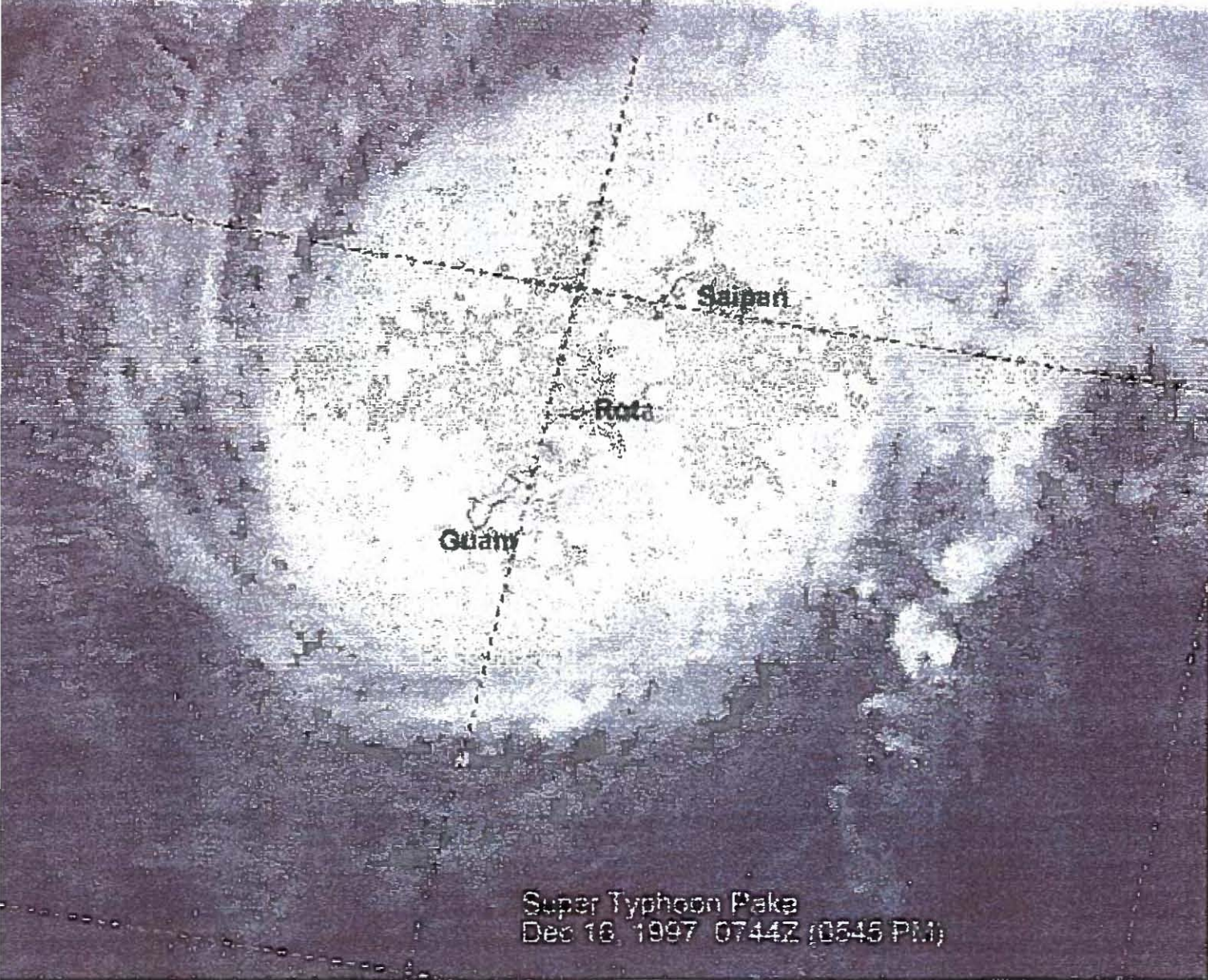




SUPER TYPHOON PAKA

Deep Water Clean-Up

**Final Report
August 7, 1998**

**Guam Coastal Management Program
Bureau of Planning
Government of Guam**



Guam is located in the primary Pacific Typhoon Track, more commonly known as Typhoon Alley. Eye passages are not uncommon, and the island is prepared. Each typhoon, however, leaves its own unique fingerprint. Paka, in 1997, scattered debris across the reef flats and in deeper waters over the reefs, in a fashion that no other storm had done in at least twenty years. It is possible that a similar pattern was experienced in Typhoon Karen in 1962, but there was no record of a clean up effort even approaching that which was necessary after Paka.



Healthy reefs are essential to Guam's economy. The reefs provide a significant food source, storm protection, and tourism base. The clean up of debris not only from the upper reef flats and lagoons but from the deeper waters as well, was essential to the community of Guam, for the Department of Defense presence on Guam, and to the U.S. efforts in coral reef protection as both a domestic and international issue.

Guam acknowledges its gratitude to all of the volunteers who helped with both the upper reef and deep water clean ups, and particularly to Department of Interior and National Oceanic and Atmospheric Administration. Mr. Allen Staymen and Ms. Nancy Boone-Fanning at DOI, and Dr. James Baker, Dr. Michael Crosby and Mr. Jeffrey Benoit at NOAA were instrumental in providing the funding and other support which made the clean up possible.

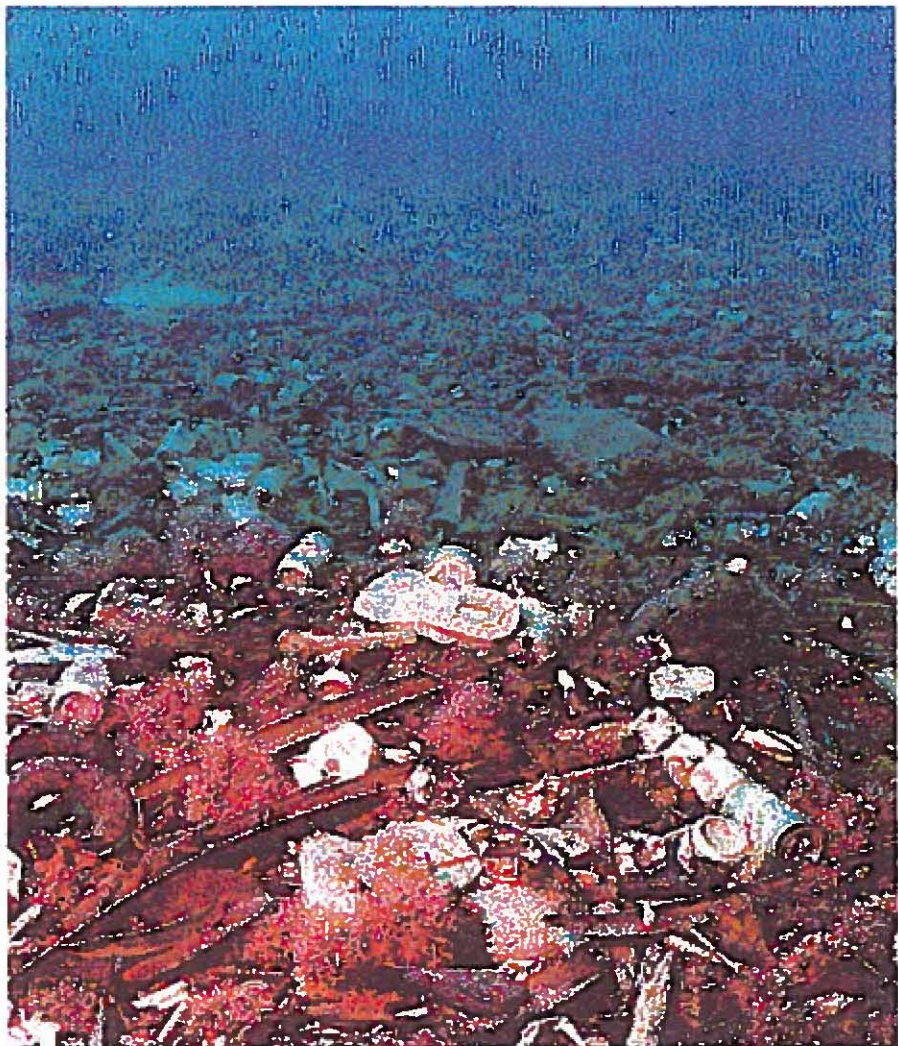
PAKA DEEP WATER CLEAN UP

Super Typhoon Paka struck Guam directly on December 17, 1998. With maximum wind gusts measured by the U.S. Air Force at 236 mph, and sustained winds ranging from 140 to 160 mph on Guam, both the human community and the natural environment sustained significant damage.

An early assessment of Guam's reefs and near shore waters showed twenty deeper areas, primarily around river mouths and areas where residential and commercial development was heaviest along the shore, with large debris fields. All of the sites are on the western side of Guam and extend from the southern tip of the island to as far north as Double Reef near Haputo Point.

Cloth, netting and other materials were wrapped around corals, large debris such as roofing tin was shading corals, and some hazardous materials presented long term potential problems to nearby corals.

The Bureau of Planning contacted both NOAA and Department of Interior, requesting funding assistance for a deep water clean up. Department of Interior provided a total of \$100,000 and NOAA provided a total of \$50,000 and additionally provided the services of Dr. Michael Crosby, who came to Guam and assisted with early assessments of specific sites, and met with the clean up contractor, and provided insight on methods which could prove most useful.



CLEAN UP

Phase 1: Diver Recruitment and Training

Within just a few days after Super Typhoon Paka passed over Guam, divers were calling the government agencies, volunteering to help with clean up efforts. After the funding was received and a contract with a professional dive company entered into (see attachment A), efforts to identify the proper participants was begun.

With over 100 applicants, 56 qualified divers were trained and used in the project. To qualify, divers were required to be certified at the Advanced Open Water level or above, be trained in First Aid/CPR, have a wetsuit or skinsuit that covered the arms and legs, compass, and safety sausages in addition to standard dive equipment.

The training phase training and on-the-job training included concerns, specific techniques, safety and dive team procedures, including navigation, use of provided On the job training was survey and/or cleanup performed. Full safety performed prior to dive.



Divers receiving safety briefing before dive.

combined both formal training. Formal environmental search and recovery emergency standards, and related subjects small lift bag use, and emergency air systems. performed on the first activity each dive team briefings were leaving port on each

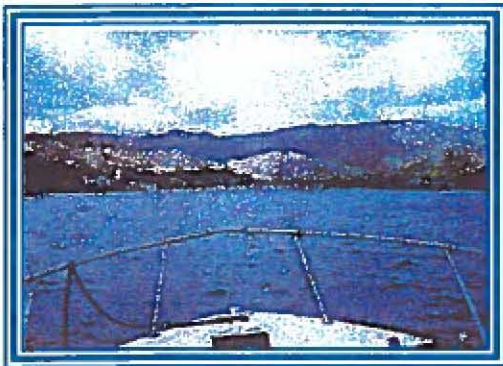


Dive team prior to survey dive.

The clean up effort formally began on May 1st, 1998, when Governor Carl T.C. Gutierrez signed the contract between the Bureau of Planning and Micronesian Divers Association (the contractor).



One of three boats used in clean up



Survey boat entering Umatac Bay.

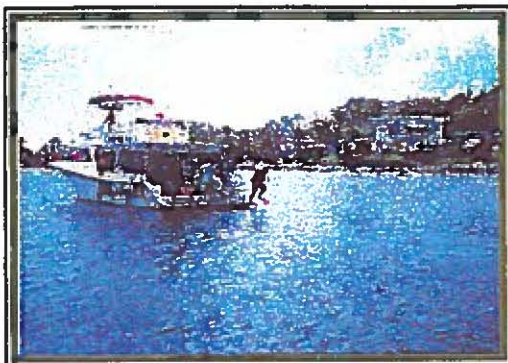
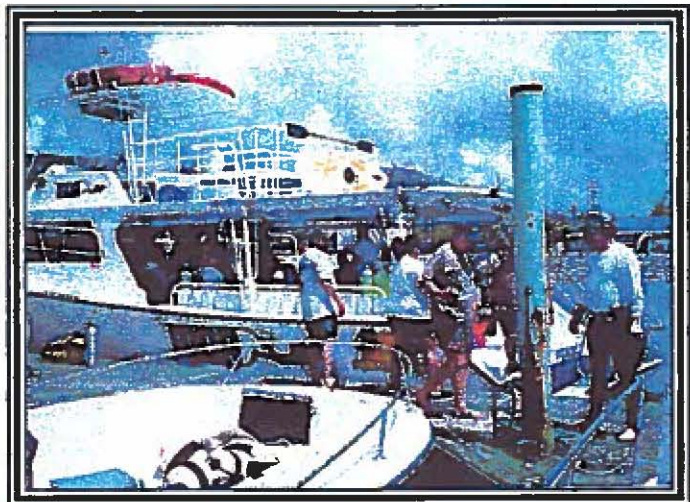
Phase 2: Survey

Sites where debris had accumulated were identified by both professional and recreational divers, and reported to the dive shops as central information points immediately after the passage of Super Typhoon Paka. The first estimates indicated that as many as twenty seven sites may require clean-up, but as sites were verified, those areas which contained "old" litter were eliminated and only those which appeared to have been

heavily impacted by Paka were listed for clean up.

Each site, seventeen in all, was searched to locate where and how much debris was located in that area. Most of the sites were located directly seaward of river outlets, and in relatively shallow waters (with depths ranging from ten feet to sixty five feet).

Both large and small boats were used to transport divers and equipment, and small boats were used as highly mobile support and safety vessels.



Survey crew in Umatac Bay.

Dive teams were given specific search areas, and common underwater search patterns were performed at varying depths. In most cases, divers were dropped at one side of a bay, within ten to twenty feet of the next diver, with buddy pairs identified beforehand, and straight line sweeps to the opposite side of the bay were completed.

When divers found objects to be directly above the items and crew recorded the amount of composition of the debris (cans, the GPS coordinates in the Site supplementary charting as



*Dr. Michael Croshy
marking location of
debris to be removed*

removed, they surfaced signaled the small boats. The debris, the depth, the general cloth, tin, furniture, etc.), and Survey Log with required.



If clean up was done on the same dive or on a subsequent dive the same day, the crew then marked the area with a buoy. The dive team then resumed its search pattern.

Phase 3: Clean Up

Upon completion clean up activities

The cleanup efforts the river run-off industrial or close proximity to include areas operations reef face to sixty and varied with



Items recovered from buoyed area

of the survey phase of an area, began immediately.

were mainly centered around areas and areas of high residential areas that are in the reef areas, but did not within Apra Harbor. Depth of extended from the top of the five (65) feet below sea level, location.

Due to some areas being somewhat or totally inaccessible from the shoreline, and due to the amount of debris on the bottom, all of the recovery efforts were performed using medium and large boats as the primary collection vehicles. This also provided the additional benefit

of not exposing the upper reef areas to a high concentration of divers and assistants walking on the reefs as the same boats were used to transport the recovery teams to and from the sites.

The recovery consisted of teams of divers first marking the selected debris areas, and then removing the debris utilizing large collection bags and/or large commercial purse-seiner nets that were raised to the surface. Emphasis was placed on removing debris that would damage coral growth and development first. Care was taken not to damage any reef areas (accomplished through thorough pre-clean up briefings and on site management).



Rescuing a Teddy Bear.



The recovery effort was very labor intensive, and dive masters coordinated the efforts to insure all safety precautions were strictly adhered to.

Items deemed too hazardous to recover using normal recovery methods were appropriately marked and scheduled for special removal.

Debris collected was deposited on the boats in appropriate bags and transported to the marina for disposal in large dumpsters.



Clean Up Results

The last dive for clean up was made on July 14, 1998.

In all, 28,245 pounds of debris, or more than 14 tons, was collected and returned to shore disposal sites, with some 95% being very small and easily removed.

Most of the items collected consisted of aluminum cans, pipe, fish net, fish line, tin roofing, sheet metal, auto parts, clothing, trash and various household items.

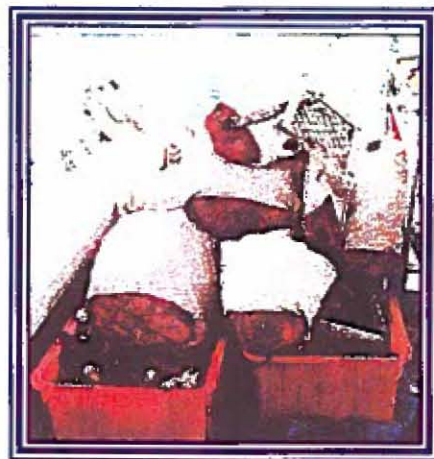


Lawn Chair seat amid trash field.

All man-made items that had been deposited at the sites recently were removed. Items that were imbedded in the coral, or had obvious coral growth on them were not removed.

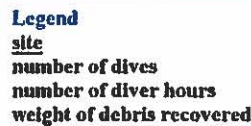


Bringing the trash home.



Bagged cans, bottles, etc.

4



CLEAN UP BY SITE

<u>Pile Bay</u>	<u>Toguan Bay</u>	<u>Umatac Bay</u>	<u>Fouha Bay</u>	<u>Cetti Bay</u>	<u>Sella Bay</u>
12 dives	2 dives	5 dives	2 dives	2 dives	1 dive
250 hours*	20 hours	70 hours	14 hours	31 hours	5 hours
7,500 lbs.	1,100 lbs.	4,800 lbs.	900 lbs.	1,600 lbs.	75 lbs.
1,2,3,4,5,6,7	1,2,3,4,6,7,8	1,2,3,4,5,6,7,8,9,10	1,3,4,5,6,7,8	1,5,6,8,11,12,13,14	1,5,6,8
<u>Nimitz Beach</u>	<u>Gaan Point</u>	<u>Namo River</u>	<u>Rizal Beach/Tipalao</u>	<u>BOQ/Orote</u>	<u>Piti Channel</u>
5 dives	4 dives	3 dives	1 dive	1 dive	4 dives
64 hours	61 hours	34 hours	8 hours	5 hours	32 hours
2,800 lbs.	2,600 lbs.	1,300 lbs.	350 lbs.	250 lbs.	1,150 lbs.
1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8,14	1,2,3,4,5,6,7,8	1,2,4,7,8	1,4,7	1,2,3,4,5,6,7,8,14,15,16
<u>Asan Cut</u>	<u>Adelupe/Agana Boat</u>	<u>Agana Bay</u>	<u>Tumon Bay</u>	<u>2 lovers - Double Reef</u>	
4 dives	4 dives	2 dives	2 dives	3 dives	
32 hours	12 hours	8 hours	6 hours	12 hours	
1,850 lbs.	875 lbs.	325 lbs.	285 lbs.	485 lbs.	
1,2,3,4,5,6,7,8,14,17	????	1,2,5,6,7,14,17	1,2,5,6,7,14,17	1,2,3,5,6,7,14,17	



From left to right: Mr. Pete Peterson (clean up contractor), Michael Ham (Administrator - Guam Coastal Management Program), Dr. Michael Crosby (Executive Director - NOAA Science Advisory Board)

Summary

It is inevitable that typhoons will continue to pass over and impact Guam. The lessons learned in Paka will be applied to future typhoons. Specific techniques for searching, locating and recovering man-made materials from our reefs were developed and perfected to produce significant and positive results. With more than fourteen tons of debris retrieved from deep waters, and approximately six tons retrieved from the reef flats, the scale of human effort cannot be underestimated.

Final Word

The clean up would not have been possible without the support of Governor Carl T.C. Gutierrez, Delegate Robert Underwood, Ms. Ginger Cruz, Bureau of Planning Director Mr. Clifford Guzman, and all the staff of the Guam Coastal Management Program. We also acknowledge the efforts of the Guam Coral Reef Initiative Coordinating Committee: Dr. Robert Richmond and the faculty and staff of the University of Guam Marine Laboratory; Mr. Gerry Davis and the Director and staff of the Guam Department of Agriculture; and Mr. Michael Gawel and the Administrator and staff of the Guam Environmental Protection Agency.

ATTACHMENT

PAKA UNDERWATER CLEAN UP CONTRACT

98-0207
RECEIVED
APR 29 1998
JUL 30 1998

CONSULTANT AGREEMENT BETWEEN THE GOVERNMENT OF GUAM

and

Micronesian Divers Association, Inc.

THIS AGREEMENT is made this _____ day of April, 1998, by and between the Bureau of Planning, an agency of the GOVERNMENT OF GUAM, whose office address is P.O. Box 2950, Agana, Guam 96932, (hereinafter called the Government) and Micronesian Divers Association, Inc. (Hereinafter called the Consultant) whose address is 856 North Marine Drive, Piti, Guam 96925.

WHEREAS, the Government intends to engage the professional services of the Consultant to provide supertyphoon Paka related debris clean-up services to the Government; and

WHEREAS, the Consultant will be appointed as a deep water debris clean-up specialist for this purpose; and

WHEREAS, the services to be rendered are of a special and temporary nature which has been determined to be in the best public interest to be performed under contract by professional personnel other than employees in the service of the Government; and

WHEREAS, pursuant to Public Law 24-117, a public emergency

exists which requires immediate action for the purpose of performing necessary restoration and mitigations which serve to benefit and promote public health, safety, sanitation and welfare; and

WHEREAS, the Consultant has been determined to possess the necessary qualifications and an interest in providing such services; and

WHEREAS, the negotiations of compensation have been determined to be fair and reasonable;

WITNESSETH, the Government and the Consultant, in consideration of mutual covenant hereinafter set forth, agree as follows:

SECTION I. PURPOSE:

To provide deep water, supertyphoon Paka debris clean-up to the Government of Guam (Bureau of Planning) relating to the aspects of locating and removing from the ocean waters, metal debris, lumber, cloth and other non-biodegradable debris deposited by supertyphoon Paka on the reef margins, reef faces and ocean floor to a depth not to exceed 75 feet.

SECTION II. SCOPE OF SERVICES: TYPE OF CONSULTATION TO BE PROVIDED.

- 2.1 The Consultant agrees to accept appointment as Consultant to the Bureau of Planning providing best efforts to the performance of duties and responsibilities as outlined below in accordance with the laws, rules, regulations, and policies of the Government.
- 2.2 The Consultant agrees to perform all of the professional services in connection with this project. These services are defined in the following attachments which are incorporated herein by reference, made an integral part hereof and marked as Exhibit B, Scope of Work.

SECTION III. CONTRACT TERM.

Subject to Section XV, the term of this Contract shall be for a total of three months, commencing on the date this Contract is approved by the Governor, and continuing for a total of ninety (90) calendar days at which time it shall terminate.

SECTION IV. CONSULTANT'S COMPENSATION FOR SERVICES.

4.1 The Government will compensate the Consultant for services performed pursuant to Section II, supra, in the total amount of one hundred fifty thousand dollars (\$150,000).

4.2 Subject to GSA Policy Office Regulations, an adjustment to the fee stated herein may be requested by the Consultant and authorized by the Government if the physical scope of work, time for completion, or services requested are increased over that agreed to.

4.3 The Government shall compensate the Consultant by progress payments based upon delivery of approved submittals of designated work as follows:

(a) The consultant will conduct on-site inspections to determine debris locations, collect video and still photography of the debris fields, make preliminary assessment of damage, and shall develop a prioritization schedule and plan for debris recovery. Upon review and acceptance of the Clean-up Plan of Action, the Consultant will be compensated in the

amount of twenty thousand dollars (\$20,000).

(b) Upon review and acceptance of a report indicating one third (1/3) of the clean-up work is complete, the Consultant will be compensated in the amount of fifty thousand dollars (\$50,000).

(c) Upon review and acceptance of a report indicating that the second one third (1/3) of the clean-up work is complete, the Consultant will be compensated in the amount of fifty thousand dollars (\$50,000).

(d) Upon review and acceptance of a report indicating that the work is completed, the Consultant will be compensated in the amount of thirty thousand dollars (\$30,000)

4.4 Final payment and release of claims: Final payment shall be made upon satisfactory delivery and acceptance of all services as herein specified and performed under this agreement. Prior to final payment, and as a condition precedent thereto, the Consultant shall execute and deliver to the Government a release, in a form approved by the Government, of claims against the Government of

Guam arising under and by virtue of this Agreement.

SECTION V. CONSULTANT AGREES:

A. That there shall be no employee benefits occurring from this Agreement, such as:

5.1 Insurance coverage provided by the Government;

5.2 Participation in the Government of Guam retirement system

5.3 Accumulation of vacation leave, or sick leave.

B. That there shall be no withholding of taxes by the Government.

C. That he will, within thirty (30) days after any claim accrues arising out of or in connection with the employment provided herein, give written notice to the Government and the Attorney General of Guam of such claim, setting forth in detail all the facts relating thereto and the basis for such claim; and that he will not institute any suit or action against the Government

in any court or tribunal in any jurisdiction based on any such claim later than one (1) year after such filing. Any action or suit on any claim shall not include any item or matter not specifically mentioned in the proof of claim above specified. It is agreed that if such action or suit is instituted proof by the Consultant of his compliance with the provisions of this paragraph shall be a condition precedent to any recovery; and that this paragraph does not constitute a waiver of any applicable statutes of limitations.

SECTION VI. GOVERNMENT AGREES TO PROVIDE THE FOLLOWING
SUPPORT SERVICES OR EQUIPMENT.

The Government will not supply any materials or equipment, office or secretarial help, or on-island transportation.

SECTION VII. SCOPE OF AGREEMENT.

This agreement supersedes any and all other agreements, either oral or in writing, between the parties hereto with respect to the retainment of Consultant by the Government and contains all of the covenants and agreements between the parties with respect to such retainment in any manner whatsoever. Each

party to this agreement acknowledges that no representation, inducements, promises or agreements, orally or otherwise, have been made by any party, or anyone acting on behalf of any party, which are not embodied herein, and that no other agreement, statement, or promise not contained in this agreement shall be valid or binding. Any modification of this agreement will be effective only if it is in writing signed by the party to be charged. For the purposes of this paragraph and of the entire agreement the signature of the Governor is the only signature that will bind the Government.

SECTION VIII. RESPONSIBILITY OF CONSULTANT:

The Consultant shall be responsible for the professional and technical accuracy of all work and materials furnished under this contract. The Consultant shall, without additional cost to the Government, correct or revise all errors or deficiencies in his/her work.

The Government review, approval, acceptance of, and payment of fees for services required under this contract, shall not be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the Consultant's failure to performance of this contract and the

Consultant shall be and remain liable to the Government for all costs of any kind which may be incurred by the Government as a result of the Consultant's negligent performance of any of the services performed under this contract.

SECTION IX. ASSIGNMENT OF AGREEMENT:

The Consultant may not assign this agreement, or any sum becoming due the Consultant under the provisions of this agreement, without the prior written consent of the Government.

SECTION X. GENERAL COMPLIANCE WITH LAWS:

The Consultant shall be required to comply with all Federal and territorial laws and ordinances applicable to the work. Consultant shall attach a copy of appropriate business license or a statement of exemption pursuant to section 16024 of the Government Code.

SECTION XI. ACCESS TO RECORDS AND OTHER REVIEW:

The Consultant, including his subcontractors, if any, shall maintain all books, documents, papers, accounting records and other evidence pertaining to costs incurred and to make such

materials available at their respective offices at all reasonable times during the contract period and for three (3) years from the date of the final payment under the contract, for inspection by the Government of Guam. Each subcontract by Consultant pursuant to this agreement shall include a provision containing the conditions of this Section XI.

SECTION XII. OWNERSHIP OF DOCUMENTS:

All briefs, memoranda and other incidental Consultant work or materials furnished hereunder shall be and remain the property of the Government including all publication rights and copyright interests, and may be used by the Government without any additional cost to the Government.

SECTION XIII. INDEMNITY:

Consultant agrees to save and hold harmless the Government, its officers, agents, representatives, successors and assigns and other governmental agencies from any and all suits or actions of every nature and kind, which may be brought for or on account of any injury, death, or damage arising or growing out of the acts or omissions of the Consultant, Consultant's officers, agents, servants or employees under this agreement.

SECTION XIV. CHANGES:

The Government may at any time, by written order make any change in the services to be performed hereunder. If such changes cause an increase or decrease in the costs of doing the work under this agreement, or in the time required for this performance, an equitable adjustment shall be made and the agreement shall be modified in writing accordingly.

SECTION XV. TERMINATION:

Either of the parties hereto, may, by written notice to the other, terminate this agreement in whole or in part at any time, either for convenience or default. Upon such termination, all briefs, reports, summaries, completed work and work in progress, and such other information and materials as may have been accumulated by the Consultant in performing this agreement shall, in the manner and to the extent determined by the Government, become the property of and be delivered to the Government. If the contract is terminated by the Consultant, or by the Government for cause, prior to its completion, Consultant shall reimburse the Government for any travel costs associated with this contract and the Government may retain as a setoff for such expenses any funds owed to Consultant in the Government

possession. Consultant will, however, be paid the reasonable value for services performed that are acceptable to the Government.

SECTION XVI. SEVERABLE PROVISIONS:

If any provision of this agreement shall be deemed by a court of competent jurisdiction to be invalid, then such provision shall be deemed stricken from the agreement and the agreement shall be enforced according to its valid and subsisting terms and provisions.

SECTION XVII. GOVERNING LAW:

The validity of this Agreement and of any of its terms or provisions, as well as the rights and duties of the parties to this Agreement, shall be governed by the laws of Guam.

SECTION XVIII. EFFECTIVE DATE OF AGREEMENT:

This agreement shall take effect upon the date it is signed by the Governor of Guam and the date of this Agreement shall be the date upon which the Governor affixes his signature.

SECTION XIX. GOVERNMENT NOT LIABLE:

A. The Government assumes no liability for any accident or injury that may occur to the Consultant, his or her agents, dependents, or personal property while enroute to or from this territory or during any travel mandated by the terms of this agreement.

B. The Government shall not be liable to Consultant for any work performed by the Consultant prior to the approval of this Agreement by the Governor and Consultant hereby expressly waives any and all claims for service performed in expectation of this Agreement prior to its approval by the Governor.

IN WITNESS WHEREOF, the parties have entered into this Agreement on the dates indicated by their respective names.

DEPARTMENT OF EDUCATION
DIVISION OF

Registration Date 5/8/98
Registered No. C980602830
Book No. 2
Registered By [Signature]

CONSULTANT

[Signature]

PETE PETERSON
President
Micronesian Divers Assoc. Inc

Date: 4/27/98 4/27/98

CERTIFIED FUNDS AVAILABLE:

Carmelita C. Blas
CARMELITA BLAS
Certifying Officer
Bureau of Planning

Date: 4/27/98

ACCOUNT NO.: 5101H980930TP199-230

DOCUMENT NO. C980900001

VENDOR NO. /

AMOUNT: \$150,000.00 4/27/98

APPROVED AS TO FORM:

[Signature]
GUS F. DIAZ, Acting
Attorney General

Date: 4/30/98

GOVERNMENT OF GUAM

[Signature]
CLIFFORD A. GUZMAN
Acting Director
Bureau of Planning

Date: APR 24 1998

APPROVED:

Joseph Rivera
JOSEPH RIVERA
Acting Director, Bureau of
Budget and Management Research

Date: APR 30 1998

APPROVED:

[Signature]
CARL T.C. GUTIERREZ
Governor of Guam

Date: 5-1-98

EXHIBIT A

Scope of Work

Supertyphoon Paka struck Guam directly on December 17, 1998. With maximum wind gusts measured by the U.S. Air Force at 236 mph, and sustained winds ranging from 140 to 160 mph on Guam, both the human community and the natural environment sustained significant damage. An early assessment of Guam's reefs and near shore waters showed twenty deeper areas, primarily around river mouths and areas where residential and commercial development was heaviest along the shore, with large debris fields. All of the sites are on the western side of Guam and extend from the southern tip of the island to as far north as Double Reef near Haputo Point. Cloth, netting and other materials are wrapped around corals, large debris such as roofing tin is shading corals, and some hazardous materials present long term potential problems to nearby corals. The debris in deep waters requires a professional approach for removal. The scope outlined herein addresses that approach

The scope of work for the clean-up includes all manpower, boats, equipment, and miscellaneous equipment. It does not include any "land-based" cleanup or recovery vehicles or containers, which will be provided by the Government of Guam.

The cleanup efforts will be mainly centered around the river run-off areas and areas of high industrial or residential areas that are in close proximity to the reef areas. Other areas will be selected and prioritized directly from diver reports of debris. General site parameters are located on the accompanying map, marked Exhibit C, and do not include areas within Apra Harbor. Depth of operations extend from the top of the reef face to sixty five (65) feet below sea level, and vary with location.

Due to some areas being somewhat or totally inaccessible from the shoreline, and due to the amount of debris on the bottom, almost all of the recovery efforts will be performed using medium and large boats as the primary collection vehicles. This will also provide the additional benefit of not exposing the upper reef areas to a high concentration of divers and assistants walking on the reefs as the same boats will be used to transport the recovery teams to and from the sites.

The recovery operation will begin with an on-site assessment of the type and amount of debris at the designated areas. It is estimated that this assessment phase will take approximately one-two weeks, with recovery efforts following directly. Initial assessments began immediately after Paka, from divers generalized reports.

Recovery Operation Consultant Responsibilities

Generally, the recovery will consist of teams of divers first marking the selected debris

areas, and then removing the debris utilizing large collection bags and/or large commercial purse-seiner nets that will be raised to the surface. Emphasis will be placed on removing debris that will damage coral growth and development first. Care will be taken not to damage any reef areas (accomplished through thorough pre-clean up briefings and on site management).

The recovery effort is very labor intensive, and due to the natural safety restrictions of depth and time associated with diving, it is estimated that teams of up to 20 divers will be used at each site. Divemasters will coordinate the efforts to insure all safety precautions are strictly adhered to. Divers will be equipped with protection suits, gloves and collection bags.

Items deemed too hazardous to recover using normal recovery methods will be appropriately marked and scheduled for special removal.

Debris collected will be deposited on the boats in appropriate bags and transported to the marina for disposal (typically in large dumpsters or vehicles). This activity will be coordinated with the responsible government collection agencies.

It is anticipated that the operation can be completed in a three month period. This is based upon the normal calm conditions that prevail on the western side of Guam until mid July. Work can commence within three weeks after approval.

The Consultant will provide the Government of Guam with a recovery plan before work commences, in order for review and approval as coordinated by the Bureau of Planning.

The Consultant will provide the Government of Guam with progress reports at the one-third, two-thirds and final recovery completion stages. These reports will include documentation on the estimated amounts of recovered items (either estimated weights, numbers or cubic yardage: for example: 200 pieces of roofing tin, etc.), the categories of recovered items (metal, cloth, wood, hazardous materials [specified]), and generalized mapping of debris recovery.

These reports will also include information on the recovery process, including manpower utilization and other data which would be useful in developing a recovery plan for future operations. Such data would include, but not be limited to description of problems, unanticipated factors, etc.

These reports will also include a location and brief description of sites where damaged corals are observed in order to develop a Government coordinated restoration or rehabilitation response.

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///////// nothing follows //////////



GUAM

AREA B

Approximate Boundaries For Reef
clean-up

Area 1