**Environmental and Social Management Plan for “Reduction of ocean pollution through sea floor clean up, and education of fishermen and youths about the impact of ocean pollution”**

1. **Project Description** (location, specific activities)

*Briefly list the planned activities. Clearly identify the issues to be addressed in terms of potential E&S impacts and the proposed solution (to be retrieved from the concept note and/or full proposal - 500 words max).*

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| The project aims to clean up 3 sites around Mahé; to assist in the reduction of ocean pollution which is currently a global concern. The total area that is planned to be cleaned (using Grant project funds under 3 separate phases) is presented below:   |  |  |  | | --- | --- | --- | |  | | | | Phase 1: East Coast/Providence  Area: 1,916,608 sqm | Phase 2: North East Coast  Area: 254,128 sqm | Phase 3: North West Coast  Area: 571,171 sqm |   *Figure 1 – Areas to be cleaned*  **Phase 1 - Providence**  Providence is located on the East Coast of Mahe, about 7 km South of Victoria and was one of the first areas to be reclaimed in the 1980’s. The area currently hosts a variety of infrastructures and services with the great majority being industrial areas but also includes a busy commercial area, post-secondary education institutions, a land fill and a desalination plant.  Most of the original marine habitats were destroyed during the reclamation with possibly some strips of fringing reefs and reef patches remaining. In general, the most dominant composition immediately from the shoreline at the site consists of a mixture of silt and sand. The coral rubble is most likely as a results remnant of reefs which used to exist in the past at the site. The sand naturally occurs from the coral reef and the silt is most likely as a result of the reclamation.  Although several decades have passed, silt has remained on the seabed in most of the area mixing with the sand. Macro algae such as brown algae from the *Dictyota spp* and *Sargassum spp* makes up most of the biotic composition of the reef flats.  The abiotic composition of the reef flats is mostly sand, coral rubble as well as consolidated limestone. Coral patches consisting of common species genus such as *Acropora*, *Galaxea, Styllophora, Favites, Favia* and *Porites* are quite common in the area as with most reefs around the inner granitic islands.  The reef slope the sea bed is composed of mostly rubble, sand and low coral cover of various species including *Acropora, Porites, Goneastria, Leptoria* amongst others. The top of the reef slopes generally has a greater coral cover compared to the bottom of the slopes where coral rubble is usually more dominant.  In general, the health status of the reef ecosystem in the surrounding area of the site can be described as below average. Although there are some areas with relatively good coral cover, most of the existing reef consists of consolidated limestone, coral rubble and macro algae (*Sargassum spp.)*. Sand silt and rubble dominates the reef flat, with very little fauna. The relatively low status of the marine environment around the site is most likely as a result of the various stresses the ecosystems have endured over the years. This includes the physical damage as well as intense sedimentation during and after the reclamation as well as the mass coral bleaching that occurred in the late 1990’s. As a result of the damage caused by the reclamation, there are no sensitive ecological habitats at the Providence site.  **Phase 2 - Perseverance**  Ile Perseverance is one of the most recently reclaimed lands on the East Coast of Mahe. Located less than 3 km North of Victoria, the area has seen somerecent developments including the most extensive housing project ever undertaken in the Seychelles and also includes a newly built base for the Coast Guard and a school.  There is much evidence to suggest that prior to the reclamation and the creation of Ile Perseverance, the area in front of the island was a reef. This can be confirmed by the existence of a fringing reef, as well as remains of corals which usually make up a reef. There are several coral heads in the vicinity which appears to pre-date the reclamation era, suggesting that these colonies have survived both the bleaching and the sedimentation during the reclamation. Evidently there would have been some significant changes which have caused the structure and the composition of the reef in front of the island to change following the extensive reclamation in the area  Figure 2 below shows a typical shore in the Perseverance area. The abiotic composition reef flats are mostly consolidated coral limestone, dead patches with algae, sand and coral rubble. Although Perseverance is also a reclaimed area like Providence, there appears to be less silt on the reef flat. There are sparse live coral patches of species such as *Porites, Galaxea and Acropora*. Macro algae from the *Sargassum spp.*is quite a dominant feature on the reef flat and reef slope.  C:\Users\Rodders\Documents\consultancy\desal plant puc\middle labelled.jpg  Figure 2 – Ile Perseverance  Similarly, to Providence, the reclamation has caused significant damage to the natural ecosystem, which is slowly trying to recover from the various climatic and anthropogenic pressures. There are no highly sensitive ecosystems around the Perseverance site but the area has potential to eventually recover and a de-littering programme will help this process.  **Phase 3 - Glacis**  The coastline of around the Glacis site is dominated with granite boulders with several beach pockets in between the outcrops. Most of the corals are growing on the solid granite substrate with patches of consolidated limestone. Sand and rubble are dominant close to the inner shore with patches of reefs scattered along the site. There have been no recent scientific marine surveys conducted along this area and data is therefore limited. The site however, is similar to most rocky shores around the inner granitic islands with patches of mixed hard corals and macro algae growing on the rocks. Fish diversity consists of common reef species and some area may harbor high numbers of cryptic fish, which seeks shelter between the crevices of the granite boulders.  **Phase 3 - Bel Ombre**  The site is located in the North West part Mahe and is composed of a patchwork of reef. The area hosts several popular dive sites including a wreck site. Part of the original coastline of the area has also been reclaimed but not as extensively as Perseverance and Providence. Figure 3 below gives a view from the shore from a reclaimed island.  *C:\Users\Rodders\Documents\consultancy\desal plant puc\bel ombre\north labelled.jpg*  Figure 3 – Bel Ombre reclaimed area  The inner shore of the site varies from several small beach pockets to artificial granite embankments. Being former reef flats before the reclamation, consolidated limestone along with a mixture of sand and rubble make up most of the area in front of the reclaimed land. Low coral cover and sand tend to be more dominant on the gentle reef slope with an increase in coral cover out towards the sea. As previously mentioned, the reef at Bel Ombre is made of patches of reefs with mostly sand between the reef patches. Common Genii of corals that can be observed in the area includes *Acropora, Alveopora, Blastomussa, Echinopora, Favites, Fungia, Galaxia, Leptoseris, Pavona, Pocillopora, Porites and Stlyllopora***.** Ichthyologic communities consist of common reef species such as Parrot Fish, Butterfly Fish, Surgeon Fish, Wrasse, Lizard Fish, Emperors and Groupers amongst others.  **The Clean-Up Exercise**  The clean-up will be undertaken by a team comprising of four experienced divers with PADI Advanced Open Water diving licenses. Three of the divers, Marcus Quatre, Dominique Thelermont, and Mervin Cedras, are sea cucumber divers. The fourth diver, yet to be chosen, will be very experienced technical diver.  The total area to be cleaned is divided into approximately 27,400 grids of approximately 100 m2 (10m x 10m) and systematically the dives will cover each grid square, with the divers taking note of the rubbish collected in each grid square. Collected rubbish shall be collected into separate clearly marked containers. Depending on the depth (estimated to be between 5 – 15m, most places less than 5m), given the amount of rubbish to be collected, it is expected that it would take on average 2 minutes to cover each grid. It is expected that the rubbish will be concentrated in certain areas such as amongst rocks and reefs rather than being evenly spread throughout the cleanup area. The divers will undertake a maximum of 3 dives per person per day (see Annex 3) adhering to the Health & Safety Protocol (Annex 1).  The dives will be planned in advance by the team, who will map out the areas to be covered. A reconnaissance dive prior to the clean-up will allow the team to assess which areas will be problematic to devise the appropriate strategy for the clean-up dives. A vessel will be rented for the dives along with all dive equipment from Big Blue Dive Centre.  During the dives the team members will take turns to take videos with a head mounted GoPro camera and video documentaries of the cleaning up exercises will be done throughout the project to show the public exactly what is happening and how bad the ocean pollution problem is around the main island.  Simultaneously with the cleaning up exercise, the team will engage in an education campaign through workshops and social media to raise awareness among fishermen (who are currently disposing a large quantity of waste at sea), youths and the general public about ocean pollution.  Using the video evidence gathered during the clean-up, the trio also plans to educate and inform the Seychelles Fishing Authority to make it mandatory for fishing vessels to return with all waste to shore.  Underwater clean-up activities and filming can potentially have negative Environment and Social impacts; namely:   * Potential disturbance to marine life/environment; * Potential damage to the ecosystem depending on where the rubbish is removed from (e.g. from coral reef, etc.); * Transport and disposal of potentially significant amount of rubbish collected; * Occupational health and safety (OHS): injuries or health risks; * Potential spills of oil and fuel. |

1. **Risks, mitigation measures and monitoring**

*Identify and list potential environmental and social risks associated to the project. For each of the identified risks proposed mitigation measures to mitigate these risks and develop indicators to monitor the implementation of the proposed mitigation measures.*

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| **Potential risks** | **Mitigation measures** | **Responsibility for implementation of mitigation measures** | **Indicators to monitor implementation of mitigation measures** |
| **Environmental risks** |  |  |  |
| **1.** Disturbance to marine life/environment (coral damage, habitat destruction, harm to marine species etc.) during collection of rubbish | **1.1.** Develop and implement a protocol (Annex 2) for the collection, transportation, storage and disposal of rubbish taking into account the different types of habitats involved where the rubbish will be collected (e.g. corals, mangroves, protected areas, etc.) and the types of rubbish that will be collected. | Consultant | **1.1.** Rubbish collection protocol provided and people trained in its implementation |
| **1.2.** Train the team in the rubbish collection, transportation, storage and disposal protocol | Environmental Consultant | **1.2.** % of staff involved in the project trained in the rubbish collection protocol |
| **2.**  Transport and disposal of significant amount of rubbish collected | **2.1.** Ensure all collected/removed rubbish reach designated disposal/recycling locations (*ensuring all waste is properly disposed at disposal or recycling location*) | Project Team | **2.1.** % of rubbish collected reaching recycling or disposal locations. |
| **3.** Potential spills of oil and fuel. | **3.1.** No tank fueling to be made at sea as much as possible. No contaminated bilge water to be discarded at sea. Portable/ extra tanks need to be secured. | Project Team | **3.1.** Safety briefings and check-ups before every trip: briefing is provided by team leader before departure. Safety check-ups is to be conducted i.e. fuel in tank is sufficient for the trip and extra tanks stored in a secure location on the boat.  **3.2.** In case of fuel spill the proponent should notify Seychelles Maritime Safety Administration or properly attend to the spill. |
| **Health and Safety risks** |  |  |  |
| **4.** Injuries to team members during dives | **4.1.** Develop a Health and Safety protocol | Consultant | **4.1.** Health and Safety protocol provided |
| **4.2.** Train team members in health and safety procedures in case of injuries during dives | Diving Instructor | **4.2.** % of members involved in the project informed in health and safety procedures |
| **5**. Contamination by COVID19 | **5.1**. Application of Seychelles National preventive/mitigation measures for COVID19 | Health Officer | **5.1.** % of members involved in the project informed on COVID19 health and safety procedures |

1. **Monitoring Plan**

*The objective of the monitoring plan is to ensure that the mitigation measures are properly implemented.*

* 1. **Data collection, analysis and report responsibilities**

*List personnel or organization responsible for collecting data related to monitoring indicators, processing data and reporting to the PIU.*

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| Environmental   1. Coral (or other elements of a critical habitats) damage during collection of rubbish    1. Protocol provided to SeyCCAT    2. Staff signatures acknowledging having received training in the protocol 2. Rubbish disposal    1. Data will be collected by the proponent and provided to SeyCCAT   3 Report any accidental fuel spills to SeyCCAT  Health and Safety  4. Injuries to team members   * 1. Protocol provided to SeyCCAT   2. Staff signatures acknowledging having received training in the protocol  1. Contamination by COVID19   5.1. Staff signatures acknowledging having received training in COVID19 health and safety procedures |

* 1. **Additional support (capacity building, resources etc.)**

*List the additional support that is required to ensure that the mitigation measures are properly being implemented.*

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| Environment 1.1 & Social 3.1   1. Development of protocols |

* 1. **Monitoring table**

*For every mitigation measures proposed, list the monitoring indicator, frequency of monitoring, responsible for monitoring and the associated cost. This will ensure early detection of conditions that require additional or alteration in mitigation actions, provide info on progress and results of mitigation.*

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| **Mitigation measures** | **Indicator** | **Frequency** | **Responsibility** | **Cost** |
| **1.1.** Develop & implement a protocol for rubbish collection, transportation, storage and disposal | **1.1.** The protocol | **1.1.** Once | **1.1.** Proponent | **1.1. Once** @ $ 35 |
| **1.2.** Train the team in the rubbish collection protocol | **1.2.** Number of trainings | **1.1.** Once upon a new team member joining | **1.1.** Proponent | **1.1.** Once provided no change in initial team @ $ 35 |
| **2.1.** Ensure all collected/removed rubbish reach disposal/recycling locations | **2.1.** Amount of rubbish transported and reaches designated recycling/disposal sites | **2.1.** Each time waste is collected, taken to temporary storage and then taken to disposal or recycling site | **2.1.** Proponent | **2.1.** At each disposal @ $ 35 |
| **3.1.** No tank fueling to be made at sea as much as possible. No contaminated bilge water to be discarded at sea. Portable/ extra tanks need to be secured. | **3.1.** Safety briefings and check-ups before every trip: briefing is provided by team leader before departure. Safety check-ups is to be conducted i.e. fuel in tank is sufficient for the trip and extra tanks stored in a secure location on the boat. | **3.1.** Each time the team is going at sea  **3.2.** In case of fuel spill the proponent should notify Seychelles Maritime Safety Administration or properly attend to the spill. | **3.1.** Proponent | **3.1.**Once before every trip @ USD 5 |
| **4.1.** Develop a Health and Safety protocol | **4.1.** The protocol | **4.1.** Once | **4.1.** Proponent | **4.1.** Once @ $ 35 |
| **4.2.** Train team members in health and safety procedures (first aid with CPR) | **4.2.** Number of trainings | **4.2.** Once upon a new team member joining | **4.2.** Proponent | **4.2.** Once provided no change in initial team @ $ 35 |
| **5.1.** Application of Seychelles National preventive/mitigation measures for COVID19 | **5.1.** Number of trainings | **5.1.** Once to the team | **5.1.** Proponent | **5.1.** Once @ $ 35 |

* 1. **Implementation schedule**

*Provide a schedule for implementation of the various mitigation measures and activities that will enable for the monitoring of the implementation of the mitigation measures.*

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| **Activity** |  |  | **Timeline of Activity** | | | | | | | | | | |
| Week | Feb 2021 | Mar 2021 | Apr 2021 | May 2021 | Jun 2021 | Jul 2021 | Aug 2021 | Sep 2021 | Oct 2021 | Nov 2021 | Dec 2021 | Jan 2022 | Feb 2022 |
| Mitigation measures & monitoring of the mitigation measures implementation | | | | | | | | | | | | | |
| **1.1** Develop & implement a protocol for rubbish collection, transportation, storage & disposal |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1.2.** Train the team in the rubbish collection protocol |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2.1** Ensure all collected/removed rubbish reach disposal/recycling locations |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3.1.** Safety briefings and check-ups before every trip: briefing is provided by team leader before departure. Safety check-ups is to be conducted i.e. fuel in tank is sufficient for the trip and extra tanks stored in a secure location on the boat. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4.1.** Develop a Health and Safety protocol |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4.2.** Train team members in health and safety procedures (first aid with CPR) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5.1.** Application Seychelles National preventive/mitigation measures for COVID19 |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. **Grievance Redress Mechanism**

In line with the World Bank safeguards policies, the SWIOFish3 project has developed a Grievance Redress Mechanism (GRM) to receive, process and respond to complaints from any person or group of people related to the project or is affected by its activities. The GRM is a system designed to answer questions, clarify doubts and resolve implementation problems and complaints of individuals or groups affected by SWIOFish3 project activities. GRMs are intended to be accessible, collaborative, efficient, and effective in resolving concerns through dialogue, joint fact-finding, negotiation, and problem solving. Grievances can surface at different stages of the project cycle. Some grievances may arise during the project design and planning stage, while others may come up during project implementation. In general, grievances that may be encountered in the implementation of the SWIOFish3 project can be grouped into three categories:

* Grievances related to the changes in access to resources through management plans;
* Grievances related to proponents and beneficiaries of the Blue Grants Fund (BGF) and Blue Investment Fund (BIF);
* Grievances related to issues encountered by local communities where project activities are occurring;

Individuals or groups affected by the SWIOFish3 subproject can;

* complete a “complaint form” which will be made available to the public to formulate their suggestions or complaints. These forms can be withdrawn at the District Administration offices, Seychelles Fishing Authority, Department of Fisheries, Department of Environment, Seychelles Conservation and Climate Adaptation Trust, Development Bank of Seychelles, Public Health Authority, Citizen Engagement Platform Seychelles, Department of Blue Economy and PIU office or download from the project website. Once completed, these forms can be deposited in complaint boxes.
* A line of communication will be made for the public so that they can transmit suggestions and complaints through a call or an SMS;
* Formal letters, emails can also be sent to the PIU;
* Suggestions or complaints can also be formulated during consultation meetings.

**Address:**

SWIOFish3 Project

c/o Department of Blue Economy

Victoria

Republic of Seychelles

**SWIOFish3 line:** +248 2827373

Annex 1

The Ocean Clean Up Project

Protocol for Health & Safety During Dives

1. Introduction

This Protocol for Health & Safety During Dives (the Protocol) describes the principles and procedures to be followed by The Ocean Clean Up Project (TOCUP) team during the dives for collection of waste, which will take place in the below specified areas around Northern Mahe.

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| Phase 1: East Coast/Providence  Area: 1,916,608 sqm | Phase 2: North East Coast  Area: 254,128 sqm | Phase 3: North West Coast  Area: 571,171 sqm |

The Protocol outlines how the dives for collection of rubbish within the water column and on the sea floor in the designated areas will be undertaken. It aims to ensure that the dives are undertaken in a safe manner that presents no danger to the divers while they go about collecting the rubbish as per the Protocol for Collection, Transportation, Processing and Disposal of Waste.

The Protocol includes the following:

* The procedures to be followed pre-dives, during dives and post dives;
* The procedures to be followed in case of accidents and emergencies during dives;
* The emergency contact numbers.

1. Procedures to be followed for safe dives
   1. Pre-dive

Divers should ensure they have good mental and physical fitness for diving. They should have the physical strength to function in the diving equipment, with a reserve capacity, both in the water and out. They should avoid being under the influence of alcohol when diving. They should not use drugs before diving unless cleared to do so by an appropriate health care professional.

As someone making challenging dives, they should have regular dive medical assessments to reduce their risk. They should also maintain their proficiency in diving skills, striving to increase them through continuing education. They should practice and review specific diving skills in controlled conditions after a period of inactivity using those skills, and refer to course materials, online sources, manufacturer recommendations and interactions with other active divers to stay current and refresh themselves on important information regarding topics that include, but are not limited to, decompression theory, equipment and procedures.

Before going on a dive, divers should ensure that they are familiar with the dive sites. If they are not familiar with a site, they should obtain a formal diving orientation from a knowledgeable, local source who is familiar with the site. They should gain experience with the local environment on shallow, no stop dives before making the more challenging dives, and, if diving conditions are worse than those in which they have previously experienced, postpone diving or select an alternate site with better conditions. They should only engage in diving activities consistent with their training and experience.

Before leaving shore, the dive team should inform an on-shore team member of their departure time, location for the planned dives, number and expected time of dives, and expected time of return. While still on-shore all divers should check their equipment, ensuring they have sufficient air for the planned dives. They should at this point start recording their dive on their Dive Log. They should ensure that the equipment that they will be diving with are complete, well-maintained, reliable, with which they are familiar. They should inspect it for correct fit and function prior to each dive.

They should use all the diving community accepted equipment required for the particular diving in which they engage. They should not use diving equipment for which they are uncertified to use. They should maintain all equipment in accordance with the manufacturer’s recommendations. They should only make modifications that the manufacturer authorizes the diver to make. They should not dive beyond the manufacturer’s rated depth and/or time limits for its equipment. They should always have at least two functioning life support systems to use to abort the dive if one fails.

Divers should adhere to the team diving philosophy on every dive. They should plan dives, including but not limited to, communications, procedures for reuniting in case of separation, and emergency procedures, with other team members. They should agree that the overriding mission of every dive is for the entire team to return safely. They should dive within a team, but be self-sufficient. They should honor the rule that any diver can abort any dive at any time for any reason.

Divers should plan overhead environment and decompression dives with ample life support reserve to handle unforeseen problems. They should be proficient in dive planning with decompression software and/or the planning mode of dive computers. They should have two diving computers per diver to provide decompression information. They should be qualified for, and use, high oxygen gas mixes to make decompression more efficient. They should limit maximum depth and stop time to their level of training and experience.

The vessel’s skipper should also undertake a check of all equipment and engines to ensure they are functioning and there’s enough charge/fuel for the proposed dives along with a reserve for any emergencies.

* 1. During dives

Divers should maintain proper buoyancy for the diving activity. They should maintain neutral buoyancy while underwater. They should be buoyant for surface swimming and resting, and, if diving in a negatively buoyant condition due to gas and equipment requirements, have at least two means of controlling buoyancy using low pressure inflation by a gas source. They should carry at least one visual and one audible surface signalling device (signal tube, whistle, mirror) when diving in open water. They should always dive with a Delayed Surface Marker Buoy or lift bag and reel to provide an emergency decompression line and to make their position visible from the surface.

Divers should always breathe properly while diving. They should never breath-hold or skip-breathe. They should avoid overexertion while in and underwater and dive within their limitations. They should recognize that the deeper they dive, the greater the effort required to breathe and the easier it is to overexert. They should use helium-based mixes to reduce gas density and effort of breathing when making deep dives.

Divers should stay within accepted gas narcosis limits and recognize that oxygen is considered a narcotic gas when determining narcotic limits. They should use helium gas blends, with the proper training, and accept the risks of helium diving, to reduce narcosis to within acceptable limits when making dives that would otherwise exceed those limits.

Divers should know and obey local dive laws and regulations, including fish and game and dive flag laws, and laws regulating access to dive sites.

Divers should accept that even with proper training, diving for this project will expose them to more hazards and potential risk than does recreational diving. Such hazards may include, but are not limited to, lack of direct access to the surface (whether from a physical barrier or decompression obligation) too much oxygen or too little oxygen, high carbon dioxide, gas narcosis leading to poor judgment and decisions, decompression sickness, diving negatively buoyant and difficulty managing problems due to overall task loading. Divers understand that if they cannot accept these risks on a particular dive, they shall not make the dive or will abort it if they already have begun. They further acknowledge that if they cannot accept the risks in general, they shall discontinue diving until they are able and choose to do so.

In between dives the team should contact the on-shore team member if there are any changes to the dive plan that they were previously advised of, in particular if the location of the dive changes.

While divers are under water the skipper and boat crew should always be monitoring the surface for any signs of danger or divers aborting dives.

* 1. Post dives

Once back on the vessel, divers should inspect all their equipment and complete their dive log. In the event that there was an accident or incident during the dive, after the immediate emergency has passed and the victim has been transferred into the medical care system, it is important that the team debriefs about the accident or incident, and assess its root cause, to put in place measures to prevent this from materialising again. A short report should be prepared once the team is back on shore and safe and sound, and forwarded to SeyCCAT.

Once back on shore the on-shore team members should be contacted to be advised that the divers have arrived safe and sound.

In the event that the dive happened with no specific indication of any problems, if any of the divers experience any of the symptoms of any dive-related medical problems, the diver should immediately contact Seychelles Hospital on 151 to request emergency assistance. The diver should either be transported to the emergency room at Seychelles Hospital or wait for an emergency vehicle to pick them up. Often times it may take less time to transport the person to hospital than to wait for an emergency vehicle.

1. Procedures to be followed in the case of emergencies
   1. No Contact with Dive Team

If a team has failed to return to shore or to make contact with the on-shore team member at the scheduled times, the on-shore team member should follow these procedures:

* Attempt mobile phone/ radio /satellite phone contact.
* Allow the prearranged grace period of 1 hour to elapse.
* If repeated communication attempts fail, the on-shore team member should make contact with the Coast Guard, providing all the information such as description of the vessel, time of last contact, last position and description of persons on board vessel.
  1. Dive team unable to contact land

Firstly, to avoid losing contact with land, it is necessary to ensure that all radio equipment, mobile phones and satellite phones are fully charged and functioning prior to leaving shore. Secondly, the team should ensure to have adequate food and water to deal with situations where they are unable to quickly return to shore, while waiting to be rescued. However, unless the GPS equipment has also failed, even without contact the team can safely return to shore and find assistance to contact the on-shore team member.

* 1. Failure of GPS equipment

In the instance that GPS equipment fails on the vessel but the team is able to see the shore and can navigate without the equipment, they should inform the on-shore team member while making way to shore. Should the vessel be too far from shore and the team members cannot locate their position, immediately the vessel should radio the Coast Guard on frequency and advise of the problem, the vessel’s last known location, vessel description and description of persons on-board. The skipper should then anchor and await instructions from the Coast Guard.

* 1. Engine failure

To avoid engine failure, the vessel owner should ensure that the engine is well maintained, serviced and has sufficient fuel for the trip along with reserve. However, in the event that the engine fails, the skipper should immediately drop anchor if he/she hasn’t done so and radio the Coast Guard on to advise of the problem, the vessel description, the vessel’s location and description of the persons on board, and await further instructions from the Coast Guard.

* 1. Dive related emergencies
     1. *Diver suspects/realises there is a problem with equipment or starts feeling unwell*

As soon as a diver suspects or realise that there is a problem with his/her equipment, or starts feeling unwell while under water, he should abort the dive and begin to surface slowly (around 9m per minute but no faster than 18m per minute unless the diver is running out of air), making safety stops every 5m for a minimum of 3 minutes.

If the diver feels that he/she may lose consciousness before reaching the surface by undertaking a safe ascent with safety stops, he/she should immediately inflate their floatation device and ascent as quickly as possible. If possible, the diver should signal to the other divers that he/she is in trouble and requires immediate ascent.

Once at the surface, if the diver is still conscious, he should use signalling devices to call for help from the vessel.

* + 1. *Diver notices another diver having problem with equipment or is losing/has lost consciousness*

There are many reasons why a diver might lose consciousness underwater. It may result from a lack of oxygen (hypoxia), a medical emergency such as a heart attack, an excess of carbon dioxide (hypercapnia) or an excess of oxygen (oxygen toxicity). Whatever the cause, there is a need to get the diver out of the water and into the hands of qualified medical professionals as quickly as possible.

The first thing the rescue diver(s) must check is whether the regulator is in the diver’s mouth and whether the diver is experiencing convulsions.

**Regulator in mouth**

If the diver’s regulator is in his/her mouth and he/she is experiencing convulsions, the rescue diver(s) should wait until convulsions have subsided before beginning ascent.

**Regulator not in mouth**

If the diver’s regulator is not in his/her mouth, rescue diver(s) should not attempt to put it back. The rescuer(s) should assess if they are able to surface quickly or have to make safety stops. The rescuer(s) should not undertake a direct ascent if this will place him/her/them at considerable risk. In this case the victim should be made positively buoyant and sent to the surface as quickly as possible, where the boat crew should be on the alert to pull him/her out of the water.

* + 1. *Boat crew notices diver surfacing quickly or floating on the surface with difficulty or unresponsive*

It is preferable to get the diver out the water as soon as possible before initiating rescue breathing. The diver should be placed a hard surface. The rescuer should immediately check for airway breathing and circulation. If there is no breathing, the rescuer should immediately initiate cardiopulmonary resuscitation (CPR) as per training and guidelines detailed further in this protocol. If there is no pulse/circulation, initiate CPR. Other members should immediately contact Seychelles Hospital on 151 and advise of the emergency, its nature, the victim and the nearest landing point for rendez-vous with an emergency vehicle for transportation to the nearest emergency facility. If there are no other persons to make the call, the rescuer should first contact the emergency services before commencing CPR.

Once all divers are on-board the vessel, the skipper or another diver qualified to safely take the vessel and persons on board to shore, should quickly make way to the rendez-vous point for the emergency vehicle to pick up the victim.

Upon stabilization of the victims, turn off their tank, keep their regulator dry, collect weights and their dive computer. The victim’s equipment should be kept separate from those of other divers. Dive profiles can be downloaded from dive logs, air quality can be assessed from diver’s tank. If it is not possible to quickly and safely recover the equipment then this should be ignored and instead the victim transported to shore as quickly as possible.

In the event that no-one on-board can bring the vessel to shore, the Coast Guard should be immediately contacted on frequency [frequency] and advised of the emergency and need for assistance. The Coast Guard should be advised of the boat’s location, description of vessel and description of persons on-board.

If, the victim commences breathing after CPR, he/she should be administered with 100% oxygen at a rate of 10l/minute, while the rescuers continue to monitor the airway breathing and circulation. He/she should be wrapped in a blanket or towel or other articles of clothing to be kept warm.

If the victim is conscious and alert, if they are capable of swallowing, administer water and 300mg of aspirin orally.

The victim may become unconscious or experience difficulty with breathing, confusion, lowered alertness, disorientation, unclear thinking, visual problems, paralysis, and chest pain. Make a note of these to inform the medical personnel at the rendez-vous and in the emergency room.

* + 1. *Diver or boat crew is injured*

Where a person is injured there may be external bleeding which may indicate a cut or piercing or there may be no visible bleeding. It is important that although no visible signs of injury are present that the dive is aborted and the injured victim taken to shore as quickly as possible to be dealt with by the medical services.

Where there is external bleeding, rescuers should assess the location and try to reduce the bleeding by application of a clean gauze or cloth on the injury. Maintain pressure if necessary to stop the bleeding. If there is rapid loss of blood, which is not stopping, rescuer should immediately contact Seychelles Hospital on 151 and advise of the emergency, its nature, the victim and the nearest landing point for rendez-vous with an emergency vehicle for transportation to the nearest emergency facility.

Once all divers are on-board the vessel, the skipper or another diver qualified to safely take the vessel and persons on board to shore, should quickly make way to the rendez-vous point for the emergency vehicle to pick up the victim.

In the event that no-one on-board can bring the vessel to shore, the Coast Guard should be immediately contacted on frequency [frequency] and advised of the emergency and need for assistance. The Coast Guard should be advised of the boat’s location, description of vessel and description of persons on-board.

* + 1. *Diver is stung/bitten during dive*

If the diver is capable of surfacing safely, he/she should signal to the other divers and commence a safe ascent. If he/she feels on-coming loss of consciousness, he/she should immediately inflate floatation device to reach the surface as quickly as possible, where the boat crew on watch should pick up the diver from the water. The procedure in above 3.5.3 should then followed in case the diver reaches surface unconscious.

Where the diver is able to surface safely on his/her own, once in the vessel, if any tentacles are still present or a sting mark can be found, the rescuer should remove the tentacles without injury to self, with saline rinse or forceps, then use hot water, vinegar or diluted ammonia to deactivate remaining nematocysts. The dive should be aborted and the diver brought to shore for medical attention.

In the event that the diver who was conscious now loses consciousness, the procedure in 3.5.3 should be followed and the victim brought to hospital as quickly as possible.

1. Dive related medical problems

While it is deemed that all trained divers should be well versed with the medical conditions that may develop as a result of diving, the major ones are described in this protocol so that divers can recognise the symptoms in themselves and in other divers if they so materialise. In case of noticing any of the symptoms detailed below during a dive, the dive should be aborted and the emergency procedure in above section 3.5 followed.

* 1. Decompression Sickness / The Bends

The body tissues absorb gas in proportion to the surrounding pressure (depth) and as long as the diver remains at pressure (depth), the gas presents no problem. If the pressure is released too quickly (surfacing too rapidly or omitting required decompression), the inert gas comes out of solution and forms bubbles in the tissues and blood stream.

Decompression sickness (bends) is the result of inadequate decompression following a dive. While immediate recompression is not usually a matter of life or death as with an air embolus, the quicker recompression is initiated, the better the rate and extent of recovery.

DCS results from inadequate decompression caused by:

* Rapid ascent- exceeding 18m/minute
* Omitted decompression/safety stop
* Ignoring pre-disposing factors, i.e., obesity, dehydration, cold-arduous dives,

It may also result from flying too soon after diving, or over-heating or overexerting after a dive.

The main symptoms of DCS are:

* Joint pain
* Extreme fatigue
* Paralysis, numbness
* Unconsciousness
* Dizziness, staggering

While these symptoms usually occur between 15 minutes and 6 hours after the dive, they can be delayed for up to 24 hours or more.

**Mild symptoms**

Mild symptoms may respond to oxygen treatment at the scene. Fatigue (mild), skin rash, and weakness are considered a minor symptom, but frequently require recompression and are handled as a severe symptom. If the diver surfaces from a dive and behaves in an unusual manner, appears confused, or has fatigue, weakness or skin rash, he may have early symptoms of a diving accident.

Immediately treat the diver for shock and administer oxygen. Oxygen treatment often relieves the symptoms or prevents them from getting worse. The victim will probably deny the possibility of having a problem and may refuse oxygen. Good judgment should prevail and the diver should receive treatment. If the symptoms appear relieved after an interval of oxygen treatment, do not remove the oxygen immediately as the symptoms may recur. The victim should continue to receive 100% oxygen for as long as the supply will last.

**Severe symptoms**

Severe symptoms consisting of joint pain, weakness or paralysis, staggering, respiratory difficulties or unconsciousness require immediate treatment and evacuation into the hyperbaric trauma system. Cardiopulmonary resuscitation (CPR) and/or the use of an Automated External Defibrillator (AED) will be required if the victim has no pulse or respiration.

If a person at any time within 24 hours after a dive shows any severe symptoms, immediately provide the victim with oxygen and treat for shock. Monitor pulse and respiration until evacuation to the recompression chamber has been accomplished. It is important to remember that because these signs and symptoms can develop hours after diving, it is important for paramedics and physicians to recognize the symptoms and to understand this problem so that the proper procedure can be initiated. It is also extremely important that any person delivering a diving accident patient to a medical facility provide those caring for the patient with full information concerning the accident.

**DCS may be prevented by**

* Not diving if dehydrated, hung-over, intoxicated, overly fatigued or cold
* Making conservative use of dive tables, including safety stops, slow ascents, and longer surface intervals. If the diver is over-weight, he/she should be even more conservative in using tables
* Avoiding exertion and over-heating after a dive, (hot showers/hot tubs, excessive anchor retrieval)
  1. Arterial Gas Embolism (AGE)

If a diver surfaces without exhaling, air trapped in the lungs expands and may rupture lung tissue releasing air bubbles into the circulatory system where they may be distributed to the body tissues. The ascending diver is normally in a vertical position and the bubbles tend to travel upward toward the brain, eventually reaching a small artery blocking circulation. The effects of halting circulation to the brain are critical and require immediate treatment. Symptoms of embolism may be present when the victim reaches the surface or within a few minutes afterwards.

Causes of AGE:

* Holding breath during ascent while breathing compressed air
* Lung disease causing air trapping
* Diving with flu, cold or chest congestion
* Airway obstruction by foreign object in the mouth such as gum

Symptoms of AGE include:

* Unconsciousness within 3-5 minutes of surfacing from a dive
* Dizziness, staggering
* Visual disturbances
* Paralysis
* Bloody froth from the mouth/nose
* Respiratory arrest

Note: Symptoms usually appear within 15 minutes after surfacing.

AGE may be prevented by:

* Divers always breathing normally during ascent
* Divers getting periodical medical examination by a hyperbaric physician
* Avoiding dives when sick with flu, cold or chest congestion
* Not chewing gum, tobacco, etc. while diving
  1. Pneumothorax, Mediastal Emphysema, Subcutaneous Emphysema

**Pneumothorax**

Air enters the chest cavity causing lung(s) to collapse.

**Mediastal Emphysema**

Air released into tissues surrounding the heart.

**Subcutaneous Emphysema**

Air trapped under skin around neck.

Causes of Pneumothorax, Mediastinal Emphysema and Subcutaneous Emphysema

* Holding breath during ascent while breathing compressed air
* Lung disease causing air trapping
* Diving with flu, cold, chest congestion
* Airway obstruction from foreign object in the mouth; gum, etc.

Symptoms of Pneumothorax, Mediastinal Emphysema and Subcutaneous Emphysema

* Shortness of breath
* Sharp pain in chest
* Rapid shallow breathing
* Blueness of skin, lips, fingernails
* Lungs sound different from one side to the other

Preventing Pneumothorax, Mediastinal Emphysema and Subcutaneous Emphysema

* Divers should always breathe normally during ascent
* Divers should get periodical medical examination by a hyperbaric physician
* No diving when sick with flue, cold or chest congestion
* Not chewing gum, tobacco, etc. while diving
  1. Carbon Dioxide Excess

Causes:

* Over-exertion
* Skip breathing
* Hyperventilation; improper breathing pattern
* Loss of air supply

Symptoms:

* Labored or rapid breathing
* Headache, dizziness, weakness, nausea
* Unconsciousness

Prevention:

* Stop, rest, breathe normally, surface if breathing becomes labored
* Avoid causes listed above
  1. Carbon Monoxide Excess

Cause:

* Inhalation of engine exhaust gasses

Symptoms:

* Labored or rapid breathing
* Blue lips/fingernails
* Headache, dizziness, weakness, nausea
* Unconsciousness

Prevention:

* Do not breathe air contaminated with engine exhaust
  1. Stinging Injuries

Cause:

* Stings from: Sponges, Corals, Jellyfish, Man-O-War, Fire Worm

Symptoms:

* Itching, Burning
* Redness and swelling, welts

Prevention:

* Avoid marine organisms with stinging potential
* Wear proper protective gear

1. Procedure for Cardiopulmonary Resuscitation

In instances that any team member experiences an accident or for whatever reason stops breathing, the rescuer is required to follow the below procedure:

Before starting CPR, check:

* Is the environment safe for the victim?
* Is the person conscious or unconscious?
* If the person appears unconscious, tap or shake his or her shoulder and ask loudly, "Are you OK?"
* If the person doesn't respond and two people are available, one person should call 151 while the other person begins CPR.
* If you are alone and have immediate access to a telephone, call 151 before beginning CPR.

The American Heart Association uses the letters C-A-B — compressions, airway, breathing — to help people remember the order to perform the steps of CPR.

**Compressions: Restore blood circulation**

1. Put the person on his/her back on a firm surface.
2. Kneel next to the person's neck and shoulders.
3. Place the heel of one hand over the center of the person's chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands.
4. Use your upper body weight (not just your arms) as you push straight down on (compress) the chest at least 2 inches (approximately 5 centimeters) but not greater than 2.4 inches (approximately 6 centimeters). Push hard at a rate of 100 to 120 compressions a minute.
5. If you haven't been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical personnel take over. If you have been trained in CPR, go on to opening the airway and rescue breathing.

**Airway: Open the airway**

If you're trained in CPR and you've performed 30 chest compressions, open the person's airway using the head-tilt, chin-lift maneuver. Put your palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.

**Breathing: Breathe for the person**

Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can't be opened.

1. With the airway open (using the head-tilt, chin-lift maneuver), pinch the nostrils shut for mouth-to-mouth breathing and cover the person's mouth with yours, making a seal.
2. Prepare to give two rescue breaths. Give the first rescue breath — lasting one second — and watch to see if the chest rises. If it does rise, give the second breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver and then give the second breath. Thirty chest compressions followed by two rescue breaths is considered one cycle. Be careful not to provide too many breaths or to breathe with too much force.
3. Resume chest compressions to restore circulation.
4. As soon as an automated external defibrillator (AED) is available, apply it and follow the prompts. Administer one shock, then resume CPR — starting with chest compressions — for two more minutes before administering a second shock. If you're not trained to use an AED, an emergency medical operator may be able to guide you in its use. If an AED isn't available, go to step 5 below.
5. Continue CPR until there are signs of movement or emergency medical personnel take over.

Adapted from <https://www.mayoclinic.org/first-aid/first-aid-cpr/basics/art-20056600>

1. Five Minute Neurological Exam

Where a victim of an accident or incident is conscious and responsive, the below 5-minute neurological exam courtesy of Ed Thalmann, M.D., may be followed

1. **Orientation:**

Does the diver know name and age? Location? What time, day, or year it is? Note: Even though a diver appears alert, the answers to these questions may reveal confusion, so do not omit them.

1. **Eyes:**

Have the diver count the number of fingers you display using two or three different numbers. Check each eye separately and then together. Have the diver identify a distant object. Tell the diver to hold head still, or you gently hold it still, while placing your other hand about half a metre in front of the face. Ask the diver to follow your hand with his eyes. Move your hand up, down, side to side. The diver’s eyes should smoothly follow your hand and should not jerk to one side and return. Check that pupils are equal in size. Note: Often AGE victims have different dilation in one eye then another. Also look for nystagmus (fluttering of the eyes either vertically or horizontally). This is a sign of neurological problems with the vertical fluttering being associated with more severe damage.

1. **Face:**

Ask the diver to whistle. Look carefully to see that both sides of the face have the same expression while whistling. Ask the diver to grit the teeth. Feel the jaw muscles to confirm that they are contracted equally. Instruct the diver to close the eyes while you lightly touch your fingertips across the forehead and face to be sure sensation is present and the same everywhere.

1. **Hearing:**

Can be evaluated by holding your hand about two feet from the diver's ear and rubbing your thumb and finger together. Check both ears, moving your hand closer until the diver hears it. Check several times and confirm with your own hearing. If the surroundings are noisy (i.e. a crowded beach), the test is difficult to evaluate. Ask bystanders to be quiet and turn off unneeded machinery.

1. **Swallowing reflex:**

Instruct the diver to swallow while you watch the Adam's apple to be sure that it moves up and down.

1. **Tongue:**

Instruct the diver to stick out the tongue. It should come out straight in the middle of the mouth without deviating to either side.

1. **Muscle Strength:**

Instruct the diver to shrug the shoulders while you bear down on them to observe for equal muscle strength. Check the diver's arms by bringing the elbows up level with the shoulders, hands level with the arms, and touching the chest. Instruct the diver to resist while you pull the arms away, push them back, up and down. The strength should be approximately equal in both arms in each direction. Check leg strength by having the diver lie flat and raise and lower the legs while you gently resist the movement.

1. **Sensory Perception:**

Check on both sides by touching as done on the face. Start at the top of the body and compare sides while moving downwards to cover the entire body. The diver's eyes should be closed during this procedure. The diver should confirm the sensation in each area before you move to another area.

1. **Balance and Coordination:**

Be prepared to protect the diver from injury when performing this test. Have the diver stand up with feet together, close eyes and stretch out arms. The diver should be able to maintain balance if the platform is stable. Your arms should be around, but not touching the diver. Be prepared to catch the diver who starts to fall. Note: If the diver is already messed up you may want to avoid this one if he can't even stand. Check coordination by having the diver move an index finger back and forth rapidly between the diver’s nose and your finger held approximately half a metre from the diver's face. Instruct the diver to slide the heel of one foot down the shin of the other leg. The diver should be lying down when attempting this test. Check these tests on both right and left sides and observe carefully for unusual clumsiness on either side.

1. Emergency Contact Procedure

The below two emergency services should be alerted without delay based on the emergency detailed in the previous sections.

|  |  |
| --- | --- |
| Seychelles Hospital Accident & Emergency | **Telephone 151** |
|  |  |
| Seychelles Coast Guard | **Telephone 4 290900**  **Radio Channel 16** |

When advising of the emergency situation be prepared to provide the following necessary information

* Who are you
* What’s the emergency
* Where are you located
* What assistance do you need
* Victim’s details:
  + Name
  + Age
  + Sex
  + Location of victim
  + Vital Signs / Temperature
  + Pulse (Weak or Strong)
  + Breathing (Regular or Labored)
  + Treatment in Progress (Oxygen / CPR) and time commenced.
  + What symptoms they are experiencing and the time of onset of the symptoms

It is important that the person contacting the emergency services remain calm and provide as much information as requested by the emergency service personnel. The same information may be required to be repeated to the personnel in the emergency vehicle and again at the emergency room. As such the person accompanying the victim to the emergency room should have all these details in mind or noted at hand.

Annex 2

The Ocean Clean Up Project

Protocol for Collection, Transportation,

Processing and Disposal of Waste

1. Introduction

This Protocol for Collection, Transportation, Processing and Disposal of Waste (the Protocol) describes the principles, procedures and management of the waste collected by The Ocean Clean Up Project (TOCUP) which will take place in the below specified areas around Northern Mahe.

|  |  |  |
| --- | --- | --- |
|  | | |
| Phase 1: East Coast/Providence  Area: 1,916,608 sqm | Phase 2: North East Coast  Area: 254,128 sqm | Phase 3: North West Coast  Area: 571,171 sqm |

The Protocol outlines how rubbish within the water column and on the sea floor in the designated areas will be collected, segregated, transported and processed. The potential environmental impact of moving such waste from the water and sea bed, where they are collected, to Mahe, and processing it on Mahe is considered and addressed in this Protocol. It also outlines the measures that will be undertaken by TOCUP to ensure that all collected rubbish is processed as far as possible and suitably disposed if it is not possible to re-use, recycle or repurpose.

The Protocol aims to ensure that the collection of rubbish in the designated sea areas is done in an ecologically conscious manner, which is aligned to Seychelles’ national framework on waste management as far as possible. Based on the observations by the project team members on many dives, it is expected that a large percentage of the waste to be collected is plastic objects washed into the sea from rivers and rainwater runoff drains, and dragged along by ocean currents, as well as waste dumped by fishing vessels.,.

While the project desires to process as much of the rubbish collected, based on the lessons learned from the Aldabra Clean Up Project, the TOCUP team expects that much of the waste would be too degraded for processing.

Any waste generated by the project itself will be collected, transported, processed and disposed as per the Protocol. The project itself will generate emissions of Carbon Dioxide and while this cannot be avoided, it may be minimised by switching off vessel engines while dive operations are taking place.

The Protocol includes details on the following:

* The goal of the project to collect at least one ton of rubbish from the designated areas. The team estimates that they will collect mostly single use plastic items such as straws, bags, and bottles; household items and fishing gear (mostly nets stuck in corals);
* The actual process of collecting the rubbish;
* Monitoring of the effectiveness of the project;
* The waste types and method for processing.

1.1 Project description

This project is one of many that have emerged as a response to the global issue of ocean plastic. By collecting rubbish from areas close to the shore where people tend to frequent and showing them what’s being pulled out of the ocean, TOCUP hopes to bring awareness to the population, in particular the younger generation, of the extent of the ocean plastic problem through workshops. It is expected that by sensitizing the younger generation about the problem, they will be more willing to be part of the solution and do their part to reduce incorrect disposal of waste on land, which eventually end up in the sea.

Further, the project aims to lobby the Seychelles Fishing Authority to make it mandatory for licensed fishing vessels to return all their rubbish to land for proper disposal, in a bid to reduce the amount of waste going into the ocean as a result of fishing activities.

1.2 Potential environmental and social impacts

Removal of rubbish from the sea obviously makes it cleaner for the marine life as well as for the recreational users. However, it is expected that currents may bring back rubbish in the areas cleaned over the longer term. The biggest impact expected from the project is the social aspect of instigating the necessary change in mindset as people see the extent of ocean plastic in the water surrounding our islands.

1.3 Waste management implementation approach.

Goals and objectives.

The overall goal of this Protocol is to ensure that a ton of rubbish from select marine areas along the North Coast of Mahe is removed to be transported to a designated temporary storage location to be reused, repurposed and recycled as much as possible.

To ensure this goal is achieved the Protocol has these below objectives:

1. Ensure that all collected waste arrives to the designated temporary storage location without been loss en route (at sea);
2. Ensure that all collected waste that arrives at the temporary storage site is handled safely and does not re-enter the environment;
3. That the collected waste is reused, repurposed and recycled as much as is realistically possible through the active engagement and encouragement of artists, businesses and organisations, both locally and internationally.

Responsibility for collection, transportation and disposal

The project team members shall be entirely responsible for collecting the rubbish from the sea, transporting to the designated temporary storage site, where once a sufficiently large volume to be disposed of is available, appropriate transportation will be hired to transport the rubbish to the disposal site at Providence.

The processing of the rubbish collected will be the responsibility of the project team members, who will be assisted by LWMA and other interested and relevant stakeholders such as artists, local and international processing companies.

Estimate of waste types and quantity

|  |  |  |
| --- | --- | --- |
| **Waste type** | **Expected Percentage of Total Weight** | **Examples** |
| Plastic items | 40% | Toys, flip flops, etc |
| Plastic packaging | 45% | PET bottles, packets of biscuits, chips, crisps, etc |
| Glass & ceramic | 5% | Glass bottles |
| Metal | 5% | Cans |
| Others | 5% | Nets, fishing lines |

Description of recycling/reuse methods for each material

|  |  |  |
| --- | --- | --- |
| **Waste type** | **Target** | **Description** |
| Fishing gear | 90 % | Any fishing gears in good state may be reused by fishermen. |
| Single use plastics | 50% | The established local market for plastic bottle recycled will be used to ensure the maximum amount of PET bottles will be reprocessed. |
| Glass and ceramic | 100% | Can be used in art projects. |
| Metal waste | 100% | Can be used in art projects |

Waste collection, storage, transport and disposal.

The team of 4 divers will be undertaking dives in the proposed areas to collect rubbish from the water column and sea floor. Rubbish collected will be put in gunny bags and brought to the surface to be temporarily stored on the vessel that have brought the divers to the dive site. Once the dive is complete, the gunny bags of rubbish will be brought to a temporary storage area (yet to be identified), where the rubbish will be classified based on state of deterioration and potential re-usability. The project team will seek to find persons, in particular artists, to re-use/recycle those items that could be re-used (metal, glass & ceramic) based on their findings. Items that cannot be re-used will be piled and once a large enough quantity is reached, a pickup will be rented to transport the rubbish to the landfill. The rubbish will be transported to the landfill in gunny bags that are well secured to the vehicle to avoid loss during transportation.

***Re-use:*** Collected waste such as rope, buoys and other fishing gear that is of good quality will be distributed to relevant entities (marine conservation organisations) and (tourism and fishing) businesses operating within the inner islands. Waste that cannot be reused will either be repurposed or recycled;

***Repurpose:*** If collected waste cannot be reused in their present form but could be used in a different form, they will be sent to recycling or labelled as future recycling. This will involve local processors deciding on the type of waste they can process (PET, HDPE and PPP) and possibly exporting such waste to make value added products. Residual waste that cannot be repurposed will be recycled.

***Recycle:*** Residual waste will be either made into artistic pieces.

***Landfill:*** If the above options cannot be satisfied then the only alternative left is to send the residual waste to landfill. Under no circumstances will biological or non-biological waste be dumped into the ocean or surrounding environment.

Progress Tracking

The project team members will quantify and communicate the types of waste collected throughout this project by recording this in log book to be kept in the vessel at all times and in social media posts. The progress of what is re-used, repurposed and recycled will be monitored in weight and volume and final product used for/in.

Handling

The divers will wear gloves while undertaking the waste collection. All divers must have a currently valid tetanus vaccination.

Clean Up Strategy

**Routine**

**Dive days**

Preparation for dives will commence at 08:00hrs on the dive day with divers’ arrival at the rendez-vous with the vessel. The responsible team member will ensure that all diving equipment have been collected from the diving equipment hirer and transported to the rendez-vous point. The team and skipper will have a briefing to describe the dive location and strategy to undertake the operation. Divers will check in with their health status and decide how to proceed.

Each team member will need to be responsible for bringing their own supply of water, snacks, sun screen along, with anything else they may require.

Between 2 to 3 dives will be undertaken by each diver during the day depending on depth, sea conditions, health of the divers, among other parameters. The next section describes how the rubbish collection operation will take place.

After all dives are completed, the rubbish collected will be transported to the temporary storage site. The team will discuss the challenges and issues they faced during the dives and plan the next steps. We will send footage from the filming of the dives to the social media consultant to edit and upload to social media accounts for the project.

**Other days**

On days that the project team members are not diving they will be occupied with sorting the rubbish collected, identifying parties that would be interested to re-use, re-purpose and recycle those items that have been identified as good enough for same and organising for disposal at the landfill of those items that cannot be reused.

Workshops will also be organised to occupy these other non-diving days, where the project team members will be going to tertiary education institutions to discuss ocean pollution and show them evidence of rubbish from footage obtained during the dives.

**Rubbish Collection Operation**

The dive site to be chosen for the operations will be based on the wind direction. For example, during South East Trades it makes more sense to choose a dive site that is in the more sheltered Beau Vallon area (phase 3 sites), while during the North West Monsoon the sites on the North East and East coast will be chosen.

Each site will be separated into grids of approximately 10m x 10m. Rubbish collected in each grid will be placed in gunny bags that will be labelled with the grid reference. This will permit the project team to pin-point to a 10m accuracy of the location of the rubbish collected. Each bag will be recorded in the waste collection log, which will be weighed at the temporary storage facility and the contents sorted and weighed.

Annex 3

**Calculations and Project Schedule**



