Agreement No. CE 56/2008(CE)

Site Formation for Kai Tak Cruise Terminal Development - Design and Construction

Second Post-Translocation Coral Monitoring Report

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LIST OF ABBREVIATIONS

AFCD	Agriculture, Fisheries and Conservation Department
ArchSD	Architectural Services Department
CEDD	Civil Engineering and Development Department
DEP	Director of Environmental Protection
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EP	Environmental Permit

1 INTRODUCTION

1.1 General

The main purpose of this Report is to document the field activities, results and findings of the Second Post-translocation Coral Monitoring Survey conducted on 15th December 2009. The health, condition and size of translocated plus reference *Oulastrea crispata* colonies located within and adjacent to the coral recipient site at Tseung Kwan O were individually assessed. The findings of the Second Post-translocation Coral Monitoring Survey are presented with comparison of the Baseline and First Post-translocation results. This Second Post-translocation Coral Monitoring was completed successfully in accordance with the Final Detailed Coral Translocation Plan (1) and the detailed mitigation measures documented in the approved EIA Report, Environmental Monitoring and Audit (EM&A) Manual (EIA 138/2007) and Environmental Permit and variation (EP-328/2009 and VEP-289/2009).

1.2 Description of the Project

1.2.1 Civil Engineering and Development Department (CEDD) have commissioned Scott Wilson Ltd under Agreement No. CE 56/2008(CE) to undertake design and construction supervision for the site formation works for Kai Tak Cruise Terminal Development at the former Kai Tak Airport in the southeastern region of Kowloon Peninsula (the Project). After closure in 1998, the disused airport site has been occupied by various temporary uses, including a golf driving range and has been subjected to a number of proposals to redevelop the site with change usage.

1.2.2 The Project comprises the following key components.

(a) Site Formation Works

- demolition of the existing seawall;
- construction of Edge Structures and Transition Edge Structures;
- formation and construction of an Apron Area, including the provision of trough & pit systems for installation of Apron Facilities by others;
- formation of the Designated Areas including provision of piled quay deck structures and upgrading of existing seawalls;
- installation of fender and mooring facilities, navigation aids and apron drainage; and,
- dredging of seabed and fairways.

(b) Environmental monitoring and implementation of mitigation measures in association with the above.

1.2.3 In the original Project Brief, Temporary Infrastructure will be required to facilitate the operation of the Phase I Berth in mid 2013. However, based on the current programme and development, Architectural Services Department (ArchSD) will bring forward the

(1) Scott Wilson Ltd and ERM (2009). Detailed Coral Translocation Plan for Site Formation for Kai Tak Cruise Development - Design and Construction.

construction programme for the Cruise Terminal Building such that the required facilities for the operation of the Phase I Berth will be provided by the newly constructed Cruise Terminal Building. As a result of this, the provision of the Temporary Infrastructure will not be required and the design of the site formation works including the edge structures and seawalls will be carried out on this basis.

1.2.4 The development layout plans are presented in *Figure 1.1*.

1.2.5 A number of environmental studies have been carried out at the site as part of the masterplanning and Environmental Impact Assessments required under the Environmental Impact Assessment Ordinance (EIAO). These include:

- The Environmental Appraisal Report for the Cruise Terminal;
- EIA report (*EIA-139/2007*) for the decommissioning of the Former Kai Tak Airport Other than the North Apron – approved on 19 December 2007;
- EIA report (*EIA-138/2007*) for Dredging Works for the Proposed Cruise Terminal at Kai Tak – approved on 19 December 2007; and,
- EIA Report (*EIA-157/2008*) for the Kai Tak Development – approved without conditions on 4 March 2009.

1.2.6 An Environmental Permit (EP) has been obtained by CEDD for Dredging Works for the Proposed Cruise Terminal (EP-328/2009), which links directly to the EM&A measures set out and agreed in the approved EIA-138/2007.

1.2.7 The marine ecological impacts associated with the Project identify the potential for direct loss of habitat and associated marine life due to the dredging activities and demolition of the existing seawall required for the formation of the new cruise terminal. With respect to the mitigation of potential impacts, a specific requirement of the approved EIA-138/2007 is the need to undertake coral translocation from the impacted area to an identified site in Tseung Kwan O. The requirements for coral translocation have also been set down in the Environmental Permit for Dredging Works and the subsequent variation (EP-328/2009 and VEP-289/2009).

1.2.8 As required under Agreement No. CE 56/2008 (CE) and Environmental Permit No. EP-328/2009, the coral translocation works comprise three phases of works:

i. Preparation of a detailed Coral Translocation Plan, including the results of a pre-translocation surveys for the Kai Tak (donor site) and proposed coral recipient site (Tseung Kwan O);

ii. Execution and documentation of the coral translocation exercise; and

iii. The implementation and documentation of a post-translocation coral monitoring programme over a period of 12 months.

1.3 Objectives for the Second Post-translocation Coral Monitoring Survey

1.3.1 The objective of the Second Post-translocation Coral Monitoring Survey was to document and assess the health and condition of the coral colonies moved from Kai Tak to Tseung Kwan O at regular quarterly intervals and this survey following on the First Post-Translocation Coral Monitoring Survey completed in September 2009. Data from this Second Post-translocation Coral Monitoring Survey were collected for two purposes:

- To assess translocated coral condition six months after the translocation works; and,
- To collect a robust dataset to track the temporal status of the translocated and reference coral colonies (*Oulastrea crispata*) in terms of health dynamics. Reference to the Baseline (immediately following the coral move) and First Monitoring Survey results will be made.

1.4 Structure of the Report

1.4.1 Following this introductory section (Section 1), the remainder of this Second Post-translocation Coral Monitoring Report is structured as follows:

Section 2: Detailed description of the coral monitoring approach and methodology utilised for this specific survey.

Section 3: Presentation of the findings for the Second Post-translocation Coral Monitoring Survey including the health status, condition and size of the translocated and reference coral colonies assessed in December 2009.

Section 4: A summary and discussion of the key results of the Second Post-Translocation Coral Monitoring Survey and the schedule for the next survey assessment.

2 SECOND POST-TRANSLOCATION CORAL MONITORING METHODOLOGY

2.1 General

2.1.1 The main objective of the post-translocation coral monitoring programme was to track the health and condition of the translocated corals at the Tseung Kwan O recipient site once every three months over a period of one year [(1)]. The Second Post-translocation Coral Monitoring Survey was carried out on 15 December 2009 following the baseline assessment conducted on 19 June 2009, immediately following the translocation works, and the First Post-translocation Coral Monitoring Survey completed in September 2009.

2.1.2 The corals removed from the seawall of the Former Kai Tak Runway and transferred to Tseung Kwan O were placed within the established recipient site located as shown in *Figure 2.1*. A total of 72 boulders containing 157 colonies of *Oulastrea crispata* were placed inside a pre-established underwater rope grid (1 m^2 grid cells) secured with metal bars on two sides. The condition of each translocated coral was assessed during the Baseline coral translocation survey and the majority of *O. crispata* colonies were in good condition exhibiting no stress or damage that was attributed to the translocation works. The occurrence and percentage cover of partial mortality per coral colony was generally low for both the translocated and reference *O. crispata* colonies.

2.1.3 The set-up of the underwater grid reference was found destroyed by typhoons in the September survey. As such, most boulders with corals were re-orientated and re-positioned in small aggregations within the recipient site. Given the need to stabilise all the Kai Tak boulders/rocks and aid the relocation of these boulders for the subsequent post-translocation monitoring the remaining scattered boulders were re-positioned and placed together with the boulder aggregations in the Second Monitoring Survey. The location of all 72 boulders/rocks with corals in the underwater grid is presented in *Figure 2.2* for the First and Second Post-translocation Monitoring Survey. The figure shows the approximate position of the boulders/rocks for both of the two surveys.

2.1.4 The condition and health status of each translocated and reference coral were re-assessed six months after the translocation work. Representative photographs were taken of each living coral colony and used to estimate the size of individual coral colonies for the post-translocation assessment and monitoring. Full details of the field methodology are presented in the following sub-sections.

2.2 Monitoring of Coral Health Status

2.2.1 All coral colonies for each recovered boulder were assessed visually and notes were recorded on the standard parameters measured. The following standard coral health parameters were recorded *in-situ* for each translocated coral colony (as detailed in the EM&A Manual (EIA-138/2007) and the Final Detailed Coral Translocation Plan):

- The number and size of all hard coral colonies for each translocated boulder/rock.
- The existing surface area (percentage cover) of each coral colony that exhibited partial mortality.

(1) Scott Wilson 2009. Final Detailed Coral Translocation Plan. Prepared by ERM for CE 56/2008 (CE) Site Formation for Kai Tak Cruise Terminal Development - Design and Construction.

- The existing coral surface area bleached of which two categories were recorded: a. blanched (ie pale) and b. bleached (ie whitened) with the bleaching parameter recorded as a percentage cover estimate of the total coral colony area.

- Each coral colony was also assessed for sediment cover including the percentage cover of the colony affected and the colouration, texture and approximate thickness of sediment on the coral colony and adjacent substrate. Any contiguous patches of sediment cover >10 % were recorded.

2.3 Monitoring of Growth and Change in Cover of *Oulastrea crispata*

2.3.1 The coral monitoring survey programme established the additional collection of data allowing the growth and change in coral size of individual *Oulastrea crispata* colonies to be tracked over the 12 month period of post-translocation monitoring. Photographs at a standardised height from each coral colony were taken at the time of the baseline coral translocation survey. Due to poor visibility conditions during the First Post-translocation Coral Monitoring Survey a series of close-up photographs of the individual coral colonies were recorded with a scale bar included in all photographs. Despite much improved underwater visibility during this Second Post-translocation Coral Monitoring Survey the close-up photographic capture approach was maintained.

2.3.2 The coral images were then digitally analysed post-survey using the Coral Point Count (CPCe) software (http://www.nova.edu/ocean/cpce/). The health parameter data collected in the field was verified with the examination of the individual photographs. In addition, the size (maximum diameter and area) of each coral colony was extracted from the coral images after scale calibration for each image had been carried out.

2.4 Reference Corals

2.4.1 To distinguish natural variation in the health status and the general condition of the *Oulastrea crispata* colonies as opposed to stress possibly induced by the translocation works, a random suite of *O. crispata* colonies within and adjacent to the recipient site were also included in the monitoring programme. A total of 40 randomly selected *O. crispata* colonies referred to as 'reference corals' were monitored using the same methods as for the translocated colonies to assess their health status (ie partial mortality, bleaching and sediment cover) and photographs of each individual colony for verification of the conditions of the coral and size estimation.

2.4.2 Coral health data obtained for the reference colonies will be collected on each post-monitoring survey occasion and used to compare with the coral condition of the translocated coral colonies. It is expected that the general health condition of the translocated and reference Oulastrea crispata colonies will be similar.

3 RESULTS AND FINDINGS

3.1 Introduction

3.1.1 The Second Post-translocation Coral Monitoring Survey was conducted on 15 December 2009. The survey objective was to repeat the translocation monitoring (as conducted for the Baseline and First Post-translocation Coral Monitoring) to assess the health and condition of the corals moved from Kai Tak in June 2009.

3.1.2 On 15 December 2009, the prevailing weather was overcast with light rain and cool temperature. There was a moderate easterly wind (Force 3) and a slight swell. Underwater visibility was moderate (~ 3 m) and sufficient for the survey. The dive survey work was carried out during a flood tide [(1)].

3.2 Coral Results

General

3.2.1 All 72 translocated boulders/rocks were relocated and a thorough examination of each boulder/rock for the *Oulastrea crispata* colonies translocated from Kai Tak was carried out. The results are presented in relation to the three surveys completed to date, ie, Baseline, First and Second Post-Translocation Monitoring Surveys. All *O. crispata* colonies (ie, 157 coral colonies as recorded in the Baseline Post-translocation Coral Monitoring Survey, June 2009) were accounted for (living or dead) and an additional three and ten new *O. crispata* coral recruits were recorded in September and December 2009, respectively (*Table 1* and *2)*. In addition, a total of 40 reference *O. crispata* colonies were randomly selected and assessed, 20 of which where located within the recipient site and 20 colonies along the area of the reference transect. All coral colonies were photographed (as described in *Section 2.3*.1) and these images are presented in *Annex A*.

Translocated Coral Health and Condition

3.2.2 In December 2009, of the 157 coral colonies (as recorded for the Baseline Monitoring Survey), representing the original collection of translocated corals moved from Kai Tak in June 2009, a total of 101 (64 %) corals were alive but 56 (36 %) had died. Translocated coral survivorship had declined ~11 % from 75 % (as recorded in September) to 64 % in December 2009 (*Table 3*).

3.2.3 In general, approximately half of the living translocated *Oulastrea crispata* colonies (48 %, 48 out of 101 live coral colonies) were in good condition showing no visual signs of damage or stress in December 2009 (*Table 4*). The remaining 53 *O. crispata* coral colonies (52 %) exhibited varying levels of partial mortality (ranging from 5 to >50 %) and/or sedimentation. Twenty-four coral colonies (24 %) were recorded with <50 % partial mortality and only five colonies (5 %) showed ≥ 50 % partial mortality. A total of 24 coral colonies (24 %) were affected by sediment (generally ≥10 % of the surface area of the individual coral colony), seven of which exhibited both partial mortality (<50 %) and sedimentation.

Overall Coral Health and Condition

3.2.4 In December 2009 (ie, Second Monitoring Survey) the health and condition of 170 coral colonies (representing translocated colonies plus recruits) was assessed (live versus dead coral colonies) and detailed records made for the live coral colonies (% partial mortality,

(1) http://www.weather.gov.hk/tide/eWAGtext2009.htm. Accessed on 7 December 2009

bleaching and sediment cover). The results are presented in *Table 2* and revealed that 113 colonies (66 %) of the *Oulastrea crispata* coral colonies were alive (including ten new coral recruits, *Figure 3.1*) and 57 colonies (34 %) had died. These included 35 colonies which exhibited total mortality at the time of the First Monitoring Survey and are now considered as permanently lost (ie no potential to recover due to being completely overgrown by turf and coralline algae and fouling organisms) and 22 colonies (including a recruit detected in September 2009) which had died since the first monitoring survey in September 2009 (*Table 2*). It was noted that four coral colonies from different boulders (Tags 28, 44 46 and 62) which had exhibited total mortality in September (First Monitoring Survey) were observed to have partially recovered at the time of the December survey 2009 (*Figure 3.2*). Coral transplants located in the shallow sub-littoral were observed to be more prone to overgrowth by turf and coralline algae and bio-fouling organisms (ie, tube worms and barnacles) on dead coral surfaces which both obscured the coral skeleton (particularly in situations of high partial mortality (or even total mortality)) and inhibited the recovery of the coral colonies.

Focused Explanation on Translocated Corals and New Recruits Exhibiting Reduced Partial Mortality in December 2009

3.2.5 Fifteen out of 78 (19 %) coral colonies had recovered from the partial mortality recorded in September 2009 with these coral colonies now in good condition. Thirteen out of 78 (17 %) coral colonies that had exhibited partial mortality in September showed partial recovery, ie, a reduction in the percentage partial mortality when examined in December 2009. This was recorded as a decrease in partial mortality (% estimate of surface area) from >70 % (for the majority of coral colonies) to partial mortality estimates ranging from 5 to 30 %.

Focused Explanation on the Fate of Healthy Translocated Corals and New Recruits between September and December 2009

3.2.6 It was also noted that a total of 24 out of 43 coral colonies recorded as healthy in September 2009 remained in good condition in December 2009. Eight coral colonies had suffered total mortality in the period between September and December 2009. A further 11 exhibited partial mortality and/or sedimentation. Out of the 11 colonies, four corals exhibited partial mortality of 5 %, 10 %, 20 % and 40 %, respectively. Furthermore, four colonies were affected by sedimentation (ranging from 5-10 %) with the majority (75 %) recorded with an estimated 5 % sediment cover and three colonies exhibited both partial mortality and sedimentation (5-30 % and 10-30 %, respectively).

Focused Explanation on the Condition of the Translocated Corals that had Suffered Total Mortality between September and December 2009

3.2.7 Of the 22 dead *Oulastrea crispata* colonies recorded in December 2009 (including a recruit detected in September 2009), 64 % (14 colonies) had already suffered partial mortality and/ or some level of sediment cover in September 2009. Of which, seven colonies exhibited high levels of partial mortality (≥ 50 %) when examined previously in September 2009.

3.2.8 The health status of the individual *Oulastrea crispata* coral colonies is detailed in *Table 6*. *Figure 3.3* shows the representative photographs of *O. crispata* coral colonies recorded during the Baseline Survey immediately following the translocation works (June 2009), and the First (September 2009) and Second (December 2009) Post-translocation Coral Monitoring Surveys. Details for each translocated coral colony recorded on all the translocated and tagged boulders/rocks for the Baseline Post-translocation Survey (June 2009) are presented in *Annex B* for the readers' reference.

Reference Coral Health and Condition

A total of 40 reference corals were assessed for the status of their health and condition. These corals (located within the recipient site and along the reference transect, just outside the recipient site) showed a higher number of coral colonies affected by sedimentation as compared to the translocated Kai Tak coral colonies (introduced to the recipient site at Tseung Kwan O) (*Table 5*). Seventy and forty percent of the assessed *O. crispata* within and outside the recipient site, respectively, exhibited varying levels of sediment cover (ranging from 5 to 50 %). The total number of coral colonies within and outside the recipient site exhibiting different levels of partial mortality, however, was relatively low (5 %) as compared to the translocated coral colonies and partial mortality for all reference corals was < 50 % of the total surface area of the individual coral colonies..

Number and Size of Oulastrea crispata *Colonies*

3.2.9 The estimated size of individual translocated coral colonies are presented in *Table 6*. The diameter of *Oulastrea crispata* ranged from 0.4 to 12.7 cm and the estimated total area of individual coral colonies ranged from 0.1 to 60.0 cm^2, a size spectrum representing possible recruits to adult colonies. The average size (area estimate) of the translocated coral colonies was 6.1±0.8 cm^2. The size of individual colonies will be recorded in all future monitoring surveys to track growth rates and changes in live coral cover of the *O. crispata* colonies.

3.2.10 The size of the reference *Oulastrea crispata* coral colonies are presented in *Table 7*. The size of the reference colonies within the recipient site and along the reference transect ranged from 0.8 to 3.4 cm in diameter with average size (estimated area) of 1.7±0.2 cm^2 (ranging from 0.3 to 6.3 cm^2).

Brief Comparative Analyses of the Results for the First and Second Post-Translocation Coral Monitoring Surveys

3.2.11 The health and condition status of the living translocated *Oulastrea crispata* in September and December 2009 was compared (refer to *Figure 3.4*). A number of key observations were made as follows:

- The percentage of healthy coral colonies (ie, corals showing no stress signals such as partial mortality) increased from 36 % in September to 51 % in December 2009.
- The level of estimated partial mortality (<50 %) exhibited by the living coral colonies remained the same (22 %) from September to December 2009.
- The level of estimated partial mortality (> or = 50 %) exhibited by the living coral colonies showed large reduction 23 % to 4 % from September to December 2009.
- The estimated coral colonies surface area covered in sediment was similar for the two monitoring surveys, ie, 19 % and 22 %, respectively (as recorded in September and December 2009).
- These above results for the specific health and condition parameters indicate that the translocated corals (plus new recruits) within the recipient site at Tseung Kwan O are exhibiting an overall improvement in condition as recorded for the December 2009 results.

4 SUMMARY AND DISCUSSION

4.1.1 All 72 translocated boulders/rocks were relocated and a total of 157 *Oulastrea crispata* colonies (as recorded for the Baseline Monitoring Survey) plus additional three and ten newly discovered coral colonies (recorded in First and Second Monitoring Survey, respectively) were individually assessed during the Second Post-translocation Coral Monitoring Survey conducted on 15 December 2009. Out of 157 translocated *O. crispata* coral colonies 101 (64 %) were recorded alive and 56 (36 %) coral colonies had suffered total mortality. Approximately half of the living translocated *Oulastrea crispata* colonies (48 %, 48 out of 101 live coral colonies) were in good condition showing no visual signs of damage or stress (*Table 4*). The remaining 53 *O. crispata* coral colonies exhibited varying levels of partial mortality (ranging from 5 to >50 %) and/or sedimentation.

4.1.2 A summary of the key findings on the coral mortality and recovery records for the Second Post-translocation Coral Monitoring is presented below:

- Coral Survivorship of 157 translocated corals from Kai Tak was 64 % in December 2009, a reduction from the 75 % reported in September 2009.
- Fifteen out of 78 (19 %) coral colonies had recovered from the partial mortality recorded in September 2009 and these coral colonies were reported to be in good condition.
- Thirteen out of 78 (17 %) coral colonies exhibited partial mortality in September 2009 showed partial recovery, ie, a reduction in the percentage partial mortality recorded in September 2009. This was recorded as a decrease in partial mortality (% estimate of surface area) from >70 % (for the majority of coral colonies) to partial mortality estimates of 5 – 30 %.
- Four coral colonies were the exception to the rule and though recorded as having suffered total mortality in September 2009, these corals had partially recovered by December 2009.
- Ten new *Oulastrea crispata* colonies were recorded within the recipient site and on the boulders moved from Kai Tak in December 2009.
- Results for the specific health and condition parameters indicate that the translocated corals (plus new recruits) within the recipient site at Tseung Kwan O are exhibiting an overall improvement in condition as recorded for the December 2009 results.

4.1.3 The health and condition of the 40 reference corals which were located within the recipient site and along the reference transect were assessed and they showed a slightly lower occurrence in partial mortality estimates and a similar trend in estimated sediment cover. The majority of reference *O. crispata* (> 70 %) was recorded with partial mortality (~5 %) and/or sediment covering a portion of the coral colony (ranging 5–50 %). The general health condition of the translocated and reference *Oulastrea crispata* colonies was similar.

4.1.4 The main contributing factor to the extended record of coral mortality of the translocated coral colonies would appear to be the physical disturbance to the site (as recorded in September 2009) resulting from the spate of typhoon conditions in late summer 2009. While some corals recovered quickly from the physical damage, for others, the damage manifested later and resulted in partial mortality. Furthermore, the corals that did survive but suffered high partial mortality were possibly not able to fully recover as a result of competition with

fouling organisms in upper depths of the recipient site or the higher sedimentation regime in the lower depths of the recipient site.

4.1.5 The recipient site was positioned to encompass the optimal local conditions, ie where *Oulastrea crispata* colonies occurred naturally, as recorded during the baseline survey. What could not be accounted for (as the baseline survey was a snap-shot in time) but is now being reflected in the temporal monitoring data are the actual fluxes in population dynamics of the corals and other benthic organisms. Much of these changes are no doubt reflecting natural dynamics but as mentioned the disturbance to the site from the typhoons is most likely still impacting the benthic community life-history dynamics. Although, no definitive response can be made about whether the translocation process itself has led to the mortality of coral colonies moved from Kai Tak it is noted that given the immediate success of the coral translocation, that other processes (storm induced perturbation to the site and natural fluxes in population dynamics), are most likely the primary causative factors in the present coral survivorship records. We consider it also important to note that a total of thirteen new coral colonies have colonised on the boulders moved from Kai Tak after the translocation work indicating that the site conditions are optimal for coral colonisation and growth.

4.1.6 Further monitoring and site maintenance will continue on a quarterly basis. Reference corals (of the same species) will be assessed for their status and condition at each of the remaining two post-translocation coral monitoring surveys (March and June 2010). A minimum of 20 coral colonies within and adjacent to, the recipient site will be assessed at the same time as the corals translocated from Kai Tak. An extension of the post-translocation coral monitoring may be a consideration if required to justify that the observations of coral mortality were due to the typhoon. Further monitoring would permit a better understanding of the rates of mortality for these translocated corals, the impact of natural perturbations affecting this particular coral species and the rates of recovery.

4.1.7 The data collected from the Second Post-translocation Coral Monitoring Survey will serve as the third of the temporal monitoring datasets to be collected during the 12 month post-translocation monitoring programme. The condition of the translocated corals will be further assessed in future surveys which will be conducted every three months (ie quarterly) and the next monitoring survey will take place in March 2010.

Tables

Table 1: Summary Table of Translocated *Oulastrea crispata* Colonies recorded on the 72 Boulders/ Rocks during the Pre-translocation Survey (April 2009), immediately following the Coral Translocation Works (Baseline June 2009), 1st Post-Translocation Survey (September 2009) and 2nd Post-Translocation Survey (December 2009).

Tag Number	No. of Live Corals Recorded in Pre-Translocation Survey – April 20 09	No. of Live Corals Recorded during Coral Translocation (Baseline Survey - June 2009)	No. of Live Corals Recorded during Coral Translocation (1st Monitoring – Sept. 2009)	No. of Live Corals Recorded during Coral Translocation (2nd Monitoring - Dec. 2009)
1	2	1	1	1
2	1	1	1	0
3	1	3	2	1
4	1	1	1	1
5	1	2	1	0
6	1	2	1	1
7	1	1	1	0
8	2	2	2	2
9	2	2	2	1
10	1	1	1	1
11	1	5	5	6
12	1	1	1	1
13	1	1	1	2
14	2	3	2	4
15	3	3	3	3
16	1	1	0	0
17	3	3	2	0
18	1	1	1	0
19	1	1	1	1
20	1	1	1	1
21	1	1	1	0
22	2	2	2	1
23	2	4	4	4
24	2	3	2	2
25	2	2	0	0
26	2	2	1	1
27	1	4	5	5
28	1	1	0	1
29	1	1	1	1
30	1	3	3	2
31	3	5	5	5
32	2	1	1	1
33	1	1	1	1
34	1	1	1	1

Tag Number	No. of Live Corals Recorded in Pre-Translocation Survey – April 20 09	No. of Live Corals Recorded during Coral Translocation (Baseline Survey - June 2009)	No. of Live Corals Recorded during Coral Translocation (1st Monitoring – Sept. 2009)	No. of Live Corals Recorded during Coral Translocation (2nd Monitoring - Dec. 2009)
35	1	1	1	0
36	2	2	1	1
37	2	2	1	0
38	1	3	3	2
39	1	1	1	1
40	3	3	2	2
41	2	2	2	1
42	2	2	3	0
43	2	2	0	0
44	2	2	1	2
45	4	4	4	2
46	2	2	1	2
47	1	1	1	1
48	3	3	4	4
49	1	1	1	1
50	1	1	1	1
51	1	1	1	1
52	2	5	2	2
53	1	2	1	2
54	4	7	2	2
55	1	1	1	1
56	2	2	2	2
57	1	1	1	2
58	1	2	2	3
59	2	2	2	1
60	1	1	1	0
61	2	2	2	2
62	2	2	1	2
63	2	3	2	3
64	2	2	1	1
65	1	1	1	1
66	4	5	2	2
67	5	5	3	3
68	1	1	1	1
69	2	2	2	2
70	3	3	3	5
23B	-	4	3	3
40B	-	4	1	1
Total	**120**	**157**	**121**	**113**

Table 2: A Summary Table of the Translocated *Oulastrea crispata* Colonies during the Baseline, First and Second Coral Post-Translocation Surveys (completed in 2009).

Survey	# Live Corals	# New Coral Recruits	# Dead Coral Records	# Recently Dead Coral Records	Total	Coral Survivorship *
Baseline Monitoring (June 09)	157	-	-	-	**157**	**100 %**
First Monitoring (September 09)	118	3	-	39	**160**	**75 %**
Second Monitoring (December 09)	103	10	35**	22***	**170**	**66 %**

*Percentage estimate calculated using the number of live corals plus the new coral recruit data.
**In December 2009, four corals out of the 39 recorded as dead in September had partially recovered.
***Note of the 22 dead coral colonies one colony was a new recruit recorded in September 2009.

Table 3: A Summary Table of the fate of the Translocated *Oulastrea crispata* Colonies (157) Recorded during the Baseline, First and Second Coral Post-Translocation Surveys (completed in 2009).

Survey	# Live Corals	# Dead Coral Records	Total	Coral Survivorship
Baseline Monitoring (June 09)	157	-	**157**	**100 %**
First Monitoring (September 09)	118	39	**157**	**75 %**
Second Monitoring (December 09)	101	56	**157**	**64 %**

Table 4: A Summary Table of the Health and Condition of the Living Translocated *Oulastrea crispata* Colonies (a total of 101 colonies) as recorded for the First and Second Coral Post-Translocation Surveys (September and December 2009).

Living Coral Assessed (number of colonies and relative percentage)		Healthy Coral showing no sign of stress	Coral with partial mortality (< 50 % cover)	Coral with partial mortality (>= 50% cover)	Affected by sediment	Coral with partial mortality (< 50 % cover) and affected by sediment	Coral with partial mortality (>= 50 % cover) and affected by sediment
1st Monitoring							
Colony Number	118	41	26	28	12	10	1
Percentage	100%	35%	22%	24%	10%	8%	1%
2nd Monitoring							
Colony Number	101	48	24	5	17	7	0
Percentage	100%	48%	24%	5%	17%	7%	0%

Table 5: A Summary Table of the Overall Health and Condition of the Reference *Oulastrea crispata* Corals Assessed in December 2009.

Corals assessed (number of colonies)		Healthy Coral showing no sign of stress	Coral with partial mortality (< 50% cover)	Coral with partial mortality (≥ 50% cover)	Affected by sediment	Coral with partial mortality (< 50 % cover) and affected by sediment
Inside Recipient Site	**20**	5	1	0	11	3
Percentage	**100%**	25%	5%	0%	55%	15%
Reference Transect (outside recipient site)	**20**	12	0	0	7	1
Percentage	**100%**	60%	0%	0%	35%	5%

Table 6: Summary Table of the *Oulastrea crispata* Colony Health Status for each tagged Boulder/Rock for the First (September 2009) and Second Post-Translocation Coral Monitoring Assessment (December 2009).

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
1	1	7.5	1.6	80	-	-	-	-	1.5	-	-	-	-	Recovered
2	2	1.0	1.7	80	-	-	-	-	0	100	-	-	-	-
3	3	2.5	0	100	-	-	-	-	0	100	-	-	-	-
3	4	-	1.1	30	-	-	-	-	1.4		-	-	-	Recovered
3	5	-	1.8	*	-	-	-	-	0	100	-	-	-	-
4	6	4.0	3.4	20	30	-	-	-	3.5	5	20	-	-	Partially Recovered
5	7	5.5	2.7	90	-	-	-	-	0	100	-	-	-	-
5	8	-	0	100	-	-	-	-	0	100	-	-	-	-
6	9	-	0	100	-	-	-	-	0	100	-	-	-	-
6	10	2.5	3.4	50	-	-	-	-	1.3	20	-	-	-	-
7	11	6.5	2.1	*	-	-	-	-	0	100	-	-	-	-
8	12	2.5	7.2	5	-	-	-	-	6.2	-	-	-	-	-
8	13	1.5	2.5	-	-	-	-	-	3.2	-	-	-	-	-
9	14	7.0	6	*	35	-	-	-	7.6	-	30	-	-	Partially Recovered
9	15	4.5	5.1	10	-	-	-	-	0	100	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
10	16	2.5	3.9	20	-	-	-	-	3.4	-	-	-	-	-
11	17	-	1.5	-	-	-	-	-	1.5	-	-	-	-	-
11	18	3.0	2	20	-	-	-	-	1.9	-	-	-	-	Recovered
11	19	-	1.5	-	-	-	-	-	3.4	5	-	-	-	-
11	20	-	0.8	-	-	-	-	-	1.4	-	-	-	-	-
11	21	-	1.5	-	-	-	-	-	3	-	-	-	-	-
11	22	-	-	-	-	-	-	-	0.9	-	-	-	-	New Recruit
12	23	4.0	5.6	20	-	-	-	-	4.2	5	-	-	-	-
13	24	4.5	2.4	90	-	-	-	-	2.2	10	-	-	-	Partially Recovered
13	25	-	-	-	-	-	-	-	0.5	-	-	-	-	New Recruit
14	26	3.5	3.3	*	-	-	-	-	3.2	-	5	-	-	-
14	27	-	4	5*	-	-	-	-	4.9	10	-	-	-	-
14	28	4.0	3.9	*	10	-	-	-	3.4	40	20	-	-	-
14	29	-	-	-	-	-	-	-	1	5	-	-	-	New Recruit
15	30	3.5	4.5	5	-	-	-	-	4.6	-	-	-	-	Recovered
15	31	1.5	2	-	-	-	-	-	2	-	-	-	-	-
15	32	3.0	2.8	*	-	-	-	-	2.6	-	-	-	-	-
16	33	5.0	0	100	-	-	-	Overturned	0	100	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
17	34	4.0	2.6	50*	-	-	-	-	0	100	-	-	-	-
17	35	2.0	2.2	50	-	-	-	-	0	100	-	-	-	-
17	36	1	0	100	-	-	-	-	0	100	-	-	-	-
18	37	2.5	4	20	-	-	-	-	0	100	-	-	-	-
19	38	2.5	3.4	*	-	-	-	-	3.6	-	-	-	-	-
20	39	2	2.6	*	-	-	-	-	2.4	40	-	-	-	-
21	40	3	2.9	*	20	-	-	-	0	100	-	-	-	-
22	41	2	3.5	*	-	-	-	-	0	100	-	-	-	-
22	42	1	2.5	*	-	-	-	-	2.7	5	30	-	-	-
23	43	1.5	2.7	-	-	-	-	-	3.5	-	-	-	-	-
23	44	-	2.1	-	10	-	-	-	3.1	40	-	-	-	-
23	45	-	0.9	-	-	-	-	-	1.3	-	-	-	-	-
23	46	2.5	4.6	-	-	-	-	-	4.8	-	-	-	-	-
24	47	4.5	5.4	*	-	-	-	-	2.1	20*	-	-	-	-
24	48	1.5	1.5	*	-	-	-	-	3	20	10	-	-	-
24	49	-	0	100	-	-	-	-	0	100	-	-	-	-
25	50	6	0	100	-	-	-	Overturned	0	100	-	-	-	-
25	51	2	0	100	-	-	-	Overturned	0	100	-	-	-	-
26	52	4	8.2	-	-	-	-	-	8.2	-	5	-	-	-
26	53	1.5	0	100	-	-	-	-	0	100	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
27	54	5.5	5.4	-	20	-	-	-	6.2	-	-	-	-	Recovered
27	55	-	3.8	*	-	-	-	-	3.8	-	10	-	-	-
27	56	-	2.3	10	-	-	-	-	1.6	10	-	-	-	-
27	57	-	3.7	-	-	-	-	-	2.7	*	-	-	-	-
27	58	-	2.9	10	-	-	-	-	2.5	-	5	-	-	-
28	59	7	0	100	-	-	-	-	4.8	10	-	-	-	Recovered from totally mortality
29	60	2.5	3	40	-	-	-	-	2.9	40	-	-	-	-
30	61	9.5	6.3	20*	-	-	-	-	4.9	-	-	-	-	-
30	62	-	0.7	10	-	-	-	-	0	100	-	-	-	-
30	63	-	1.3	5	-	-	-	-	2.1	-	-	-	-	Recovered
31	64	6	5.5	40	-	-	-	-	2.3	90	-	-	-	-
31	65	5	5.2	70	-	-	-	-	5.2	90	-	-	-	-
31	66	3.5	2.7	90	-	-	-	-	1.2	60	-	-	-	-
31	67	-	1.3	-	-	-	-	-	0.5	*	-	-	-	-
31	68	-	1.3	-	-	-	-	-	0	100	-	-	-	-
31	69	-	-	-	-	-	-	-	0.5	-	-	-	-	New Recruit
32	70	2.5	2.3	-	-	-	-	-	2.2	-	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
33	71	3	1.2	90	-	-	-	-	1.7	30	10	-	-	Partially Recovered
34	72	5	4.8	20	20	-	-	-	4.8	50	-	-	-	-
35	73	3	2.7	60	-	-	-	-	0	100	-	-	-	-
36	74	2.5	0	100	-	-	-	Overturned	0	100	-	-	-	-
36	75	1	1.9	20	-	-	-	Overgrown by bivalves	2.1	-	-	-	-	Recovered
37	76	1.5	0	100	-	-	-	-	0	100	-	-	-	-
37	77	3	2	90	-	-	-	-	0	100	-	-	-	-
38	78	2.5	1.5	*	-	-	-	-	2.2	-	-	-	-	-
38	79	-	1.4	-	-	-	-	-	0	100	-	-	-	-
38	80	-	1.2	-	-	-	-	-	1.9	-	-	-	-	-
39	81	3	2.1	*	-	-	-	-	4.7	*	-	-	-	-
40	82	1.5	4.9	30	40	-	-	-	5.8	-	-	-	-	Recovered
40	83	4	3.7	-	10	-	-	-	3.7	30	-	-	-	-
40	84	1	0	100	-	-	-	-	0	100	-	-	-	-
41	85	4	2.7	55*	-	-	-	-	3.8	5	-	-	-	Partially Recovered
41	86	1.5	1.9	80	-	-	-	-	0	100	-	-	-	-
42	87	2.5	3.2	-	-	-	-	-	0	100	-	-	-	-
42	88	5.5	3	*	-	-	-	-	0	100	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
42	89	-	1.9	-	-	-	-	-	0	100	-	-	-	-
43	90	3	0	100	-	-	-	Overturned	0	100	-	-	-	-
43	91	2	0	100	-	-	-	Overturned	0	100	-	-	-	-
44	92	6	7.8	-	-	-	-	-	8.2	10	-	-	-	-
44	93	7.5	0	100	-	-	-	-	1.4	-	-	-	-	Recovered from totally mortality
45	94	2	0	100	-	-	-	-	0	100	-	-	-	-
45	95	1	2.3	5	-	-	-	-	0	100	-	-	-	-
45	96	3.5	3	*	-	-	-	-	3.4	-	-	-	-	-
45	97	3.5	4.5	-	-	-	-	-	4.3	-	-	-	-	-
46	98	5	4.5	60	-	-	-	-	4.3	-	-	-	-	Recovered
46	99	3	0	100	-	-	-	-	3	80	-	-	-	Recovered from totally mortality
47	100	10	8.2	55	10	-	-	-	9.8	30	-	-	-	Partially Recovered
48	101	4	3.1	*	10	-	-	-	2.6	-	-	-	-	-
48	102	1.5	2	-	-	-	-	-	1.1	-	5	-	-	-
48	103	2.5	3.7	-	20	-	-	-	3.6	-	15	-	-	-
48	104		3.1	-	-	-	-	-	3.2	-	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
49	105	4	4.3	20	5	-	-	-	4.8	-	20	-	-	Partially Recovered
50	106	4	2.8	-	10	-	-	-	4	-	-	-	-	-
51	107	3	2.3	10	-	-	-	-	3	-	-	-	-	Recovered
52	108	13	12.7	10	-	-	-	-	12.7	-	10	-	-	-
52	109	3	0	100	-	-	-	-	0	100	-	-	-	-
52	110	-	0	100	-	-	-	-	0	100	-	-	-	-
52	111	-	0	100	-	-	-	-	0	100	-	-	-	-
52	112	-	3.7	40	10	-	-	-	3.7	-	-	-	-	Recovered
53	113	6	6.2	40	30	-	-	-	4.7	-	60	-	-	-
53	114	-	0	100	-	-	-	-	0	100	-	-	-	-
53	115	-	-	-	-	-	-	-	0.7	-	-	-	-	New recruit
54	116	4	4.5	70	-	-	-	Overturned	4.5	20	-	-	-	Partially Recovered
54	117	3	2.4	40	-	-	-	Overturned	2.1	-	40	-	-	-
54	118	1.5	0	100	-	-	-	Overturned	0	100	-	-	-	-
54	119	1.5	0	100	-	-	-	Overturned	0	100	-	-	-	-
54	120	-	0	100	-	-	-	Overturned	0	100	-	-	-	-
54	121	-	0	100	-	-	-	Overturned	0	100	-	-	-	-
54	122	-	0	100	-	-	-	Overturned	0	100	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
55	123	3.5	2.9	80	-	-	-	-	3	-	20	-	-	Partially Recovered
56	124	6.5	2.1	90	-	-	-	-	1.2	10	-	-	-	-
56	125	6	0.8	-	20	-	-	-	0.9	-	10	-	-	Partially Recovered
57	126	3	3.7	-	-	-	-	-	2.8	*	-	-	-	-
57	127	-	-	-	-	-	-	-	2	-	-	-	-	New Recruit
58	128	12.5	9.1	35	15	-	-	-	9.5	10	-	-	-	Partially Recovered
58	129	-	1.1	-	-	-	-	-	1.1	-	-	-	-	-
58	130	-	-	-	-	-	-	-	0.5	-	-	-	-	New Recruit
59	131	5	5.2	5	10	-	-	-	4.4	-	5	-	-	-
59	132	3	2.8	*	10	-	-	-	0	100	-	-	-	-
60	133	2.5	2.8	*	15	-	-	-	0	100	-	-	-	-
61	134	5	5.2	*	-	-	-	-	3.9	*	-	-	-	-
61	135	3	1.3	*	-	-	-	-	1.8	-	-	-	-	-
62	136	7.5	2.2	*	-	-	-	-	3.2	30	30	-	-	-
62	137	5	0	100	-	-	-	-	4	10	-	-	-	Recovered from totally mortality

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
63	138	6	6.1	60	-	-	-	-	7.1	40	-	-	-	Partially Recovered
63	139	-	0	100	-	-	-	-	0	100	-	-	-	-
63	140	2	2.4	10	-	-	-	-	2.8	-	-	-	-	-
63	141	-	-	-	-	-	-	-	0.5	-	-	-	-	New Recruit
64	142	3	3.1	80	-	-	-	-	3	10	20	-	-	Partially Recovered
64	143	2.5	0	100	-	-	-	-	0	100	-	-	-	-
65	144	6.5	3	90	-	-	-	-	3.8		-	-	-	Recovered
66	145	4.5	0	100	-	-	-	Overturned	0	100	-	-	-	-
66	146	1.5	2.4	95	-	-	-	Overturned	3.6	30	-	-	-	-
66	147	1	0	100	-	-	-	Overturned	0	100	-	-	-	-
66	148	-	1.2	50	-	-	-	Overturned	3.4	25	-	-	-	-
66	149	2	0	100	-	-	-	Overturned	0	100	-	-	-	-
67	150	3.5	4.6	20	30	-	-	-	3.5	-	30	-	-	-
67	151	1	0	100	-	-	-	-	0	100	-	-	-	-
67	152	1	0	100	-	-	-	-	0	100	-	-	-	-
67	153	3.5	1.9	40	-	-	-	-	1.6	-	-	-	-	-
67	154	4	3.6	80	-	-	-	-	3	-	-	-	-	-
68	155	8	8.6	90	-	-	-	-	2.4	40	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at 1st Post-Translocation (cm)	Health Status (September 2009)					Coral Diameter measured at 2nd Post-Translocation (cm)	Health Status (December 2009)				
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks		Partial /Total Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)	Remarks
69	156	2	1.9	60	-	-	-	-	1.7	10	-	-	-	-
69	157	3.5	3.6	30	10	-	-	-	3.5	-	5	-	-	-
70	158	4	5.2	20	-	-	-	-	5.5	-	-	-	-	Recovered
70	159	2	2.6	10	-	-	-	-	2.6	-	-	-	-	-
70	160	3	3.2	*	-	-	-	-	3.2	-	-	-	-	-
70	161	-	-	-	-	-	-	-	0.4	-	-	-	-	New Recruit
70	162	-	-	-	-	-	-	-	0.5			-	-	New Recruit
23B	163	-	2.9	20	-	-	-	-	2.1	-	5	-	-	-
23B	164	-	1.3	30	-	-	-	-	1.5	-	-	-	-	Recovered
23B	165	-	0	100	-	-	-	-	0	100	-	-	-	-
23B	166	-	5	70	-	-	-	-	3.4	-	5	-	-	-
40B	167	-	0	100	-	-	-	Overturned	0	100	-	-	-	-
40B	168	-	0	100	-	-	-	Overturned	0	100	-	-	-	-
40B	169	-	1.6	90	-	-	-	Overturned	1.4	-	-	-	-	Recovered
40B	170	-	0	100	-	-	-	Overturned	0	100	-	-	-	-

Notes: 1) 100 % Partial Mortality = whole coral colony died (total mortality).
2) * denotes a possible underestimate of % Partial Mortality. Percentage partial mortality of the coral colony was possibly underestimated as a portion of the coral skeleton was covered in sediment and/or overgrown by fouling organisms.

Coral permanently lost

Coral had died since the September 2009 survey

Table 7: Summary Table of the Results of the Reference *Oulastrea crispata* Assessment in December 2009

Running Count of *Oulastrea* Colonies	Coral Diameter (cm)	Coral Size (cm^2)	Health Status (December 2009)			
			Partial / Total Mortality (% Affected)	Sediment (% affected)	Blanched (% Affected)	Bleached (% Affected)
Inside Recipient Site						
1	0.8	0.3	-	5		
2	1.9	1.7	-	-		
3	1.1	0.7	-	-	-	-
4	1.7	1.5	10	5	-	-
5	2.8	2.6	-	50	-	-
6	1.2	0.9	-	10	-	-
7	2.2	3.1	20	5	-	-
8	2.2	2.0	-	5	-	-
9	1.1	0.7	-	10	-	-
10	1.4	1.0	-	10	-	-
11	1.7	1.0	30	-	-	-
12	1.6	1.3	-	5	-	-
13	1.0	0.6	10	5	-	-
14	1.8	1.7	-	20	-	-
15	1.4	1.2	-	5	-	-
16	1.6	1.2	-	-	-	-
17	2.7	4.1	-	5	-	-
18	1.1	1.1	-	-	-	-
19	1.3	0.7	-	10	-	-
20	2.2	2.5	-	-	-	-

Running Count of *Oulastrea* Colonies	Coral Diameter (cm)	Coral Size (cm^2)	Health Status (December 2009)			
			Partial / Total Mortality (% Affected)	Sediment (% affected)	Blanched (% Affected)	Bleached (% Affected)
Along Reference Transect						
1	2.3	2.7	-	10		
2	3.4	6.3	5	20		
3	1.2	0.8	-	-	-	-
4	1.0	0.6	-	-	-	-
5	1.4	1.2	-	-	-	-
6	1.5	1.4	-	-	-	-
7	1.9	2.1	-	-	-	-
8	1.5	1.4	-	5	-	-
9	1.8	2.3	-	5	-	-
10	2.4	2.2	-	10	-	-
11	1.4	1.4	-	40	-	-
12	2.4	3.4	-	-	-	-
13	1.2	0.7	-	-	-	-
14	1.6	1.4	-	-	-	-
15	1.1	0.8	-	-	-	-
16	1.3	1.1	-	5	-	-
17	1.5	1.0	-	5	-	-
18	2.0	2.4	-	-	-	-
19	1.7	1.7	-	-	-	-
20	2.2	2.6	-	-	-	-

Figures

Figure 1.1 Cruise Terminal Development Layout Plan

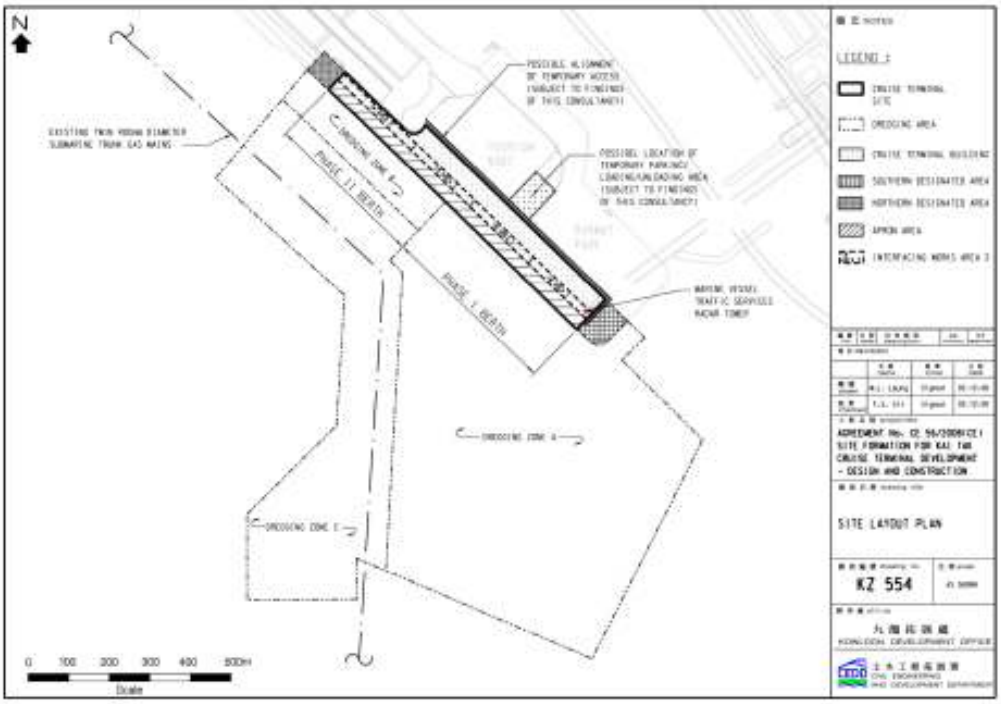


Figure 2.1 Location of the Approved Recipient Site at Tseung Kwan O

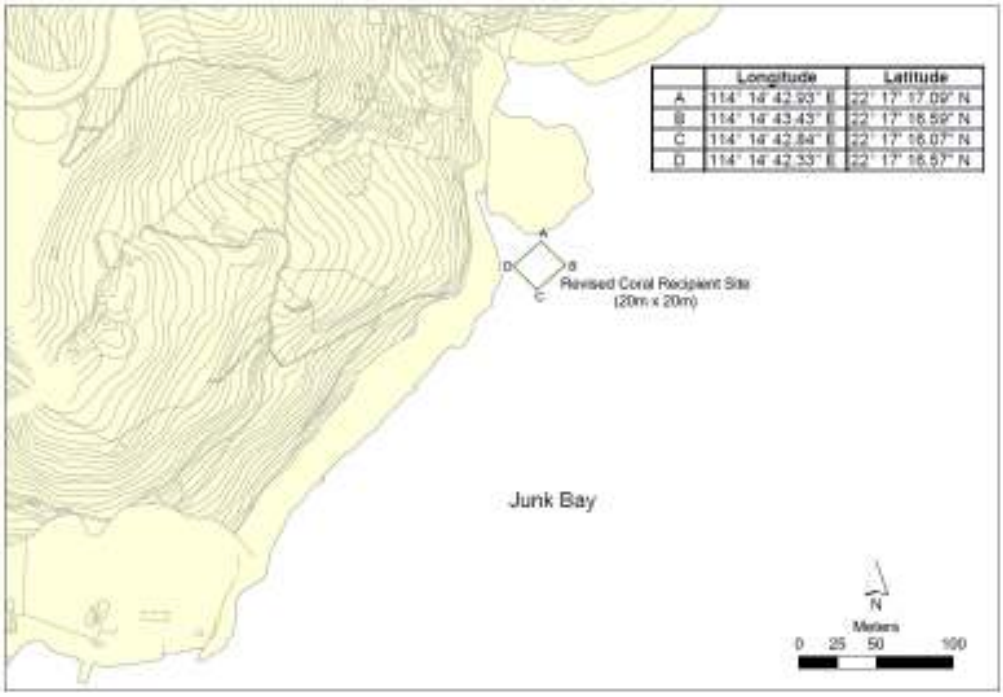


Figure 2.2 **Location Plan of Translocated Boulders/Rocks established during first and second post-translocation coral survey. O - indicates boulder/rock with tag number (as in *Table 5*) in September and December 2009.**

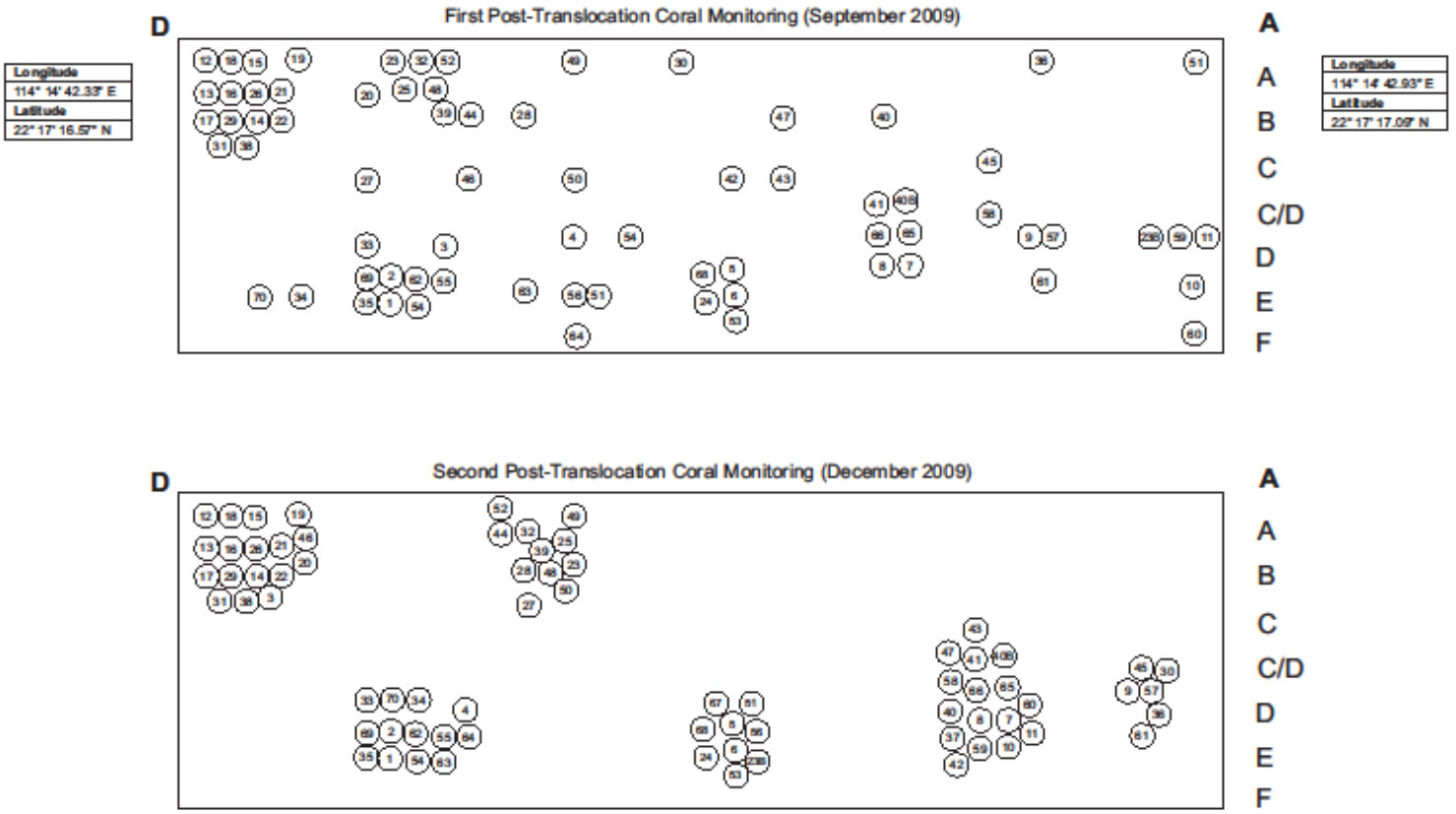


Figure 3.1 **Representative Photographs of some of the New *Oulastrea crispata* Coral Recruits (circled in red) Recorded From the Translocated Boulders/Rocks within the Recipient Site in December 2009.**

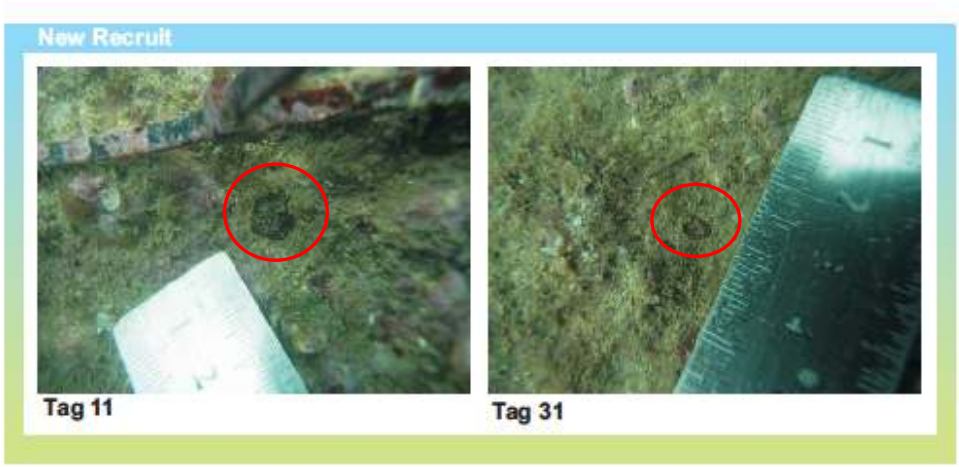


Figure 3.2 Representative Photographs of Selected *Oulastrea crispata* Colonies which exhibited Partial/ Totally Mortality (recorded in September 2009) undergoing Recovery Process in December 2009.

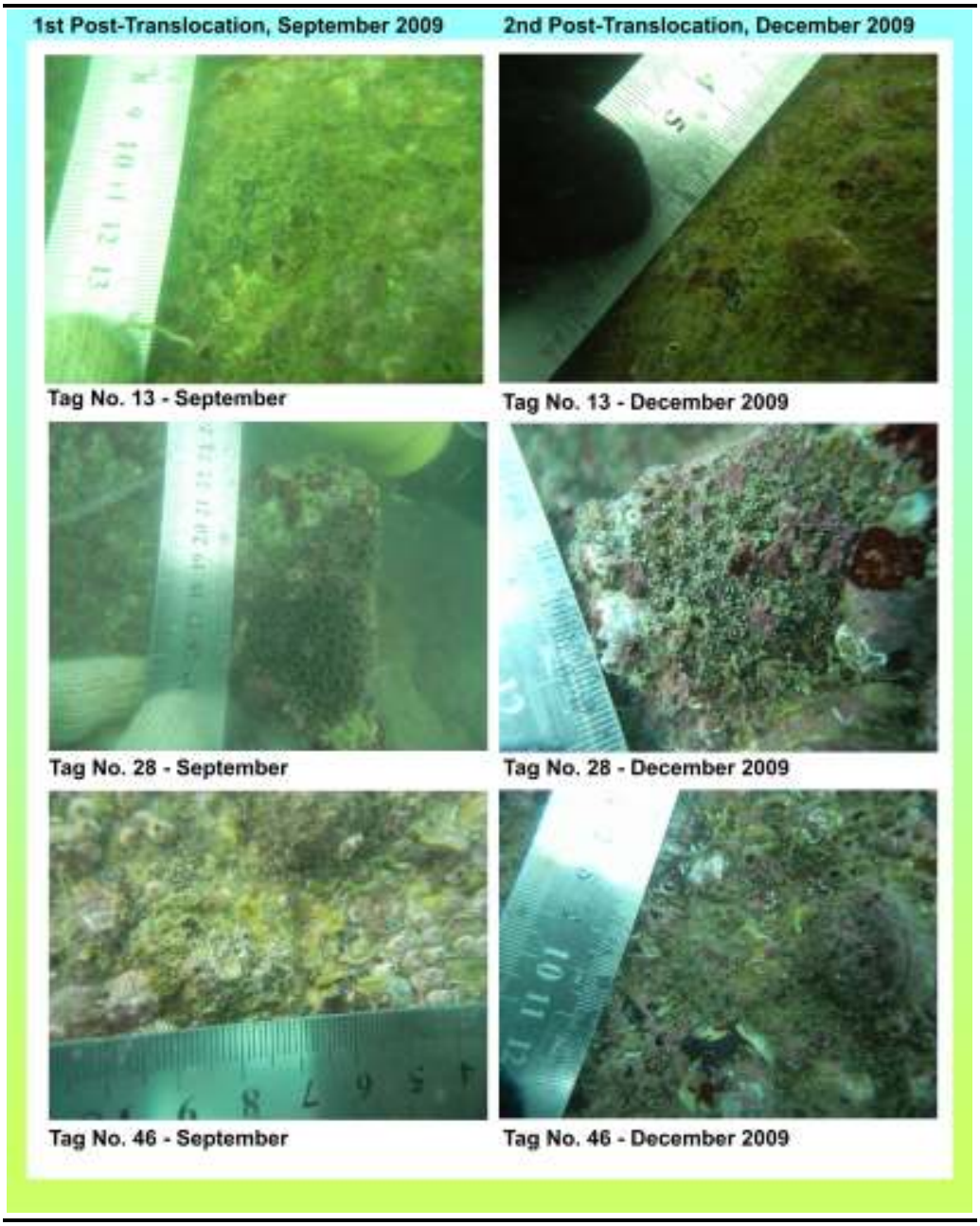


Figure 3.3 Representative Photographs of Selected *Oulastrea crispata* Colonies recorded during Baseline (June 2009), First (September 2009) and Second (December 2009) Post-translocation Coral Monitoring Survey.

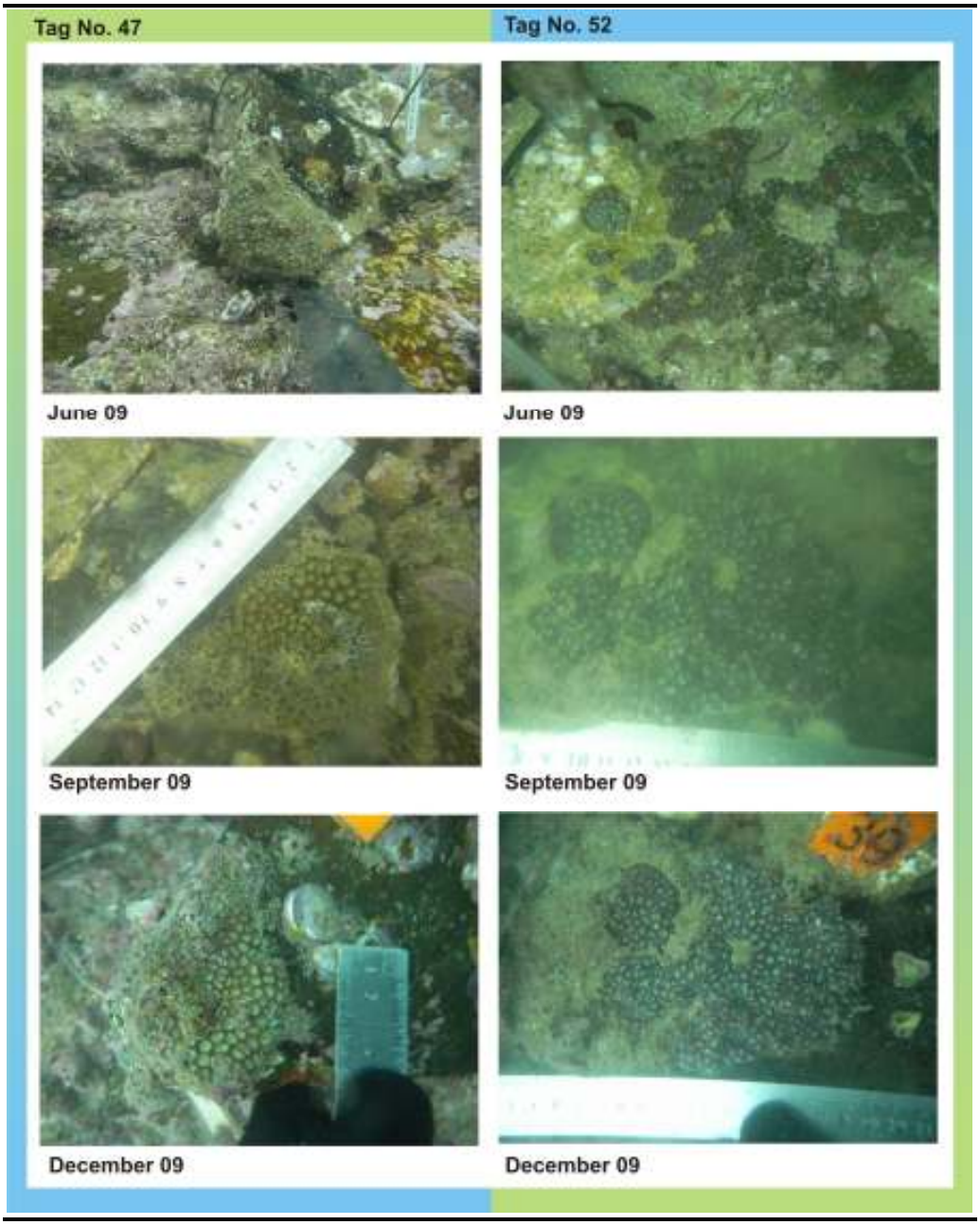
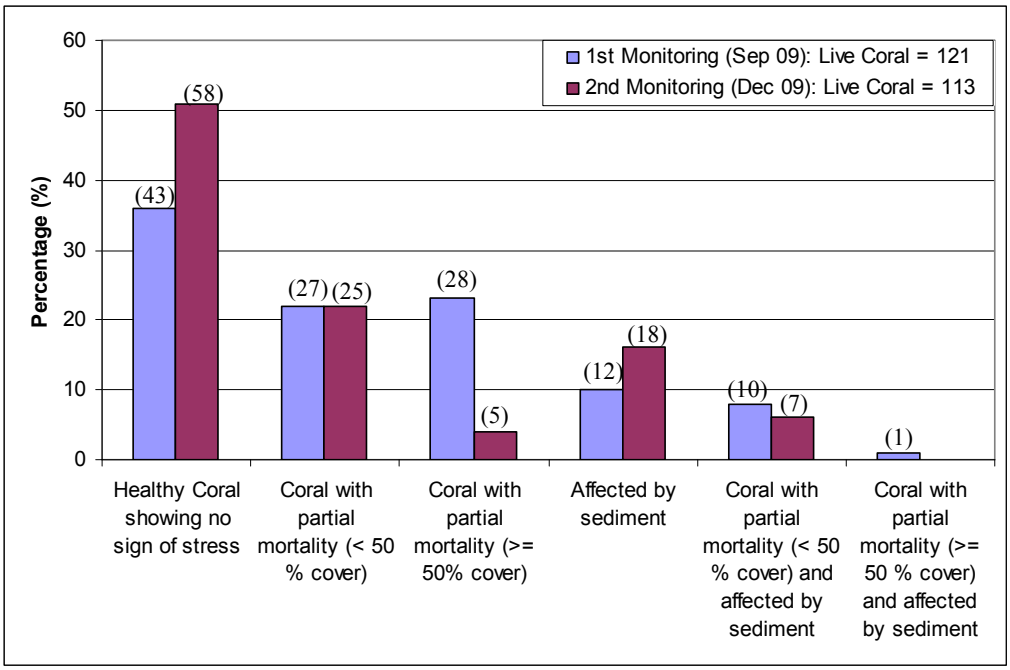


Figure 3.4 Status of Health Parameters for Translocated Coral Colonies at the Recipient Site in Tseung Kwan O (as recorded in September and December 2009)



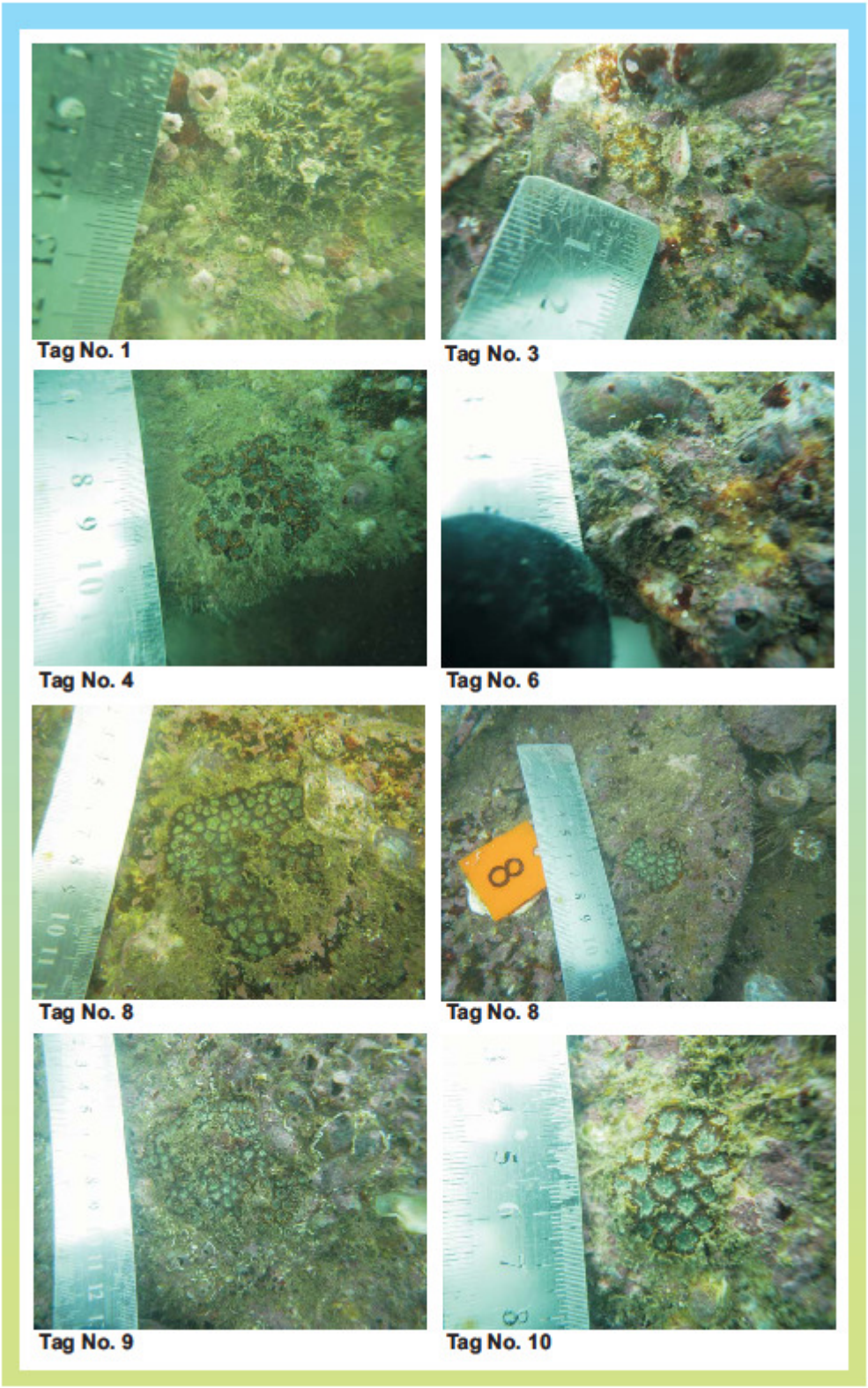
( ) Number of coral colonies recorded.

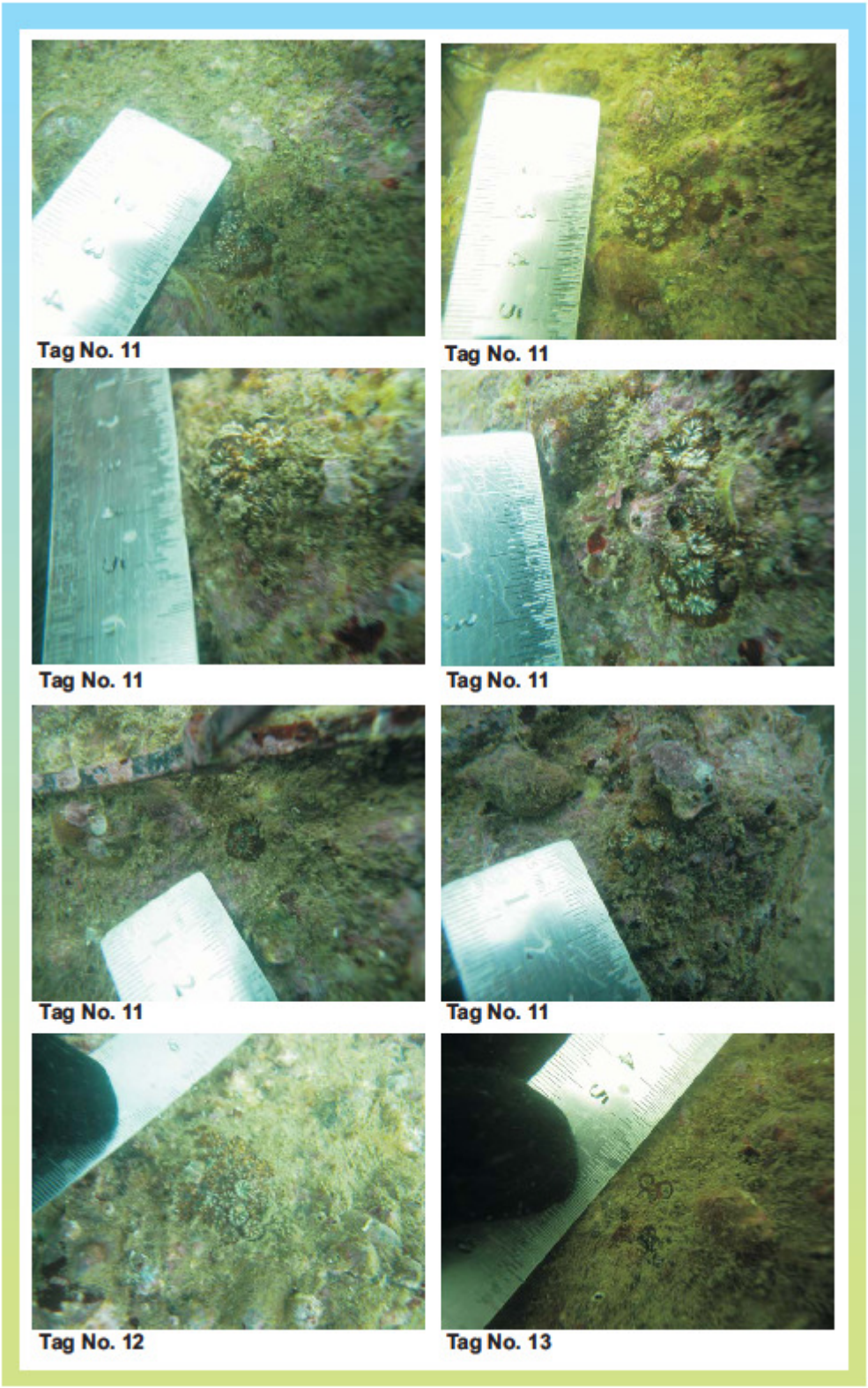
Annex A

Photographic Images Recorded for Each of the Translocated and Reference Coral Colonies Assessed During the Second Post-translocation Survey, December 2009

CONTENTS

A1 TRANSLOCATED CORAL COLONIES

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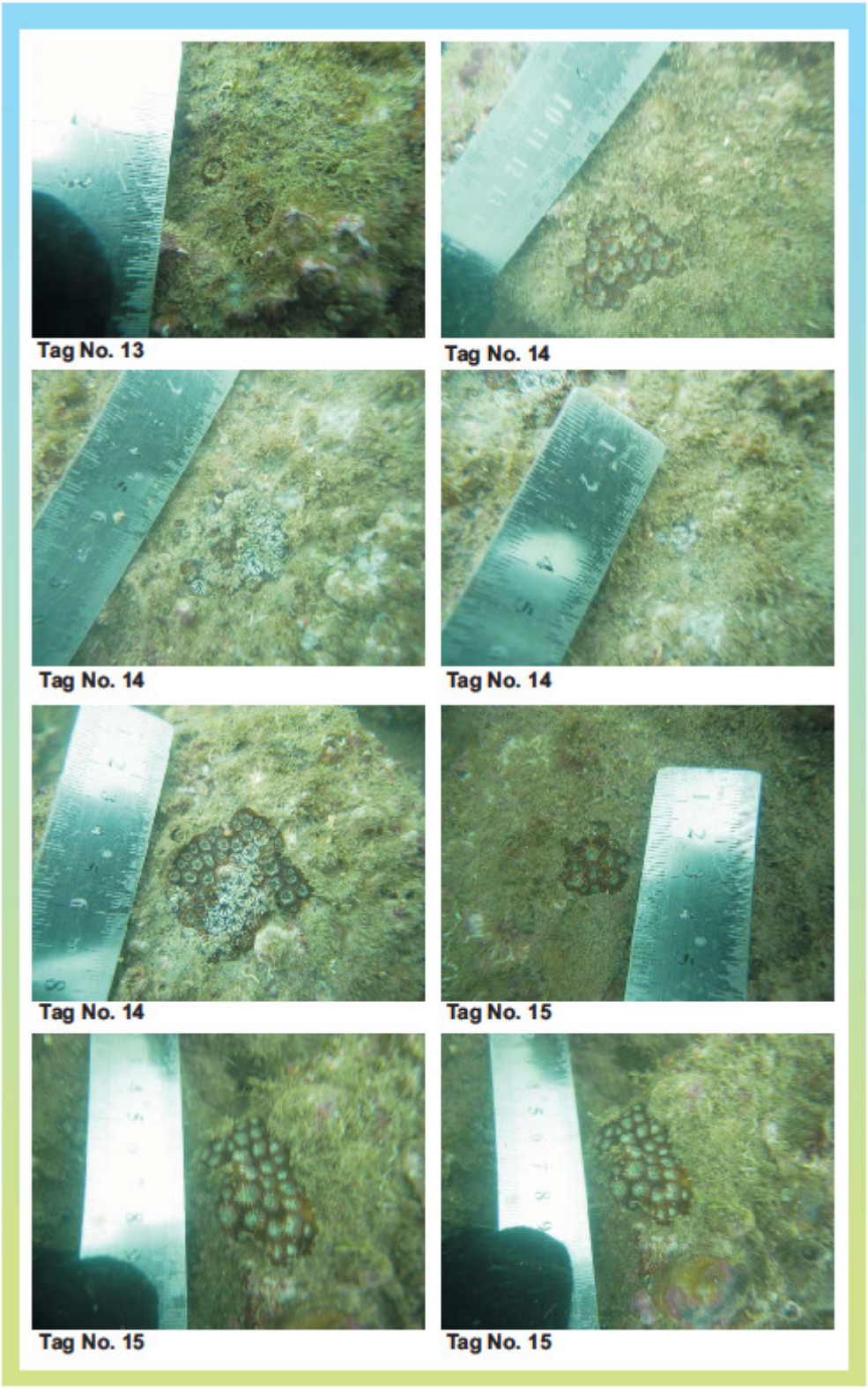
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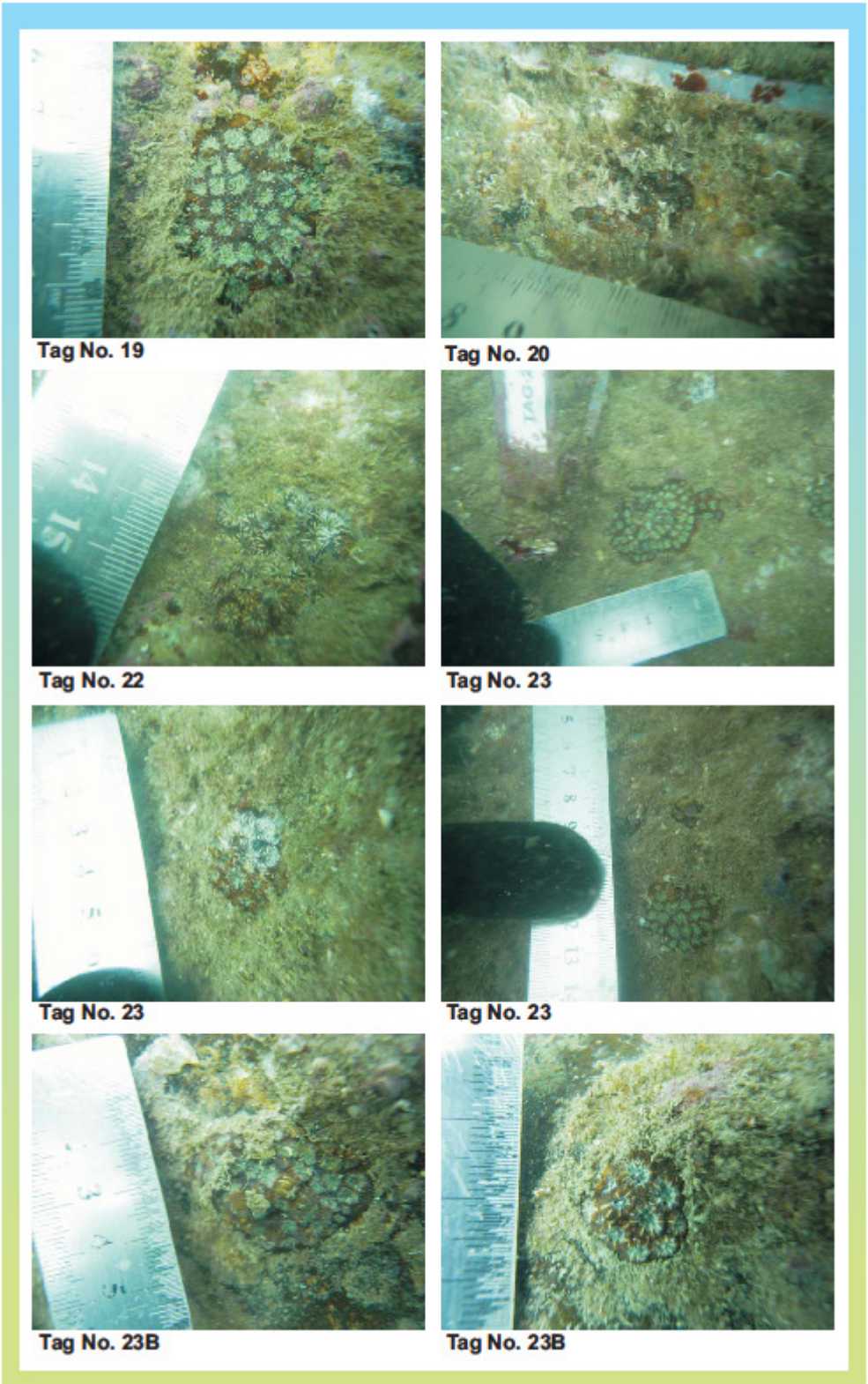
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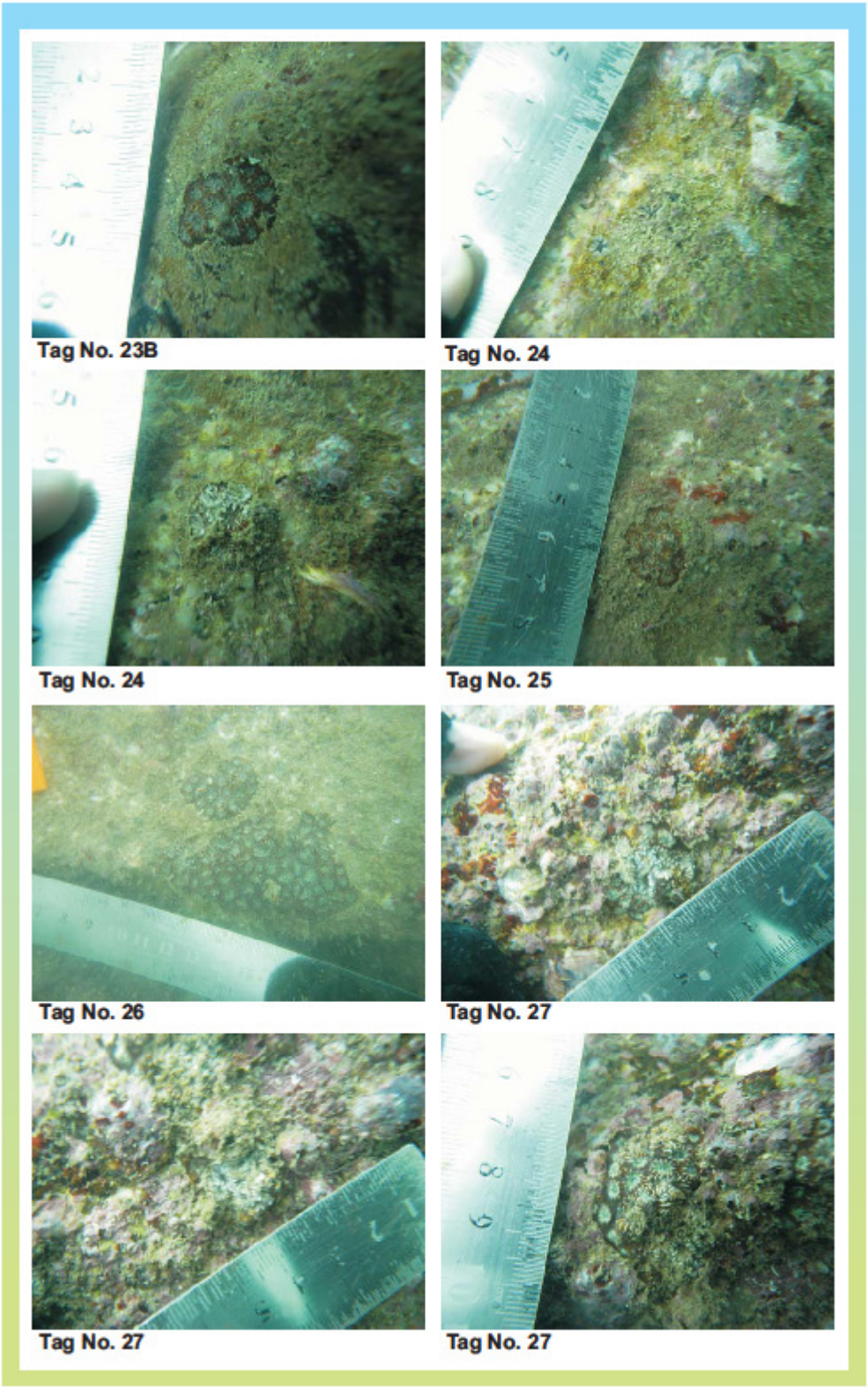
Tag No. 23B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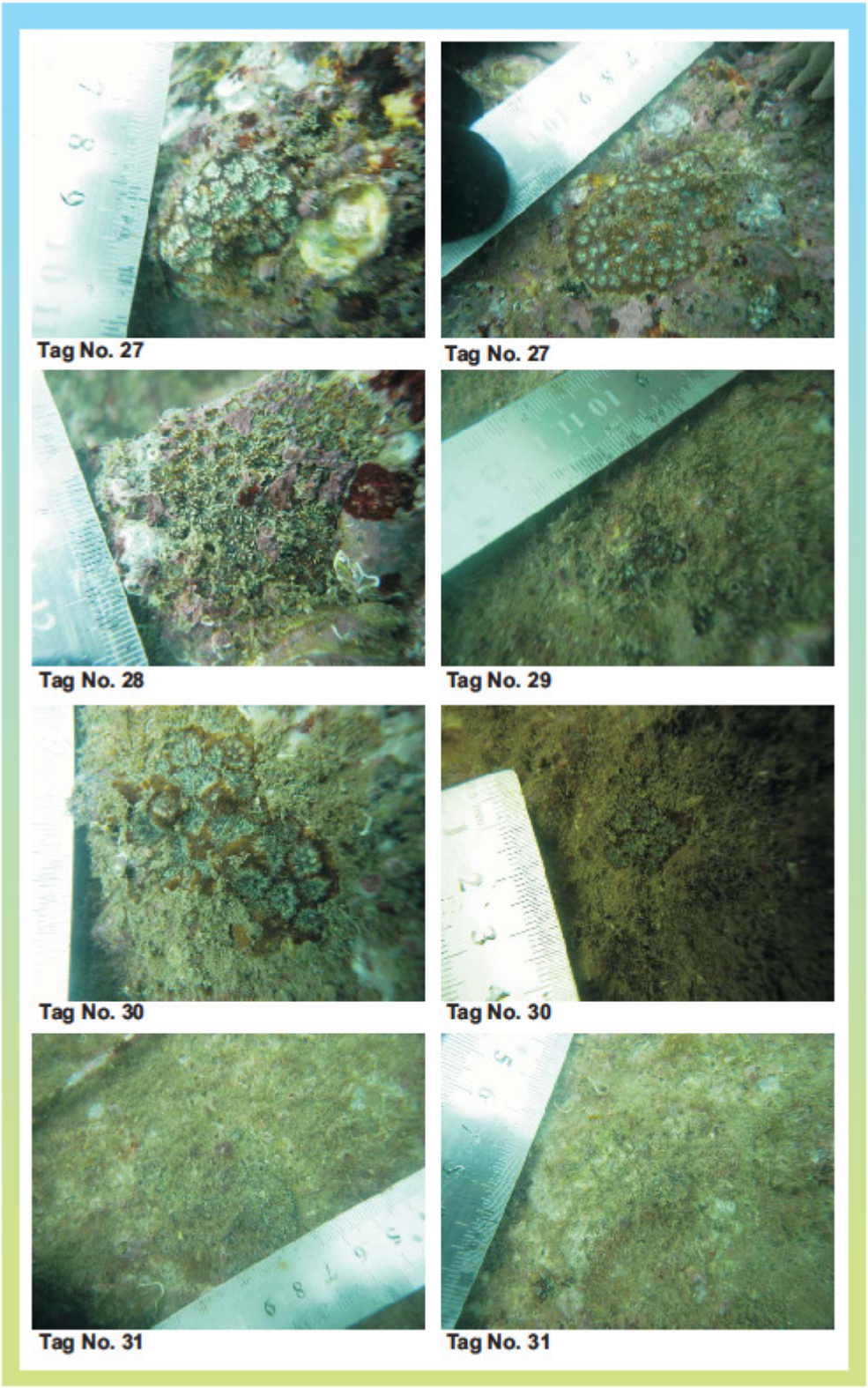
Tag No. 27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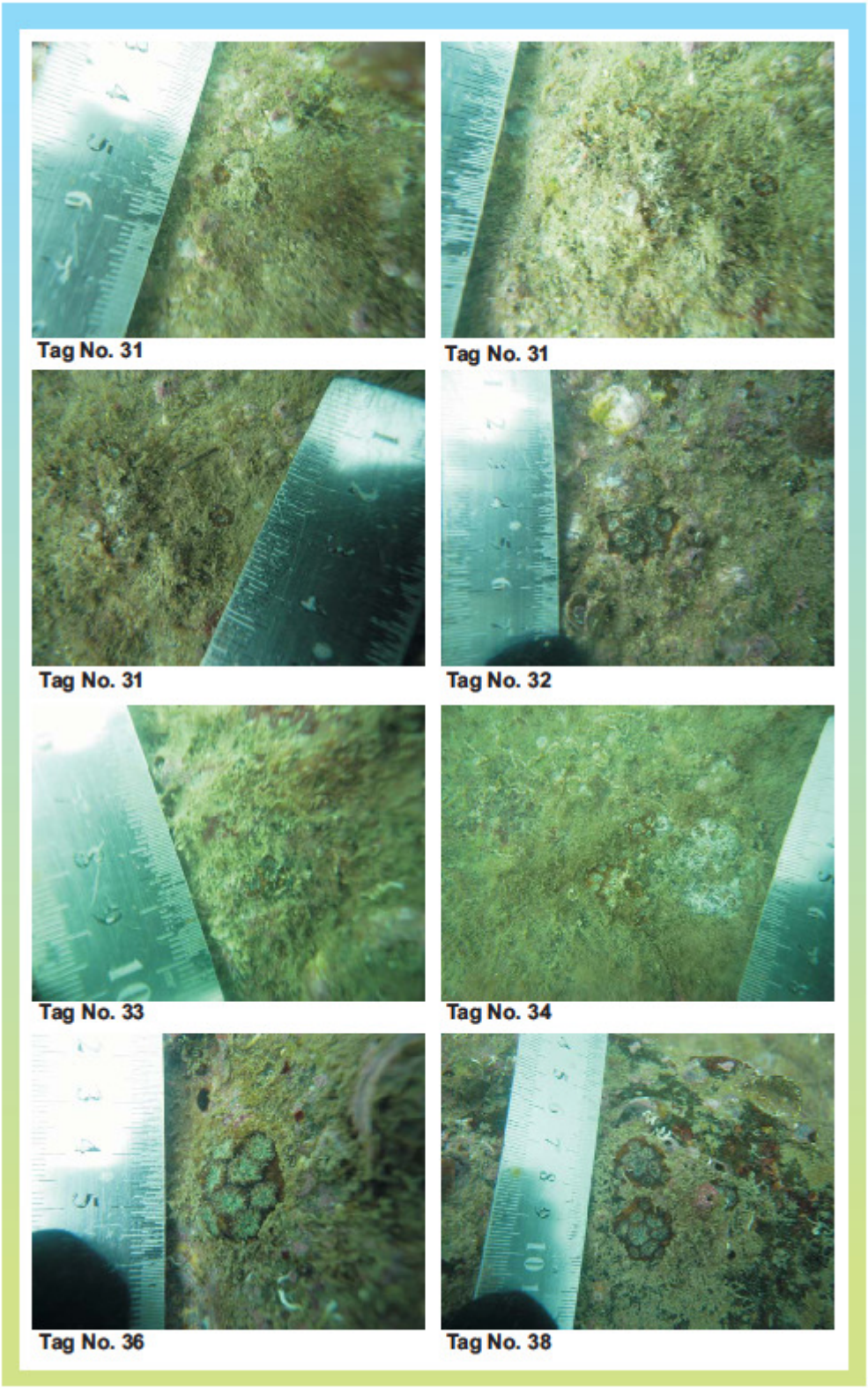
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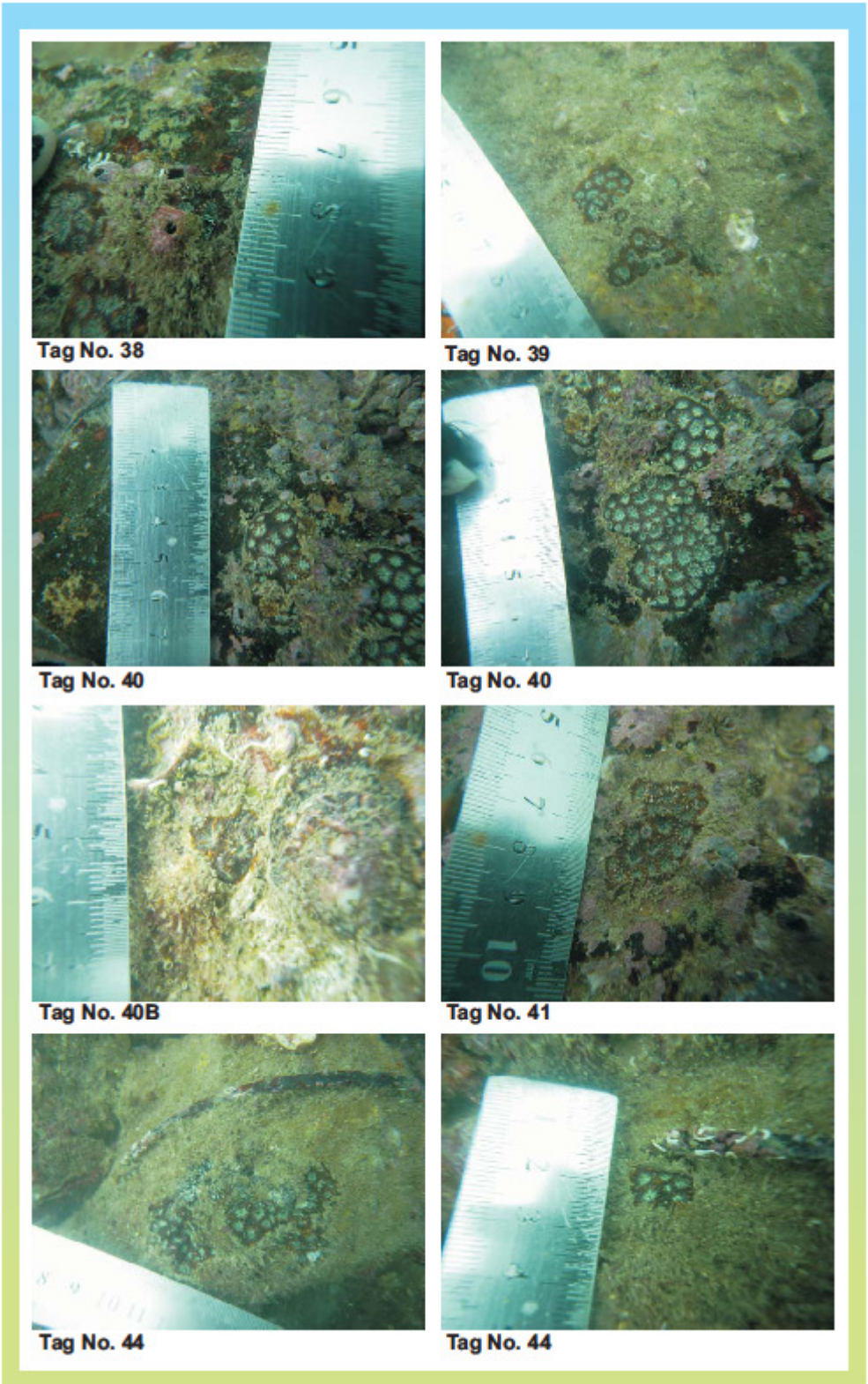
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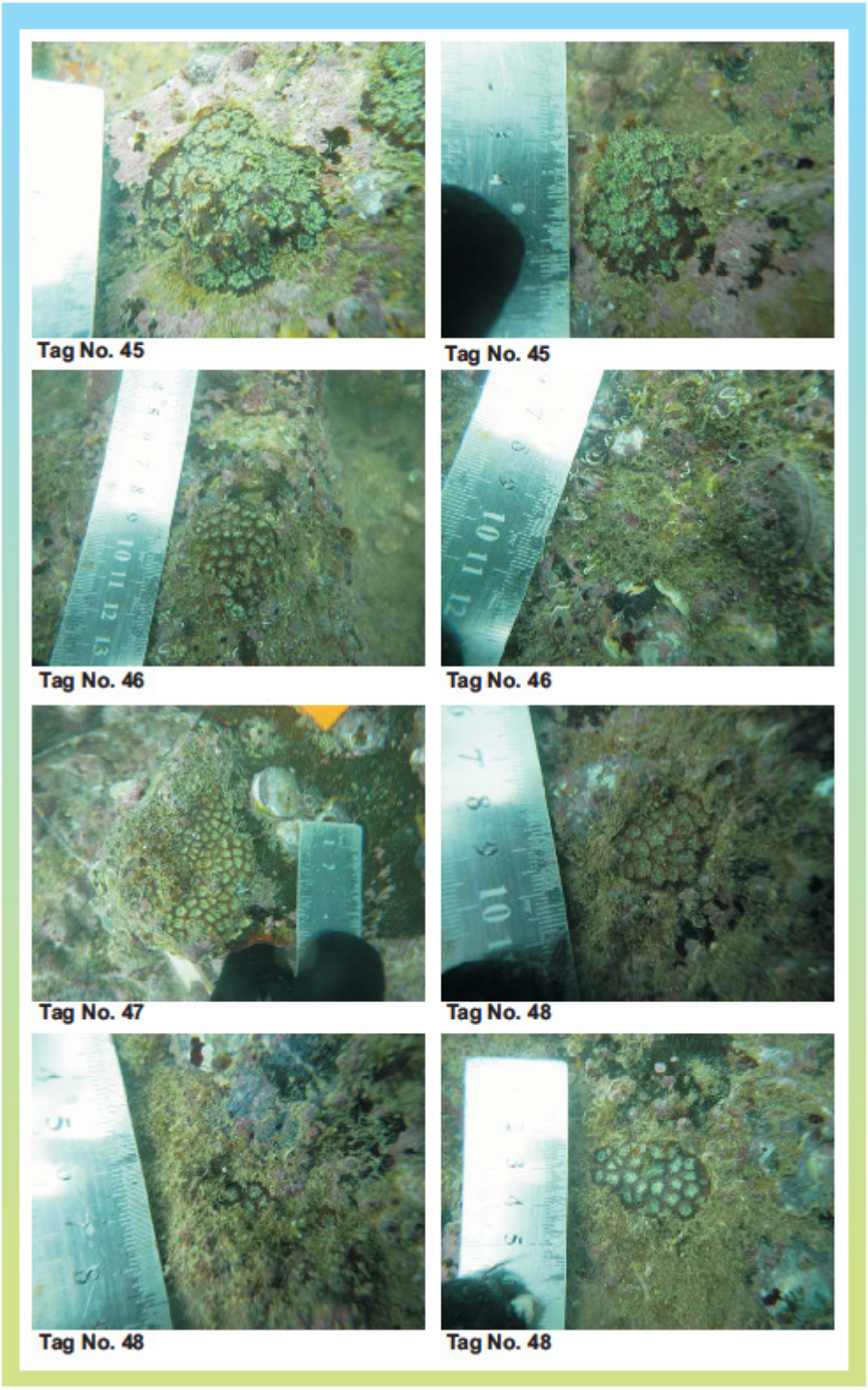
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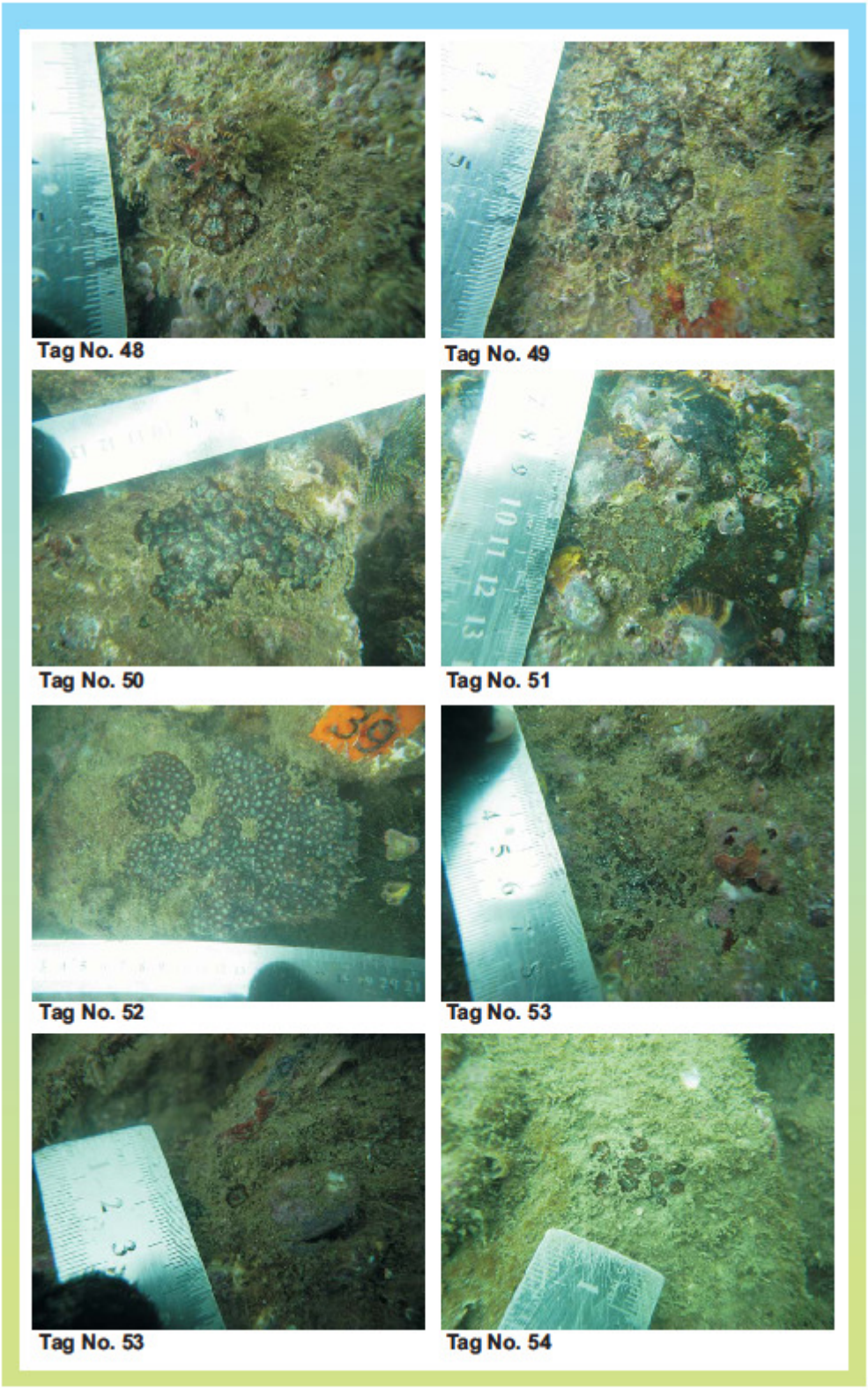
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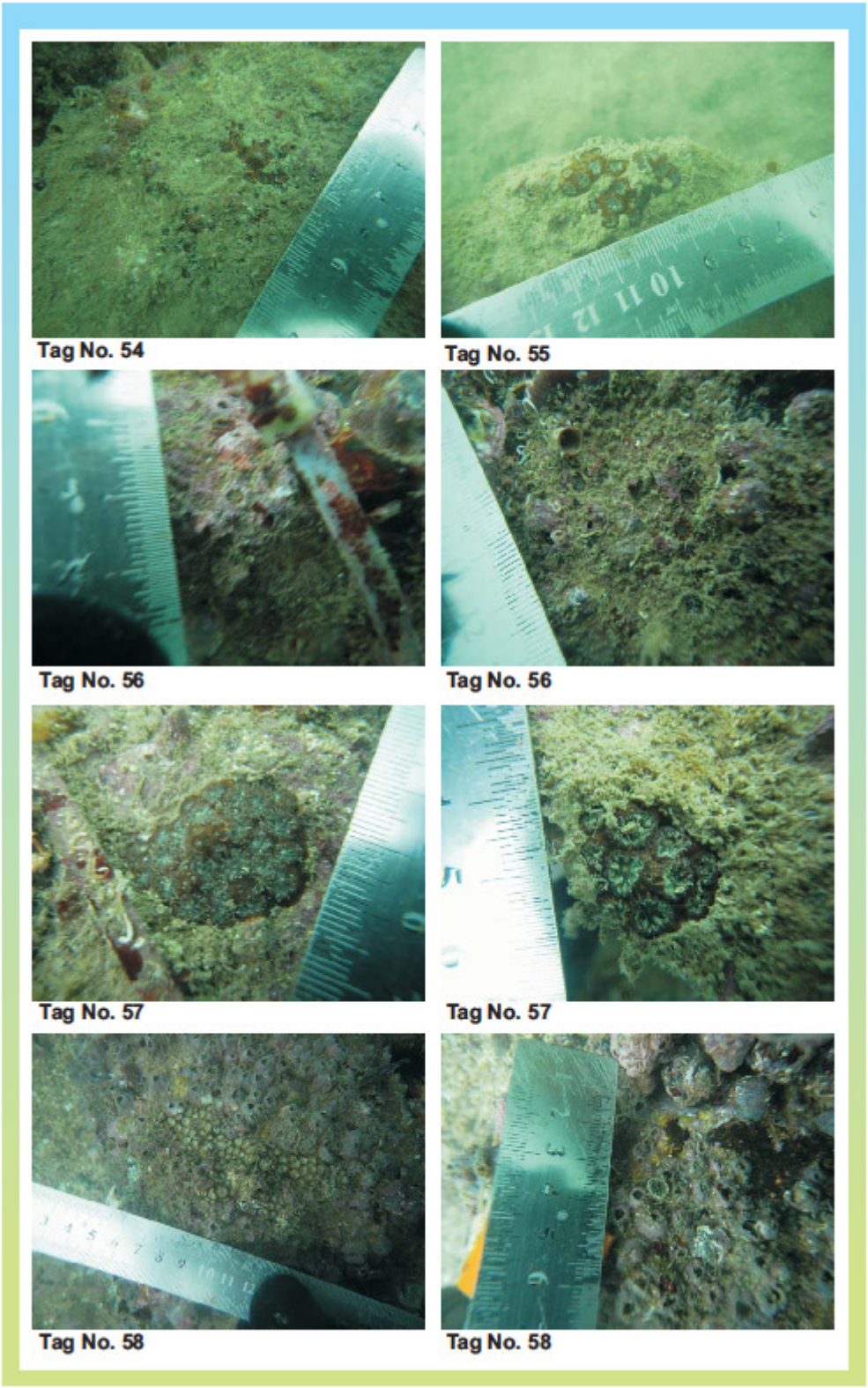
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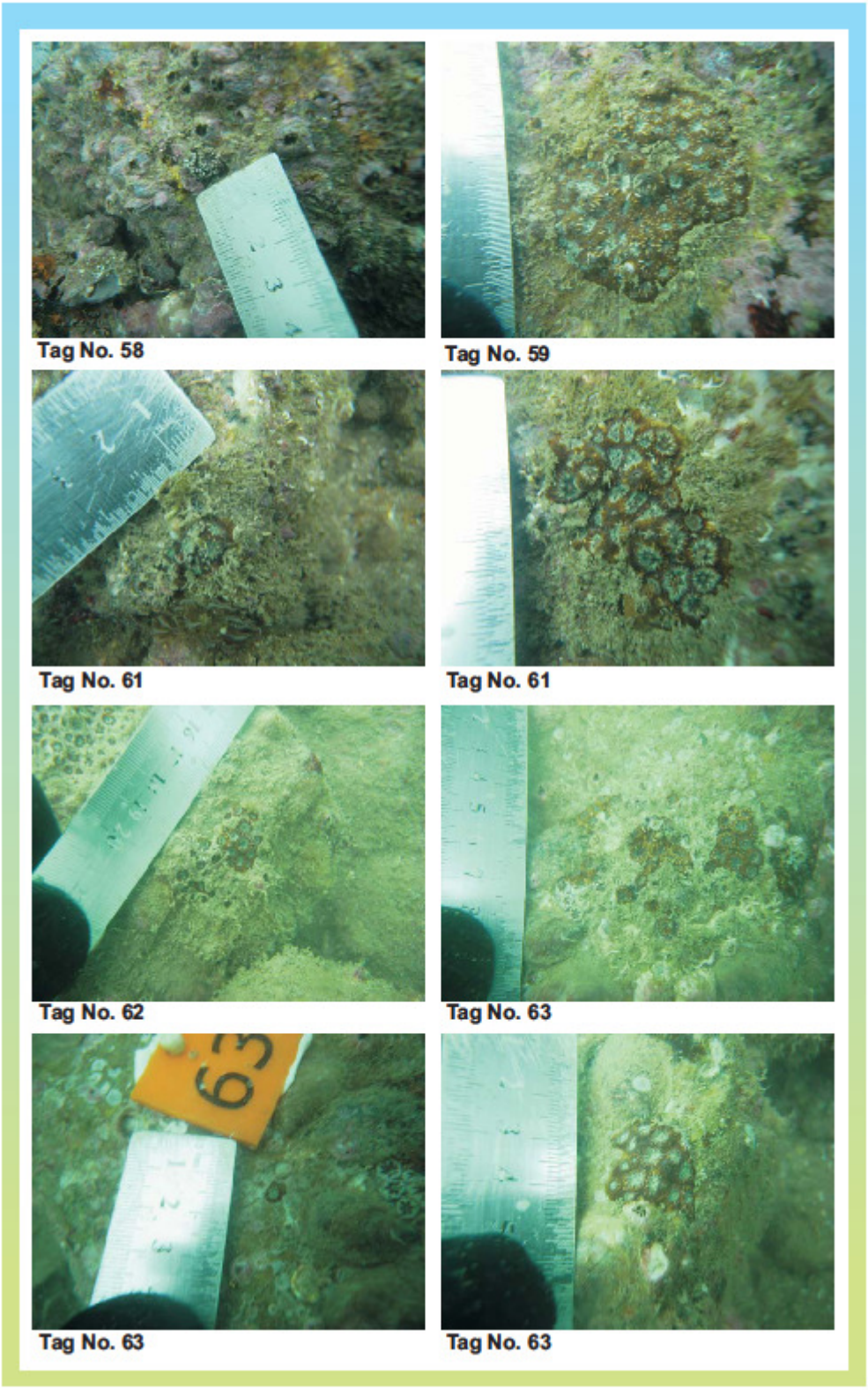
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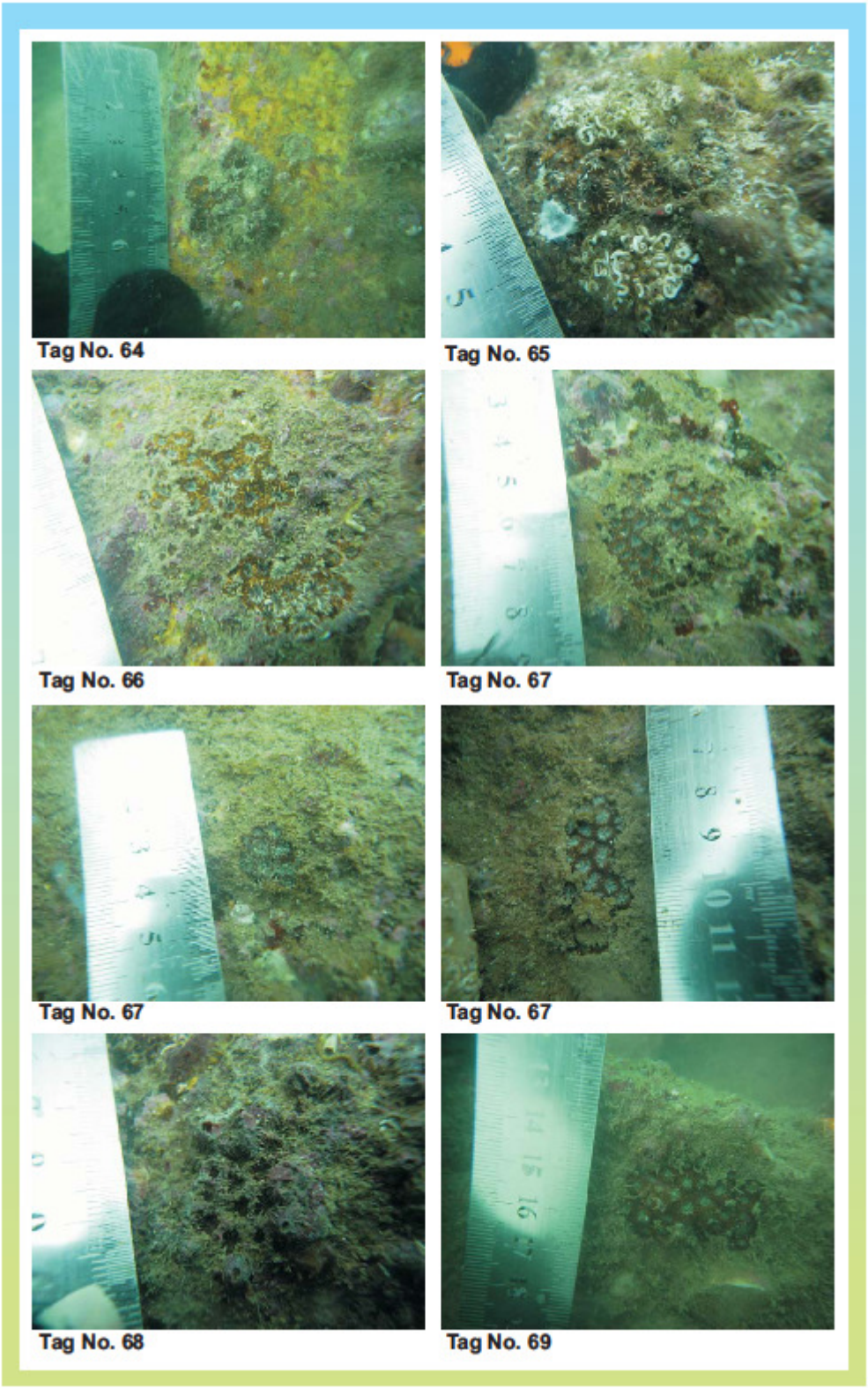
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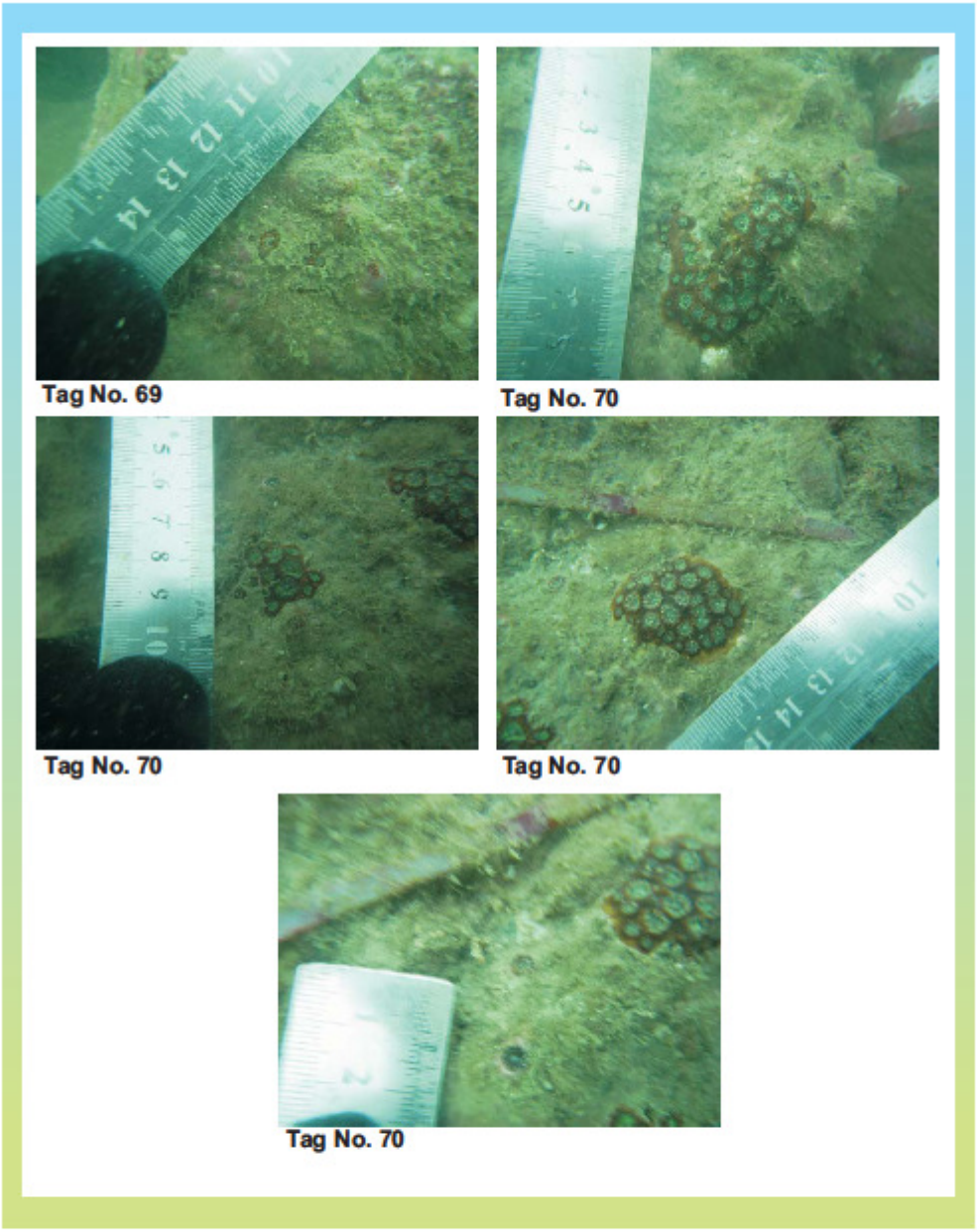
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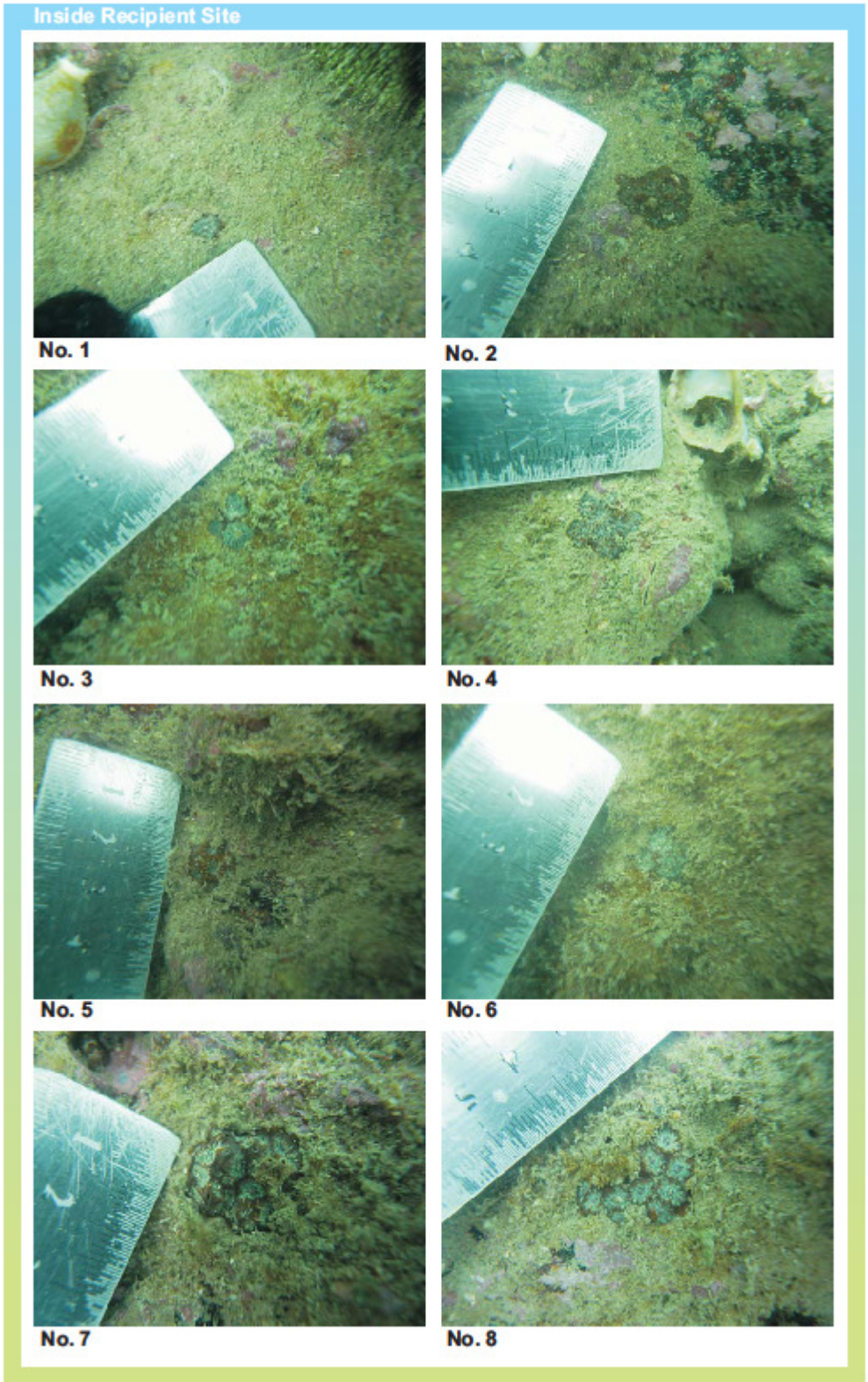
Tag No. 70

A2 REFERENCE CORAL COLONIES (INIDE RECIPIENT SITE)



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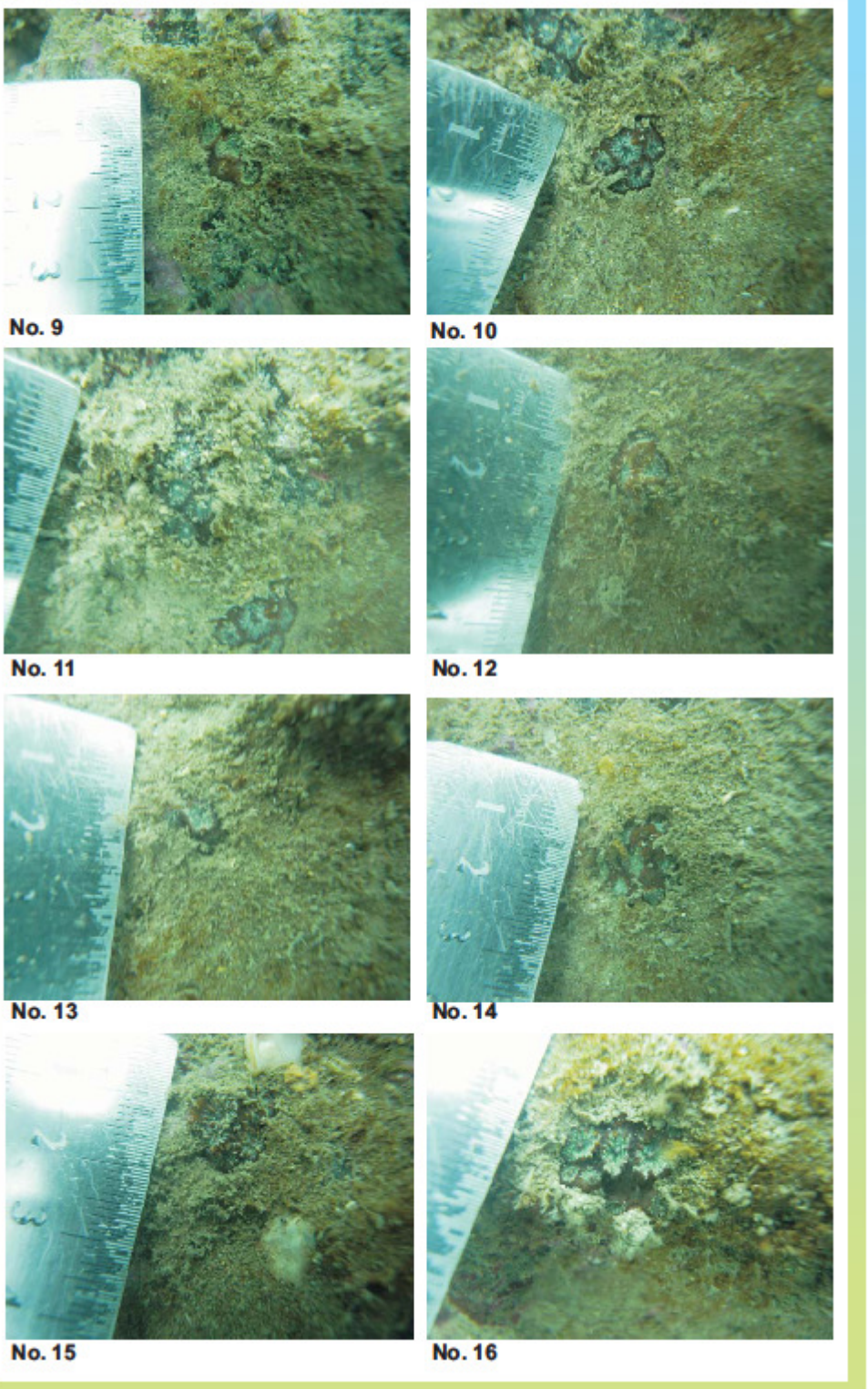

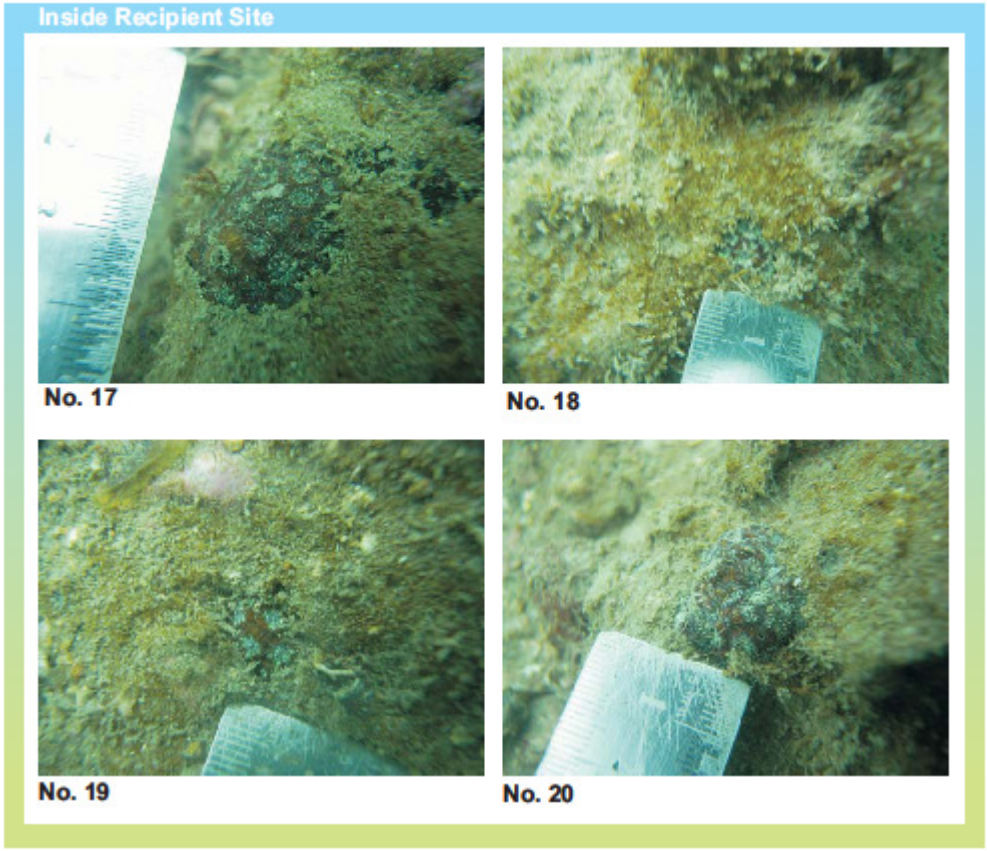
Inside Recipient Site
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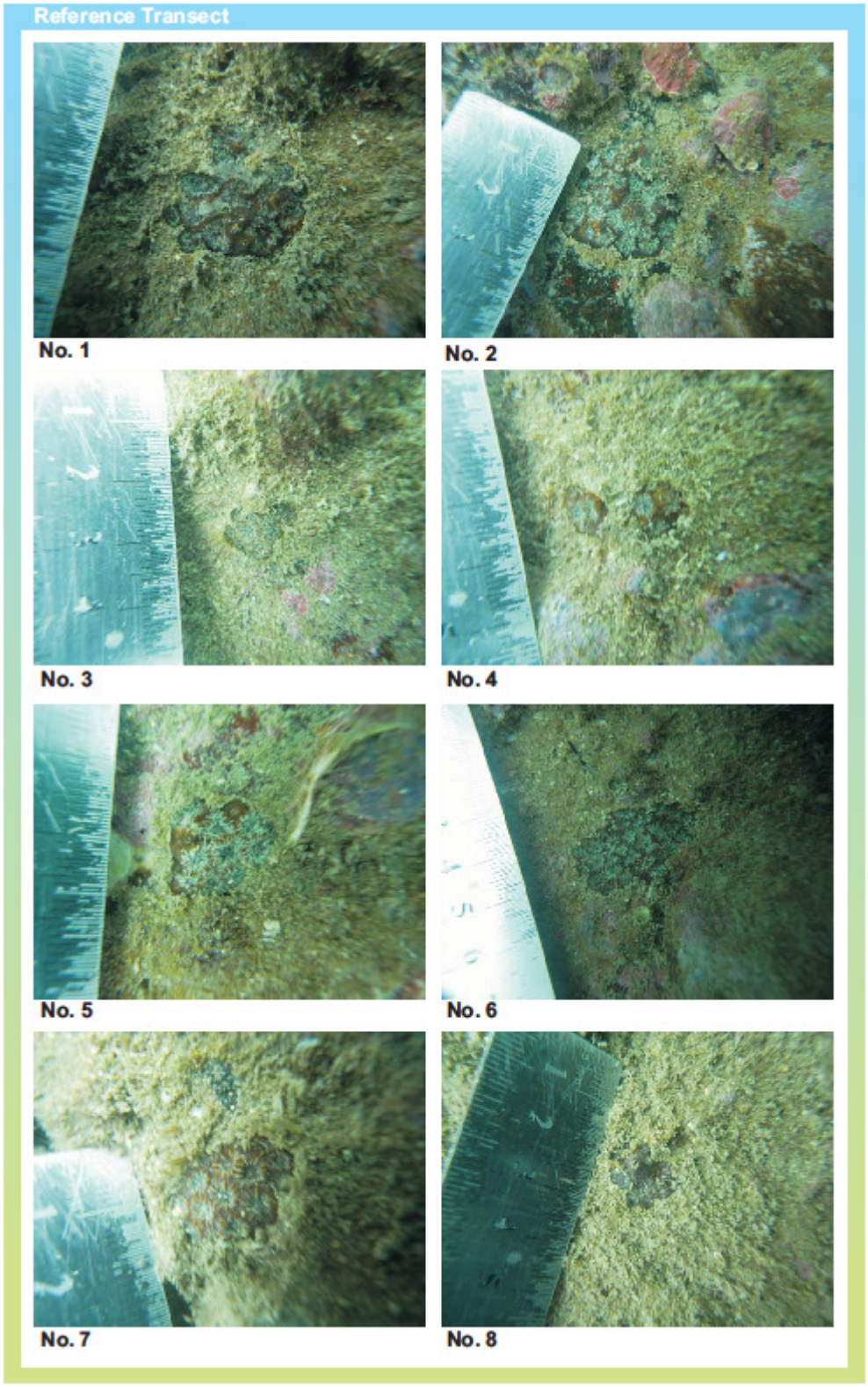
No. 18
No. 19
No. 20

A3 REFERENCE CORAL COLONIES (ALONG REFERENCE TRANSECT)



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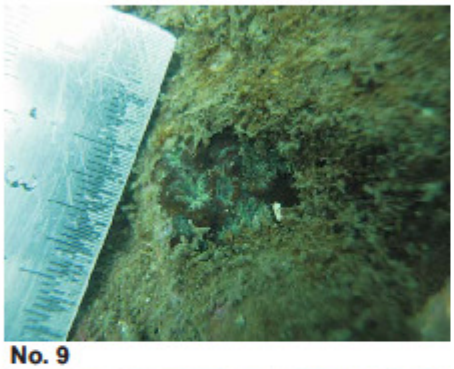
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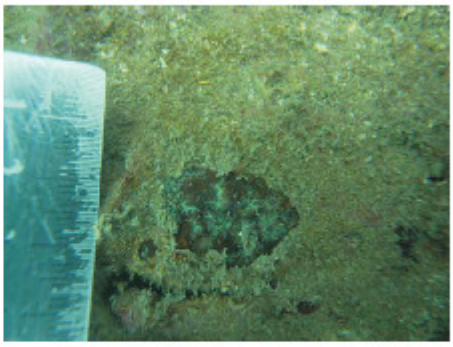
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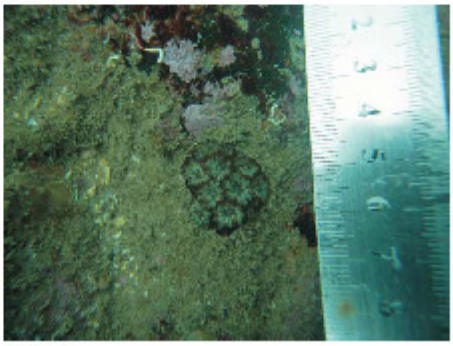
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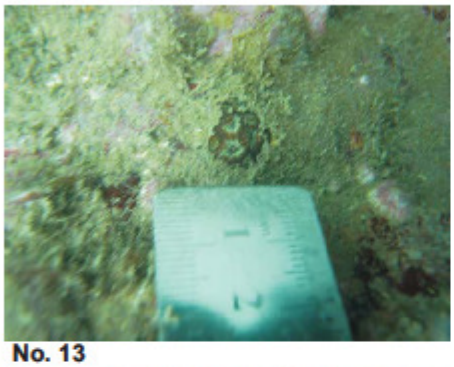
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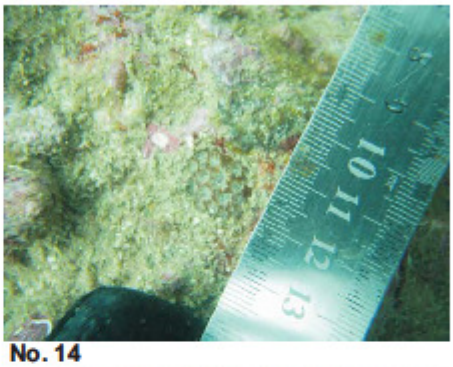
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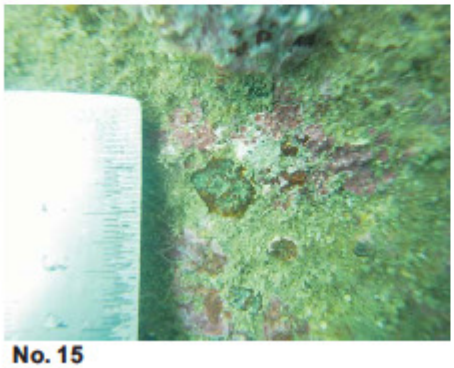
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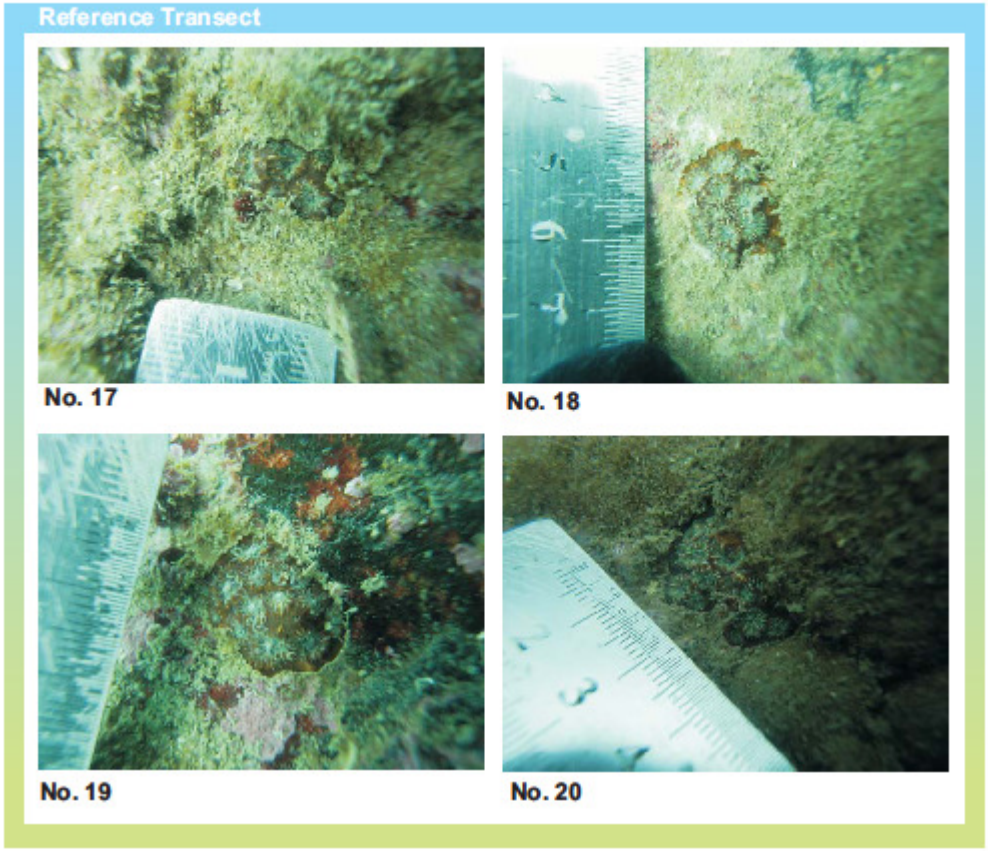
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No. 19
No. 20

Annex B

Summary Table of the *Oulastrea crispata* Colony Details for each tagged Boulder/Rock for the Baseline Post-translocation Survey, June 2009

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
1	1	7.5	5.7	-	-	-	-
2	2	1	1.3	-	-	-	-
3	3	2.5	3.3	-	-	-	-
3	4	-	1.2	-	-	-	-
3	5	-	2.2	-	-	-	-
4	6	4	5.3	-	-	-	-
5	7	5.5	6.2	-	5	-	-
5	8	-	5.4	-	-	-	-
6	9	-	2.2	-	-	-	-
6	10	2.5	4.1	-	-	-	-
7	11	6.5	8.6	-	5	-	-
8	12	2.5	7.8	-	-	-	-
8	13	1.5	2.1	-	-	-	-
9	14	7	9.4	-	-	-	-
9	15	4.5	4.1	-	-	-	-
10	16	2.5	4.6	-	-	-	-
11	17	-	1.4	-	-	-	-
11	18	3	3	-	-	-	-
11	19	-	0.6	-	-	-	-
11	20	-	0.5	-	-	-	-
11	21	-	0.8	-	-	-	-
11	22	-	-	-	-	-	-
12	23	4	5.5	-	5	-	-
13	24	4.5	6.1	<5 (sediment removal)	-	-	-
13	25	-	-	-	-	-	-
14	26	3.5	4.8	-	-	-	-
14	27	-	5.5	-	-	-	-
14	28	4	4.8	-	-	-	-
14	29	-	-	-	-	-	-
15	30	3.5	4.6	-	-	-	-
15	31	1.5	2.6	-	-	-	-
15	32	3	4.2	-	-	-	-
16	33	5	6.6	-	-	-	-
17	34	4	5.8	5 (old)	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
17	35	2	3.6	-	-	-	-
17	36	1	2.3	-	-	-	-
18	37	2.5	4.7	-	-	-	-
19	38	2.5	4.5	-	-	-	-
20	39	2	3.8	-	-	-	-
21	40	3	4.2	-	-	-	-
22	41	2	4.2	-	-	-	-
22	42	1	3.4	-	-	-	-
23	43	1.5	2.6	-	-	-	-
23	44	-	2.4	-	-	-	-
23	45	-	1.2	-	-	-	-
23	46	2.5	4	-	-	-	-
24	47	4.5	6.7	-	-	-	-
24	48	1.5	2.4	-	-	-	-
24	49	-	1.3	-	-	-	-
25	50	6	6.5	-	-	-	-
25	51	2	3	-	-	-	-
26	52	4	8.8	-	-	-	-
26	53	1.5	3.1	-	-	-	-
27	54	5.5	4.9	-	-	-	-
27	55	-	4.8	-	-	-	-
27	56	-	2.6	-	-	-	-
27	57	-	3.2	-	-	-	-
27	58	-	-	-	-	-	-
28	59	7	10.8	-	5	-	-
29	60	2.5	3.9	-	-	-	-
30	61	9.5	10.2	-	-	-	-
30	62	-	0.7	-	-	-	-
30	63	-	0.9	-	-	-	-
31	64	6	7.8	-	-	-	-
31	65	5	7.2	-	-	-	-
31	66	3.5	5	-	-	-	-
31	67	-	1.5	-	-	-	-
31	68	-	1	-	-	-	-
31	69	-	-	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
32	70	2.5	2.1	-	-	-	-
33	71	3	5.2	-	-	-	-
34	72	5	6.6	-	5	-	-
35	73	3	5	-	-	-	-
36	74	2.5	2.9	-	-	-	-
36	75	1	2.6	-	-	-	-
37	76	1.5	0.6	-	-	-	-
37	77	3	4.6	-	-	-	-
38	78	2.5	3.4	-	-	-	-
38	79	-	0.9	-	-	-	-
38	80	-	0.7	-	-	-	-
39	81	3	5.3	-	-	-	-
40	82	1.5	4.2	-	-	-	-
40	83	4	4.7	-	-	-	-
40	84	1	1.7	-	-	-	-
41	85	4	5.9	5 (sediment removal)	-	-	-
41	86	1.5	2.5	-	-	-	-
42	87	2.5	3.8	-	-	-	-
42	88	5.5	7.5	40 (old)	-	-	-
42	89	-	-	-	-	-	-
43	90	3	4.6	20 (old)	-	-	-
43	91	2	2.9	-	-	-	-
44	92	6	7.7	-	5%	-	-
44	93	7.5	7.8	-	-	-	-
45	94	2	3.2	-	-	-	-
45	95	1	2.3	-	-	-	-
45	96	3.5	5.5	-	-	-	-
45	97	3.5	4.4	-	-	-	-
46	98	5	6.6	30 (old)	-	-	-
46	99	3	4.7	-	-	-	-
47	100	10	13.4	-	-	-	-
48	101	4	6.1	-	3	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
48	102	1.5	2.5	-	-	-	-
48	103	2.5	3.6	-	-	-	-
48	104		-	-	-	-	-
49	105	4	6	-	-	-	-
50	106	4	4.3	20 (old)	-	-	-
51	107	3	4.1	-	-	-	-
52	108	13	13.4	-	5	-	-
52	109	3	4.7	-	-	-	-
52	110	-	1.7	-	-	-	-
52	111	-	2.9	-	-	-	-
52	112	-	4.4	-	-	-	-
53	113	6	8.7	-	3	-	-
53	114	-	1.8	-	-	-	-
53	115	-	-	-	-	-	-
54	116	4	5.9	10 (old)	-	-	-
54	117	3	3.8	-	-	-	-
54	118	1.5	0.9	-	-	-	-
54	119	1.5	0.9	-	-	-	-
54	120	-	0.6	-	-	-	-
54	121	-	0.7	-	-	-	-
54	122	-	0.6	-	-	-	-
55	123	3.5	4.2	-	-	-	-
56	124	6.5	9.7	-	5%	-	-
56	125	6	8.3	-	-	-	-
57	126	3	3.5	5 (sediment removal)	-	-	-
57	127	-	-	-	-	-	-
58	128	12.5	13.6	-	-	-	-
58	129	-	0.7	-	-	-	-
58	130	-	-	-	-	-	-
59	131	5	6	-	-	-	-
59	132	3	4.7	-	-	-	-
60	133	2.5	3.9	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
61	134	5	6.9	5 (sediment removal)	-	-	-
61	135	3	4.5	-	-	-	-
62	136	7.5	9.6	-	5	-	-
62	137	5	5.8	-	-	-	-
63	138	6	8.1	5 (old)	-	-	-
63	139	-	0.6	-	-	-	-
63	140	2	3.5	-	-	-	-
63	141	-	-	-	-	-	-
64	142	3	4	-	-	-	-
64	143	2.5	1.6	-	-	-	-
65	144	6.5	9.2	-	5	-	-
66	145	4.5	8.3	5 (sediment removal)	-	-	-
66	146	1.5	2	-	-	-	-
66	147	1	1.8	-	-	-	-
66	148	-	1.4	-	-	-	-
66	149	2	2.4	-	-	-	-
67	150	3.5	5.3	-	3	-	-
67	151	1	2	-	-	-	-
67	152	1	0.9	-	-	-	-
67	153	3.5	2.9	-	-	-	-
67	154	4	6.1	-	-	-	-
68	155	8	11.7	-	-	-	-
69	156	2	3.3	-	-	-	-
69	157	3.5	4.9	-	-	-	-
70	158	4	6.1	-	-	-	-
70	159	2	2.9	-	-	-	-
70	160	3	4.1	-	-	-	-
70	161	-	-	-	-	-	-
70	162	-	-	-	-	-	-
23B	163	-	5.9	-	-	-	-
23B	164	-	1.6	-	-	-	-

Tag no.	Running Count Number of *Oulastrea* Colonies	Coral Diameter measured at Pre-Translocation (cm)	Coral Diameter measured at Post-Translocation (Baseline Survey) (cm)	Health Status (June 2009)			
				Partial Mortality (% Affected)	Sediment Cover (% Affected)	Blanched (% Affected)	Bleached (% Affected)
23B	165	-	1.8	-	-	-	-
23B	166	-	9.4	-	-	-	-
40B	167	-	4.1	-	-	-	-
40B	168	-	1.6	-	-	-	-
40B	169	-	3.2	-	-	-	-
40B	170	-	1.4	-	-	-	-