



Risk Management Form

Document Details

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Faculty	Science	School	School of Biological, Earth and Environment

Risk Management Details

Risk Management Form Description	Diving for scientific research or teaching purposes using SCUBA
Locations	BEES Off campus Australia, BEES Off campus New South Wales, BEES Off campus Sydney metro, KENC-D26-LG-LG10
Persons at Risk	Workers, Students, Visitors, Contractors
Consultation Process	All diving personnel must read this form as well as the UNSW SCUBA diving operations manual, WHS Regulations for Diving and the AS2299.2 standards.
Related Legislation, Standards, Codes of Practice etc.	WHS Act 2011; WHS Regulations 2011; Work Health and Safety Regulation 2011 exemption No. 009/12; AS/NZS 2299.2:2002 Scientific diving; UNSW SCUBA diving operations manual (latest version)

Hazards and Risks

Hazard Task	Driving before or after diving
Hazard Category	Fatigue - inadequate rest
Associated Harm	Car accident. Decompression Illness.
Existing Controls	Drivers must be adequately rested before diving or driving. Drivers must wait appropriate time before flying or driving at altitude (refer to UNSW SCUBA operations manual). If DCI symptoms occur while driving up altitude, drive down immediately and seek emergency assistance.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	Be aware of driving to altitude after diving.
Hazard Task	Handling diving equipment
Hazard Category	Manual handling - Poor technique
Associated Harm	Back strain injury or crushing injury
Existing Controls	Use proper manual handling techniques to avoid strains – bend at the knees

	and do not twist as you lift. Get assistance from your buddy when dressing in/out of gear. Do not 'flip' BCD/cylinder over your head. Don't carry excessive weight.
Risk Consequence	Minor
Risk Likelihood	Unlikely
Risk Rating	Low
Additional Controls	-
Hazard Task	Slippery surfaces.
Hazard Category	Slip, trip, fall - Fall on same level
Associated Harm	Strains, sprains. Cuts, grazes
Existing Controls	Move cautiously. Wear appropriate footwear (booties). Chose the most appropriate entry/exit location. Identify alternate exit before diving. Wait for the ideal swell. Try to pick the last wave in a set. Remove fins if appropriate, give and accept buddy assistance. Consider hooking catch bags to dive float (shore) or pass up to boat operator (boats). First aid trained divers. Mobile phone on site.
Risk Consequence	Minor
Risk Likelihood	Unlikely
Risk Rating	Low
Additional Controls	-
Hazard Task	Thermal hazards
Hazard Category	Weather - Cold/heat
Associated Harm	Hypothermia, sun stroke or sun burn.
Existing Controls	Wear appropriate PPE including wetsuit, hood and gloves. Change into dry clothes after dive. Out of water wear sunscreen, hats, sunglasses, shirts, water for hydration. Monitor yourself and the rest of the team. Be aware of dive signals.
Risk Consequence	Insignificant
Risk Likelihood	Unlikely
Risk Rating	Low
Additional Controls	-
Hazard Task	Weather, Wave Action, Tides and Currents
Hazard Category	Water - Tides, currents, floods, swell, surf, tsunami
Associated Harm	Cuts and bruises. Injury or drowning.
Existing Controls	Check weather and marine forecasts. Do not dive if thunderstorms are predicted. Cancel fieldwork under dangerous conditions. Do onsite risk assessment for each dive and conduct dive brief to discuss. Conduct site specific risk assessment. Dive on slack tide in areas of current. Consider diving from a boat and using mermaid lines.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Dangerous Marine Animals
Hazard Category	Animal & insect
Associated Harm	Cuts, scratches, bites, death
Existing Controls	Wear PPE, carry a dive knife, dive in buddy pairs. The risk of sharks must be assessed and shark shields must be worn according to Dive Operation Manual. The DPI Sharksmart app is check each diving day. If a dangerous shark is seen, stay close to the substrate and leave the water if possible. First

Risk Consequence	aid trained divers. Be familiar with how to treat serious bleeding, and venom pressure immobilisation. Have First Aid kit and O2 kit on site and emergency plan. Gain local knowledge through consultation.
Risk Likelihood	Major
Risk Rating	Rare
Additional Controls	Medium
Hazard Task	-
Hazard Category	Overhead environments and sharp edges
Associated Harm	ZOther
Existing Controls	Cuts, grazes and bruises Wear PPE, avoid entry/egress over rocky areas, Move cautiously and be aware of overhead environments especially jetties. Look up when ascending and hold arm above your head. First aid on site, shore person to help with gear collection. Conduct dive briefing.
Risk Consequence	Minor
Risk Likelihood	Unlikely
Risk Rating	Low
Additional Controls	-
Hazard Task	Entanglement
Hazard Category	Diving - Entanglement/Obstruction
Associated Harm	Drowning
Existing Controls	Carry a dive knife and maintain buddy contact. Keep a distance from nets particularly in swell. Nets pose a high risk and additional training/certification may be required. Keep gear and work lines tidy and organised, keep dive flag line taught. Be especially aware in areas where fishing is conducted. If using a portable dive flag, do not attach the flag to your body or equipment unless using a quick release buckle (Fastex buckle).
Risk Consequence	Moderate
Risk Likelihood	Unlikely
Risk Rating	Medium
Additional Controls	-
Hazard Task	Diving from a boat
Hazard Category	Plant & Equipment
Associated Harm	Drowning; death;unconsciousness; prop strikes; crushed; cuts; abrasions; strains
Existing Controls	Determine the best way to exit the boat (backwards roll, giant stride, don gear in water). Don fins before weight belt. Inflate BCD before entry. Check the current and deploy a safety line if required. Enter water only with permission of boat operator, and after checking water for obstructions; announce your intention to leave the boat; give ok signal upon entering water. Recommended to descend and ascend on anchor or shot line; ascend fist first and looking for surface obstructions. Only approach/reenter boat with skipper's permission. Keep clear of the ladder while another diver is climbing into the boat. Discuss arm signals for OK, distress, swim to boat, don't approach boat.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	DCI, lung over expansion, O2/Co2 toxicity and other diving maladies.
Hazard Category	Diving - DCI

Associated Harm	Injury or death
Existing Controls	Use DCIEM tables when diving and plan appropriately. Follow the UNSW Dive Manual. Do not dive greater than 30m, dive in buddy pairs, and conduct safety stops. Ascend rate 18m +/- 3m/minute. Do not perform breath hold diving (free diving) until a Repetitive factor of 1.0 is reached. Be aware of factors that increase risk of DCI (fatigue, dehydration, deep diving, cold water or changes in water temperature, heavy exercise during or after dive, hot shower after dive, exposure to altitude). At least 2 persons trained to perform dive rescues in each dive team. Have divers trained to assist with First Aid/CPR and O2 administration. Carry first aid kit and sufficient oxygen for the size of the time team and distance from a chamber. Have planned emergency responses, practice drills. Have mobile phone or other communications.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Nitrogen narcosis
Hazard Category	Diving - Narcosis/gas toxicity
Associated Harm	Be aware of symptoms. Ascend to shallow depths to alleviate symptoms. Dive in buddy pairs.
Existing Controls	Be aware of symptoms. Dive in buddy pairs. Ascend to shallow depths to alleviate symptoms.
Risk Consequence	Moderate
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Out of air or low air
Hazard Category	Diving - Lung over expansion
Associated Harm	Lung over expansion injury; drowning, death.
Existing Controls	Monitor air, communicate air to buddy and maintain buddy contact. It is mandatory to return to surface with at least 50 bar. Do not hold breath in emergency ascent if out of air. Carry a snorkel for long surface swims.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Deep diving
Hazard Category	Diving - DCI
Associated Harm	Increased risk of DCI & narcosis; injury and death
Existing Controls	Adhere to DCIEM tables and UNSW dive manual. Divers should be aware of maximum bottom times in case they go over their planned depth. Safety stops are mandatory for dives over 12 meters but are recommended on all dives Monitor air consumption of yourself and buddy more often. Divers susceptibility to narcosis need to be managed ie acclimation dives at lesser depths. Practice work tasks at lesser depths.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Limited Visibility and Night Diving

Hazard Category	Environmental hazard
Associated Harm	Lost diver.
Existing Controls	Shore support required during limited visibility and night dives. Unrestricted dives only with experience in limited visibility. Maintain physical buddy contact and consider using buddy lines. Night dives: take 2 sources of illumination per diver. Ensure entry, exit, and dive flag illuminated. Only dive at sited you have dived before.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Equipment failure
Hazard Category	ZOther
Associated Harm	Aborted dives, injury, death
Existing Controls	BCDS and regulators must be serviced annually. Any faulty/out of date gear must be tagged out and immediately reported to the Dive Officer. Take great care with equipment; avoid contact with sand, clean all gear each day according to UNSW protocol (including the inside of the BCD). Lie cylinders down when not under direct contact. Rinse with fresh water after diving.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-
Hazard Task	Pollution
Hazard Category	Environmental hazard
Associated Harm	Rashes and scikness
Existing Controls	Check http://www.environment.nsw.gov.au/beach/ for updates to view pollution forecast for NSW areas.
Risk Consequence	Minor
Risk Likelihood	Rare
Risk Rating	Low
Additional Controls	-
Hazard Task	Diving during Covid 19 pandemic
Hazard Category	Biological - GMO
Associated Harm	illness and death
Existing Controls	1. Maintain a 1.5 m distance during preparation and clean up of diving operations. This is not required while underwater. 2. Follow covid safety precautions for boating operations. 3. If wearing masks, they must be changed if they become wet. 3. The Dive Coordinator will be the only person to handle paperwork and will sign off on behalf of the dive team. 4. Wash/sanitise your hands before and after handling UNSW dive equipment (this includes all SCUBA gear, cylinders, first aid and oxygen equipment). 5. Divers should not share diving equipment especially regulators, masks, and snorkels. Divers should separate their equipment from those of other divers. Use your own dive tub when transporting and storing equipment (including on boats). 6. Divers should only handle and set up their own diving equipment. Buddy checks shall only done without touching another person's equipment. 7. If doing multiple dives with BEES equipment, please mark the number of the regulator set the diver is using on the dive logs, so that they do not get mixed up. 8. Use defogger rather than spit to defog masks. 9. Divers

should assign tasks consistently between divers to minimise cross contamination of sampling equipment. 10. Wash/sanitise hands before handling cylinders. Avoid touching valve outlet. Wash/sanitise hands or wear gloves if changing o-rings. 11. Wash/sanitise hands or wear gloves before setting up and dismantling the Oxygen Kit. Hands must be dry if hand sanitiser has been used, as it is flammable. IMPORTANT: Do not store hand sanitiser in the O2 Kit tub! 12. During an 'out of air emergency' the donee shall take the doner's octopus and not their primary second stage. 13. During a CPR emergency: i. Ensure PPE is donned. Consider wearing a face mask. The ARC suggests that there is some potential for chest compressions to generate aerosols. ii. Determine if the victim is breathing by simply observing chest movements. The rescuer's face should not come close to the victim's face. iii. If the victim is unconscious and not breathing, start chest compressions without rescue breaths/ventilations. Equipment Cleaning and Disinfecting Protocols: 1. Wash/sanitise your hands before and after handling UNSW dive equipment (this includes all SCUBA gear, cylinders, first aid and oxygen equipment). 2. At the end of the dive day UNSW regulators and BCD oral inflators (if used) need to be disinfected according to attached protocol. 3. All other equipment should be washed in soapy water. 4. Divers should consider using separate tubs to clean equipment. Equipment cleaning methods for high risk surfaces: Trigene (20:1 dilution) – Preferred method: For most effective results, immerse regulator mouth pieces in bath of solution. Spray other potentially infected surfaces (such as first stage, gauges and inflator disconnecter) with same solution. Leave for 10 minutes before rinsing well in fresh water. Betadine -povidone iodine (1-2%): Spray mouthpieces and other potentially infected surfaces with Betadine and leave for 10 minutes before rinsing well in fresh water. 10 % Bleach: For most effective results, immerse regulator mouth pieces in bath of solution. Spray other potentially infected surfaces (such as first stage, gauges and inflator disconnecter) with same solution. Leave for 10 minutes before rinsing well in fresh water. Mix a fresh batch each day and discard whatever is left over according to UNSW chemical waste policy.

Risk Consequence

Major

Risk Likelihood

Unlikely

Risk Rating

Medium

Additional Controls

-

Hazard Task

Setting up and dismantling Oxygen Equipment

Hazard Category

Fire/Explosion - Gas

Associated Harm

Injury or death

Existing Controls

Only medical grade oxygen is used. Users are trained in Advanced Resuscitation which included oxygen use.

Risk Consequence

Major

Risk Likelihood

Rare

Risk Rating

Medium

Additional Controls

Oxygen is only used and stored in a well-ventilated area. Oxygen is not used near sources of ignition (e.g. smoking, flames, oil, grease, ethanol, hand sanitiser). Oxygen cylinder is handled very carefully. Valve damage from a dropped cylinder can cause the cylinder to act as a missile causing severe injuries. Valve is opened slowly with pressure gauge facing away from people. Kit is cleaned and dried upon return.

Hazard Task

Using Dive cylinders

Hazard Category

Plant & Equipment

Associated Harm	Injury or death
Existing Controls	Transporting cylinders 1. Cylinders move at the same speed as the vehicle they are travelling in. Cylinders must not be transported inside the vehicle unless they are restrained or are separated from the occupants (ie in a caged area or canopied tray). 2. Cylinders must be secured while in transport. Use foam holders. 3. IMPORTANT please handle cylinders carefully. A dropped cylinder can cause damage to the valve and result in the cylinder acting as a missile. Storing cylinders 1. Cylinders in the dive room should be stored vertically with the chain restraints. 2. Store away from heat sources. 3. If storing for more than 90 days, the pressure in the cylinders should be reduced ≤ 20 bar /300psi General care and maintenance of cylinders 1. Always check your cylinder before use. If there are any signs of damage, rattling noises or air escaping do not use and tag out of service. 2. Never leave a cylinder standing up unattended. 3. Keep cylinders out of extreme temperatures (ie store them in the shade). 4. Rinse cylinder with fresh water after use. 5. Never allow cylinders to become empty as this allows water to get in and cause corrosion. If they do become empty, tag the cylinder out of service, and inform the diving officer immediately, so a check can be scheduled. 6. Only fill cylinders at a reputable cylinder fill station. 7. Cylinders must be hydrostatically tested every year.
Risk Consequence	Major
Risk Likelihood	Rare
Risk Rating	Medium
Additional Controls	-

Other Risk Management Details

Date All Controls Implemented	23/06/2020
Emergency Procedures	Refer to Dive Proposal and detailed Emergency Procedures for each dive site . In case of diver emergency contact DES (Divers Emergency Services) on 1800 088 200. Get the Emergency App - '000"
Competency and Training Required	Diver registered with University Australia NSW or letter of reciprocity recieved from another institution. Must hold appropriate diver certification (see UNSW SCUBA diving operations manual for details), apply first aid or remote first aid cerification, oxygen provider certification and A2299.1 medical.

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