CORAL TRANSLOCATION REGULATIONS

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ENVIRONMENT DEPARTMENT

ENVIRONMENT, HEALTH AND SAFETY (EHS) DIVISION

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1.0 Permits and Licenses for Coral Translocation

1.1 Application Process

This particular regulation presents the authority of EHS over activities related to allowable coral translocation covering, but not limited to, 1.) collection and handling, 2.) mobilization and transport, 3.) recipient site selection, 4.) survival monitoring and documentation and, 5.) reporting.

Approval and issuance of permit/license shall be processed up to a maximum of five (5) working days after the review process, field validation / inspection and other procedures of EHS. Issuance of permit will be after the translocation proponent's acceptance of the permit conditions and payment of tariffs assigned by EHS based on its standard tariff rates.

Infrastructure projects in areas with identified coral patches should apply for Coral Translocation Permit from EHS before commencing with activities like dredging, reclamation etc. that can affect the existing corals.

1.2 Application Attachments

a. Baseline Report

b. Justification of the need for the coral translocation activity

c. Receiving site viability report

d. Photographs during baseline or any other relevant studies

e. Detailed plan for translocation activity

f. Manpower

g. Equipment

h. Transportation Plan / Facilities

i. Maintenance and care plan

j. Monitoring plan

k. Emergency plan

l. Public acceptance evidence

1.3 Baseline Study

A comprehensive study to provide a profile of coral system (e.g. inventory of species, number of colony, location etc.) shall be conducted by the translocation proponent. Baseline report should reflect a general description of the general condition of the immediate surrounding, information on health condition (e.g. area with partial mortality, blanched/bleached portions etc.) Other pertinent information that should be provided by the report should include general information on the original site like water temperature, salinity, current flows, depth, and turbidity among others. During this baseline study, coral colonies intended for community translocation should be tagged for reference and identification. Individual corals on the other hand intended for selection and relocation should be inventoried and recorded. List of required studies for source and transfer sites include, but not limited to:

a. Ecological baseline study (fish and other source inventory)

b. Water quality monitoring

c. Area scanning (utilization of site e.g. industrial site with STP discharge points etc.)

d. Others

The condition of the tagged corals should be recorded by taking photographs of good resolution to represent the health status of the colony prior to the relocation. The information presented in the study shall be used as basis in evaluating success and survival of the trans-located coral colonies. Photo documentation can be done for representative specimens for individual translocation while wide-ranging documentation can be done with community translocation.

Other information such as fish species inventory should also be done both for the donor and receiving sites. This will be used as basis as to how the relocated corals will help in the recruitment and improvement of diversity especially in the relocation site.

Public consultation should also be conducted and included in the baseline information as justification for the application.

1.4 Allowable Coral Translocation

Permit and applicable EHS license/s to legitimize coral translocation activity shall be issued for purpose/s allowed by EHS with justifiable reasons beneficial in assuring the health of the coral system and the marine biodiversity in general.

Permits can be granted for translocation activity, which intends to relocate healthy or affected corals due to possible threats posed by priority infrastructure projects of the Government. Other allowable activities covered by this regulation shall include coral enhancement, protection from sedimentation and destruction from dredging and reclamation project. Scientific study is also an allowed activity given a justifiable objective and an assessed genuine intent to further studies on corals. The proponent shall provide a final document of the scientific endeavor to EHS after the study before clearance can be granted. No other activity other than those presented herein shall be granted permit/license by EHS.

This regulation covers translocation of hard, reef building corals species as well as solitary (individual) coral species threatened by anthropogenic (man-related) activities.

2.0 Translocation Plan

An important document to be submitted and evaluated by EHS for provision of permit/license is a comprehensive Translocation Plan. This document should contain in detail all procedures employing standard and acceptable practices to assure high survival rate of the corals proposed for translocation. All translocation activities must be conducted using the most up to date practices as they should apply to local, national and international standards, including that of EHS, on coral translocation.

The plan must be submitted with the specific information on, but not limited, to the following:

- Qualifications of person/team leading the translocation project
- Dive team composition
- Translocation methodology (e.g. community or individual corals etc.)
- Specific means of translocation (e.g. collection to deployment)
- Locations of origin and receiving area
- Equipment/materials (toxin-free fixing agents such as *Carboline* Epoxy etc.) to be used
- Timeframe
- Monitoring
- Emergency protocols (accident response, back-up equipment etc.)

The detailed translocation plan should be drafted during the detailed design stage of the project. Phases of the activity should be presented in the plan where important pre-requisite and best and acceptable practices should be specified.

The translocation plan should be in agreement with the condition of the permit and other relevant studies review of EHS and other authorities and should be authorized prior to the commencement of coral translocation activity and monitoring program. A qualified marine specialist who has suitable coral knowledge and sound experience in identifying corals in field situation should carry-out both coral translocation and monitoring exercise.

3.0 Collection and Handling

Permit/license to be issued by EHS will be highly dependent on important procedures to assure survival of the corals proposed for translocation. This particular subject of this regulation would look into the method and acceptable practices on the manner the corals will be collected and handled. The proponent of the translocation activity should determine the methodology to be implemented, whether community or individual coral collection will be done as required by the circumstances (e.g. nature of corals, type of substrate form collection site etc.)

Whatever methodology will be propose, this should assure that the approach will lessen the damage that can decrease the chance of survival and growth rates in transplanted colonies or individual corals because of increased stress that results in susceptibility to disease.

Healthy, diverse species of corals including *acroporas*, soft and solitary corals are chosen for translocation.

4.0 Display and Interaction Standards

Facilities and other special requirements are required for the transport facility to bring the corals from its pre-location to its receiving site. Cranes and other lifting equipment should be provided to assure easy lifting while lessening unnecessary movements and abrasions that can damage the corals, should community of corals will be trans-located. Baskets or ropes to hold the corals submerged under water on the side of a slow-moving tag boat are tested methods for relocating individual or small boulder communities.

Speed of the barge/boat to transport the corals should also be observed not to exceed 4 knots during transport to lessen hydrodynamic stresses that go with velocity. While the transportation will be in a controlled speed, it should be observed that the entire procedure is completed in a short period especially if transported corals are exposed to the stresses of temperature, wind and other elements that can be detrimental to the condition of the relocated corals.

Methods of transport and needed equipment should vary with many considerations like the species transported (example: *Acropora gemmifera* and *Favia stelligera* are species which can be transported out of water for up to 2 hours while *Stylophora pistillata* or *Rumphella* species should be transported submerged in water), temperature , distance of source to destination site among others.

5.0 Actual Transplanting / Deployment

As critical and important as the collection and transport activity, actual transplanting and deployment of corals should be done with care to minimize abrasions and crushing to avoid mortality. A diver should guide actual deployment where corals will be strategically positioned considering, but not limited to the following: distance from other coral boulders, orientation for better photosynthetic activity etc.

Trans-located boulders should be aggregated (closely positioned) rather than dispersed with a recommended distance of 1 to 3 meters be used depending the size of the boulder. The minimum distance of 1 meter will ensure that contact abrasion between adjacent coral-covered rocks is minimized during placement. The suggested 3 meter-distance on the other hand is in recognition of the "broadcast" (expansive) spawning characteristics of most corals where larger distance would limit the success of fertilization and subsequent reproductive result. These distance standards will maximize potential for future colonization of the surrounding rock by juvenile corals.

Deployment should follow the specific designs contained in the translocation plan executing activities that closely duplicate the natural condition of the corals in its original site including depth, orientation among others.

6.0 Receiving Site

Proper selection of receiving site would play an important part in assuring and determining success of translocation activity. Factors such as water quality, temperature, degree of sediment, salinity, depth and bottom illumination among others should be looked at during the selection of a suitable site. No translocation activity should commence without the proper in-depth study of proposed receiving site. EHS has the right to recommend for a laboratory testing/analysis to test water quality.

The transplant site should have environmental conditions including orientation very similar to the site where the corals are originally from. Given this, there will be lesser adjustments and adaptation and recuperation of trans-located corals will be easier resulting in a higher rate of survival.

Sites to be proposed to receive the corals are highly recommended to be within Dubai World sites and other EHS recommended areas. Should identified transfer site is outside this areas, legal documents and authorization from other statutory authorities concerned and authorized in the proposed site. Requirements for sites outside Dubai World and JAFZA area include, but are limited to:

- No Objection Certificate (NOC) from other Authorities (e.g. DM, Ministry of Environment and Water, Environment Agency of Abu Dhabi, Federal Environmental Agency)

- Other authorization/permits required

7.0 Survival Monitoring / Documentation

After translocation, the transplanted coral colonies should be regularly checked by qualified marine ecologist(s) for reporting to EHS for four (4) years which is scheduled monthly for the first three (3) months and quarterly for the remaining period of forty-five (45) months after transplantation. Detailed monitoring plan should be drafted during the detailed design phase of the project for approval by EHS prior to the commencement of coral translocation.

Dive surveys for post-translocation monitoring should collect the same information for tagged corals as the baseline survey. Information gathered during each post-translocation monitoring survey should include observations on the presence, survival, and health conditions of the transplanted coral colonies. It should also include conditions of the surrounding environment as well as weather, sea and tidal conditions.

Each tagged coral should be photographed maintaining the same orientation as photographs taken during the baseline survey. Representative photographs should be taken if method of transplanting was for individual corals. After the translocation, periodic photographs should reflect recuperation, growth or death of relocated corals which will be used as basis for evaluation and physical evidence to measure success or failure of the project.

All tags should be removed / retrieved after the monitoring program is completed.

Frequency of Visits – visits should be done at least monthly for the first three (3) months and quarterly thereafter for two (2) years of regular monitoring work by an EHS accredited coral translocation-monitoring third party. This independent group will provide progress report to closely-monitor developments of the trans-located corals including but not limited to the status of the trans-located corals; survival rate; growth; species such as fish, invertebrates and other species attracted to the area among other relevant findings.

8.0 Reporting

A baseline survey conducted by a third party accredited by EHS should be submitted to the authority with the application form prior to the commencement of coral translocation exercise. The document will be used as basis for approval and as benchmark to measure developments of the project later.

Post-translocation monitoring reports should be submitted to EHS within 2 weeks after the completion of coral translocation and each quarterly coral monitoring survey. The results of the post-translocation monitoring surveys should be reviewed with reference to the baseline survey results and findings of the condition of surrounding environment.

Progress reports should be submitted to EHS for updating purposes and inclusion in documentation such as scientific journals, presentations etc.

9.0 Safety of Records

All baseline study, periodic reports, photo documentation and back-up files of conducted progress monitoring should be in the active file of the proponent for an indefinite timeframe. This is to assure that records will be available to justify post-activity status of relocated corals should there be situations that may result in mortality caused by other activities later on.

Files should be readily available and retrievable at all times and open for accessing by the Authority within a seven (7) year period.

10.0 References

- Coral species diversity and environmental factors in the Arabian Gulf and Gulf of Oman: A comparison to the Indo-Pacific Region
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  Smithsonian Institution / Washington, D.C., U.S.A. / August 2003

- Manual for Restoration and Remediation of Coral Reefs
  Edited by Makoto Omori and Shuichi Fujiwara / March 2004
  Nature Conservation Bureau / Ministry of the Environment, Japan

- Coral Reef Resilience and Resistance to Bleaching
  Gabriel D. Grimsditch and Rodney V. Salm
  IUCN / The World Conservation Union

- Dubai Pilot Project: Test Report for “Reef Systems” at The Palm Jumeirah
  By Christopher C.E. Hopkins

- Coral Relocation from the Dubai Dry Docks: Recommended Transplantation and Monitoring Methods
  By John Burt / Natural Science and Public Health, Zayed University

- Coral Relocation Project in Kaneohe Bay, Oahu, Hawaii
  By Paul L. Jokiel, Ku’ulei S. Rodgers and Fred Farrell
  Coral; Reef Assessment and Monitoring Program (CRAMP)
  University of Hawaii / Hawaii Institute of Marine Biology
  April 22, 2005