RELIEF BEFORE CHAMBER TREATMENT?</p> <p><input type="checkbox"/> A - Complete <input type="checkbox"/> B - Partial <input type="checkbox"/> C - Temporary <input type="checkbox"/> D - None</p>	<p>58. IF ANY RELIEF OCCURRED, WHICH SYMPTOMS FROM #51 ABOVE? (Please check):</p> <p>1st: <input type="checkbox"/></p> <p>2nd: <input type="checkbox"/></p> <p>3rd: <input type="checkbox"/></p> <p>4th: <input type="checkbox"/></p> <p>5th: <input type="checkbox"/></p> <p>6th: <input type="checkbox"/></p>
<input type="checkbox"/> None	<input type="checkbox"/> Steroids									
<input type="checkbox"/> Oral fluids	<input type="checkbox"/> Anticoagulant									
<input type="checkbox"/> IV fluids	<input type="checkbox"/> Aspirin									
<input type="checkbox"/> Oxygen	<input type="checkbox"/> Other medication									
<p>59. PRE-CHAMBER RELIEF OCCURRED:</p> <p><input type="checkbox"/> A - Without first aid or medical care <input type="checkbox"/> B - Following first aid <input type="checkbox"/> C - Following pre-chamber hospital care <input type="checkbox"/> D - No relief occurred</p>										

CHAMBER TREATMENT

<p>60. CHAMBER TREATMENT FACILITY LOCATION</p> <p style="text-align: center;">CITY</p> <p>_____</p> <p>STATE _____ COUNTRY _____</p> <p>Date & Time of Treatment</p> <p>MONTH/DAY/YEAR _____ Time _____ AM _____ PM</p> <p>Name of hyperbaric facility</p> <p>_____</p> <p>Treating doctor</p> <p>_____</p> <p>Form Completed By</p> <p>_____</p>	<p>61. TYPE OF CHAMBER (please check)</p> <table style="width:100%;"> <tr> <td style="width:50%;">Initial Treatment</td> <td style="width:50%;">Retreatment Chamber</td> </tr> <tr> <td><input type="checkbox"/> Monoplace</td> <td><input type="checkbox"/> Monoplace</td> </tr> <tr> <td><input type="checkbox"/> Dualplace</td> <td><input type="checkbox"/> Dualplace</td> </tr> <tr> <td><input type="checkbox"/> Multiplace</td> <td><input type="checkbox"/> Multiplace</td> </tr> <tr> <td><input type="checkbox"/> No chamber treatment given</td> <td></td> </tr> </table>	Initial Treatment	Retreatment Chamber	<input type="checkbox"/> Monoplace	<input type="checkbox"/> Monoplace	<input type="checkbox"/> Dualplace	<input type="checkbox"/> Dualplace	<input type="checkbox"/> Multiplace	<input type="checkbox"/> Multiplace	<input type="checkbox"/> No chamber treatment given		<p>62. TOTAL DELAY FROM SYMPTOM ONSET TO RECOMPRESSION</p> <p>HOURS _____ or DAYS _____</p>
Initial Treatment	Retreatment Chamber											
<input type="checkbox"/> Monoplace	<input type="checkbox"/> Monoplace											
<input type="checkbox"/> Dualplace	<input type="checkbox"/> Dualplace											
<input type="checkbox"/> Multiplace	<input type="checkbox"/> Multiplace											
<input type="checkbox"/> No chamber treatment given												
<p>63. INITIAL TREATMENT</p> <p><input type="checkbox"/> A - USN TT4 <input type="checkbox"/> B - USN TT5 <input type="checkbox"/> C - USN TT6 <input type="checkbox"/> D - USN TT6A <input type="checkbox"/> E - HART Protocol <input type="checkbox"/> F - KINDWALL Protocol <input type="checkbox"/> G - 45 fsw 90 min <input type="checkbox"/> H - 33 fsw 120 min <input type="checkbox"/> I - Other _____</p>		<p>64. TABLE EXTENSIONS REQUIRED?</p> <p><input type="checkbox"/> Y - Yes <input type="checkbox"/> N - No</p>										

<p>66. RETREATMENT GIVEN (Provide up to 3 responses)</p> <table style="width:100%;"> <tr> <td style="width:50%;">TABLE</td> <td style="width:50%;">NUMBER OF TREATMENTS</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <p>A - USN TT4 B - USN TT5 C - USN TT6 D - USN TT6A E - HART Protocol F - KINDWALL Protocol G - 45 fsw 90 min H - 33 fsw 120 min I - Other _____</p>	TABLE	NUMBER OF TREATMENTS	<input type="checkbox"/>	<p>67. RELIEF AFTER HYPERBARIC THERAPY COMPLETED?</p> <p><input type="checkbox"/> A - Complete <input type="checkbox"/> B - Partial <input type="checkbox"/> C - Temporary <input type="checkbox"/> D - Hyperbaric therapy not completed <input type="checkbox"/> E - None</p>	<p>68. RESIDUAL SYMPTOMS AFTER HYPERBARIC THERAPY COMPLETED?</p> <p><input type="checkbox"/> A - Pain only <input type="checkbox"/> B - Neurologic <input type="checkbox"/> C - Hyperbaric therapy not completed <input type="checkbox"/> D - None</p>	<p>65. RELIEF AFTER INITIAL TREATMENT OF SYMPTOM FROM # 51?</p> <p>1st: <input type="checkbox"/></p> <p>2nd: <input type="checkbox"/></p> <p>3rd: <input type="checkbox"/></p> <p>4th: <input type="checkbox"/></p> <p>5th: <input type="checkbox"/></p> <p>6th: <input type="checkbox"/></p> <p>Please indicate A - Complete B - Partial C - Temporary D - None</p>					
TABLE	NUMBER OF TREATMENTS										
<input type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>										
<p>69. DURATION OF RESIDUAL SYMPTOMS</p> <p>(Circle one)</p> <p>DAYS _____</p> <p>WEEKS _____</p> <p>MONTHS _____</p>		<p>70. FINAL DIAGNOSIS:</p> <p><input type="checkbox"/> A - DCS I <input type="checkbox"/> B - DCS II <input type="checkbox"/> C - Air Embolism <input type="checkbox"/> D - Pulmonary Barotrauma <input type="checkbox"/> O - Other _____</p>									

Appendix 12. Guidelines for use of dive computers.

From AAUS Dive Computer Workshop. Lang and Hamilton (Eds.). U.S.C. Sea Grant Program, Los Angeles, CA, 1989.

1. Only those makes and models of dive computers specifically approved by the LDSO may be used.
2. Any diver desiring the approval to use a dive computer as a means of determining decompression status must apply to the LDSO, and complete an appropriate practical training session.
3. Each diver relying on a dive computer to plan dives and indicate or determine decompression status must have his own unit.
4. On any given dive, both divers in the buddy pair must follow the most conservative dive computer.
5. If the dive computer fails at any time during the dive, the dive must be terminated and appropriate surfacing procedures should be initiated immediately.
6. A diver should not dive for 18 hours before activating a dive computer to use it to control his diving.
7. Once the dive computer is in use, it must not be switched off until it indicates complete outgassing has occurred or 18 hours have elapsed, whichever comes first.
8. When using a dive computer, non-emergency ascents are to be at a rate specified for the make and model of dive computer being used.
9. Ascent rates shall not exceed 30 fsw/min.
10. Whenever practical, divers using a dive computer should make a stop between 10 and 30 feet for 5 minutes, especially for dives below 60 fsw.
11. Only 1 dive on the dive computer in which the No Decompression Limits of the tables or dive computer has been exceeded may be made in any 18-hour period.
12. Repetitive and multi-level diving procedures should start the dive, or series of dives, at the maximum planned depth, followed by subsequent dives of shallower exposures.
13. Multiple deep dives require special consideration.

Appendix 13. Safe ascent recommendations.

From: AAUS BIOMECHANICS OF SAFE ASCENTS WORKSHOP. 1990. Lang and Egstrom (Eds.)

It has long been the position of the American Academy of Underwater Sciences that the ultimate responsibility for safety rests with the individual diver.

The time has come to encourage divers to slow their ascents.

1. Buoyancy compensation is a significant problem in the control of ascents.
2. Training in, and understanding of, proper ascent techniques is fundamental to safe diving practice.
3. Before certification, the diver is to demonstrate proper buoyancy, weighting and a controlled ascent, including a “hovering” stop.
4. Diver shall periodically review proper ascent techniques to maintain proficiency.
5. Ascent rates shall not exceed 30 fsw per minute.
6. A stop in the 10-30 fsw zone for 3–5 min. is recommended on every dive.
7. When using a dive computer or tables, non-emergency ascents are to be at the rate specified for the system being used.
8. Each diver shall have instrumentation to monitor ascent rates.
9. Divers using dry suits shall have training in their use.
10. Dry suits shall have a hands-free exhaust valve.
11. BCs shall have a reliable rapid exhaust valve which can be operated in a horizontal swimming position.
12. A buoyancy compensator is required with dry suit use for ascent control and emergency flotation.
13. Breathing 100% oxygen above water is preferred to in-water air procedures for omitted decompression.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Date:

Kyle Hebert
Dive Safety Officer
Alaska Department of Fish and Game
16 Sing Lee Alley
Petersburg, AK 99833

Dear Mr. Hebert,

Pursuant to satisfying those requirements described in the Alaska Department of Fish and Game's Dive Safety Manual, I am requesting that:

Name:
Position:
Location:
Division:

become certified for scuba diving under department auspices.

Sincerely,

Regional Supervisor or designee: _____
(signature)

(print name)

Appendix 15. Department diver authorization checklist.

Individuals wishing to be involved in scientific scuba diving activities under department auspices must have prior supervisory approval and must adhere to the established Diving Safety Manual. The following listed items should be current and submitted to your Local Dive Safety Officer (LDSO) for approval prior to engaging in department scientific diving.

Name: _____

Social Security Number _____

Division: _____

Location: _____

Position: _____

PCN: _____

Authorization to participate in scientific diving letter (Appendix 14): _____

Copies of the following current certifications:

Scuba diving certification card(s): _____

Basic open water scuba training (Sec. 4.00): _____

Diver-In-Training Permit (Sec. 4.30): _____

Advanced scuba training (see Sec. 5.32 in the DSM): _____

Dive Master (Sec. 5.80): _____

All other diving certifications (e.g. Instructor, Rescue Diver): _____

Checkout Dive and Training Evaluation as required by the DSO or LDSO (Appendix 9): _____

Field Practicum (Sec. 5.34): _____

First Aid: _____

CPR: _____

Oxygen administration: _____

All other certification cards (e.g. Life Saving, EMT): _____

Medical Evaluation of Fitness for Scuba Diving (Appendix 2 and Sec. 6.00): _____

Summary of the total number and accumulated bottom time of logged dives being used to fulfill the diving experience requirement. A complete dive history by year (number of logged dives and bottom time) is encouraged. (Do **NOT** send your dive log or copies of your dive log!): _____

Authorization To Dive memo (Appendix 16): _____

LDSO, Region Date

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

AUTHORIZATION TO DIVE FOR THE ALASKA DEPARTMENT OF FISH AND GAME

To: [Diver's name and address, PCN]

Level of Certification

You are authorized to the level indicated below, to use self-contained, underwater breathing apparatus incident to the performance of your official duties and subject to Alaska Department of Fish and Game policy and regulations. All appropriate levels must be initialed and dated by your Local Dive Safety Officer (LDSO) or the Dive Safety Officer (DSO) prior to participating at that level.

Diver-in-Training (Sec. 4.30): _____ Field Practicum (Sec. 5.34): _____

Scientific Diver (Sec. 5.00): _____

Depth Certification Level: 30 fsw: _____ 60 fsw: _____
(Sec. 5.40) 100 fsw: _____ 130 fsw: _____

Dive Master (Sec. 5.80): _____

Temporary Diver (Sec. 5.10.2): _____ Valid for a limited time as indicated here: _____

_____ Last medical examination _____ Oxygen administration (exp)
_____ First aid (exp) _____ 5-year refresher (due)
_____ CPR training (exp)

Restrictions

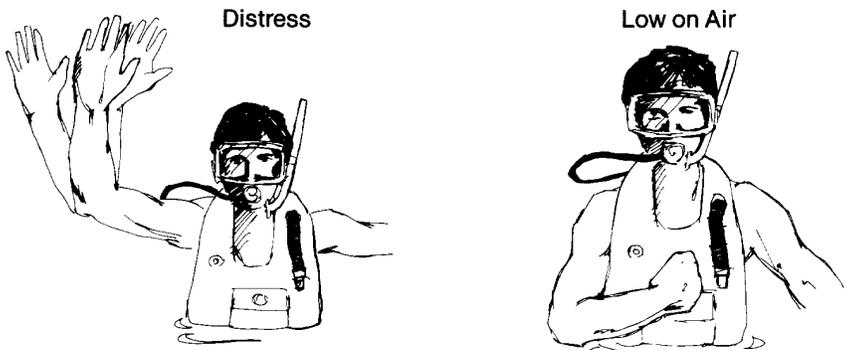
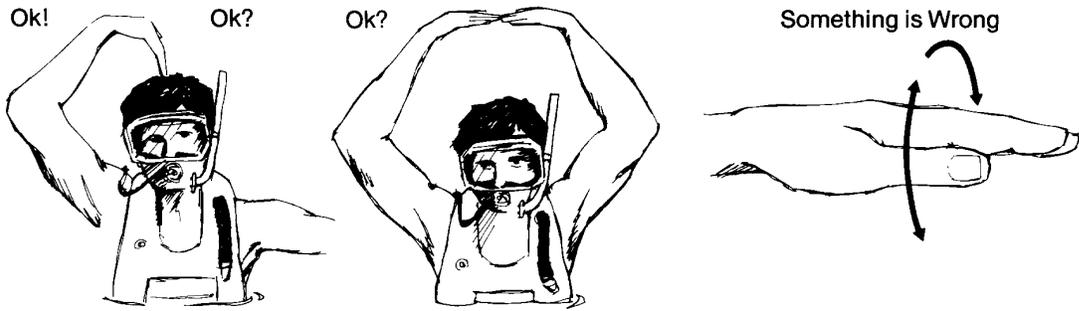
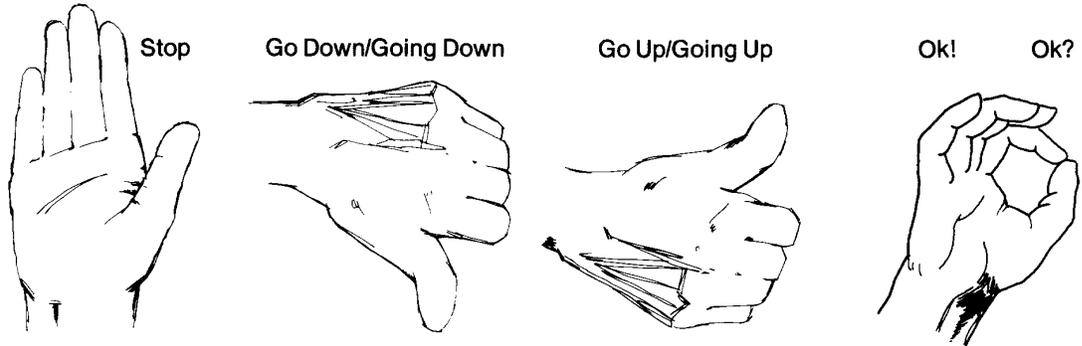
Remarks

To maintain this authorization as an Alaska Department of Fish and Game diver, it is your responsibility to maintain familiarity and compliance with ADF&G's Dive Safety Manual (DSM) including maintaining diver proficiency by completing a minimum of 2 logged dives per two month period (12 dives per year). All records documenting compliance with the DSM are to be provided to your assigned LDSO. This Authorization To Dive expires 12 months from the date signed below by the LDSO and must be renewed after that time prior to diving under Department auspices.

LDSO: _____ Date: _____
cc Kyle Hebert, ADF&G Dive Safety Officer

Appendix 17. Selected hand signals.

From: NOAA Diving Manual, October 1991, Figs. 14-2A and 14-2B



Appendix 17. (page 2 of 2)



Me, or watch me



Come here



Go that way



I am cold



Which direction?



Yes



No



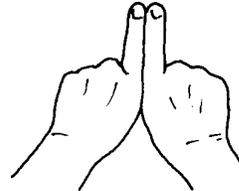
Take it easy, slow down



Ears not clearing



Hold hands



Get with your buddy



Look



You lead, I'll follow



What time? What depth?



I don't understand

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfield Drive, Suite 300, Arlington, VA 22203; or O.E.O., U.S. Department of the Interior, Washington DC 20240.

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