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HEADQUARTERS
JOINT TASK FORCE SEVEN
APO 187 (HOW) c/o POSTMASTER
SAN FRANCISCO, CALIFORNIA

J-3/729.3

18 March 1954

SUBJECT: Radiological Surveys of Several Marshall Island Atolls

410258

TO: Distribution

1. Attached herewith for your information and retention are copies of radiological surveys made on certain Marshall Island Atolls. The surveys were conducted as a result of contamination deposited on the affected atolls by BRAVO Shot, Operation CASTLE, fired from a reef approximately one and one half nautical miles southwest of Namu, Bikini Atoll. BRAVO Shot time was 1845 Zebra, 28 February 1954.

2. Water and soil samples were shipped to the Health and Safety Laboratory, New York Operations Office, Atomic Energy Commission (Attention: Mr. Merrill Eisenbud) for analysis.

FOR THE COMMANDER:

E. McGinley

E. McGINLEY
Brigadier General, U.S. Army
Chief of Staff

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3 Incls:
1. Report on Soil and Water Sampling Mission by Maj R. D. Crea
2. Report on Soil and Water Sampling Mission by Dr. T. N. White, LASL
3. Rad. Survey of Downwind Atolls Contaminated by BRAVO by Dr. Herbert Scoville

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SRD-213-54E

HEADQUARTERS
JOINT TASK FORCE SEVEN
APO 187 (HOW) c/o POSTMASTER
SAN FRANCISCO, CALIFORNIA

COMPT 8 March 1954

SUBJECT: Report on Soil and Water Sampling Mission

TO: Commander
Joint Task Force SEVEN
APO 187 (HOW)
c/o Postmaster
San Francisco, California

1. In compliance with your oral instructions, the undersigned visited LIKIEP and AILUK Atolls, JEMO Island and MEJIT Island in the Eastern Marshalls between the period 5-8 March 1954 for the purpose of collecting soil and water samples and measuring level of gamma radiation present at those places in connection with BRAVO. The mission, consisting of the undersigned and a Marshallese interpreter, Lan Lakapun, embarked on the USS BENSHAW (DDE499) at Kwajalein, visited the four sites and returned to Bikini, where the remainder of the trip to Eniwetok was performed by PBM. There follows a detailed discussion of the findings at each location:

a. LIKIEP ATOLL. The samples were taken on Likiep Island, which had the largest native population. Access to the lagoon was gained through South Pass. Poor light at the end of the day and numerous coral heads necessitated anchoring about 4 miles from Likiep Island. Trip in was made by whaleboat the following morning. A water sample was taken from a large cistern fed from the roof of the Catholic rectory, and earth samples were taken from random spots about the island which were unsheltered by trees or other growth at approximately 0800 M 6, March 1954. Radiation readings were takn with a MX-5 instrument between 0800 M and 0900 M and showed a maximum of 3 milliroentgens per hour. No variations from this reading were noted on clothing or bare feet of individuals. According to accounts received by Bishop Feeney, S.J., the population was greatly excited by the light and blast wave, the latter which reportedly arrived about 30 minutes subsequent to the light flare. According to Bishop Feeney, church attendance was greatly stimulated on the day of the test.

b. JEMO Island. This location was reached at 1100 M, 6 March 1954. It consists of a small heavily wooded island, surrounded by a line coral reef with heavy surf on three sides. There being no place for landing a whaleboat, personnel and equipment were transferred from the whaleboat to the reef by a one man rubber raft. The undersigned transferred himself by swimming. The island proved to be uninhabited, and reportedly is a sea turtle preserve. Turtle hunters erected several houses, a rain barrel of which provided a water sample. Earth samples were gathered at random from open areas, including one of beach sand above the high tide mark. The party was led straight across the island and back to the landing area via the beach, in order to verify its uninhabited state. Samples were

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collected at approximately 1200 M, 6 March 1954. Instrument readings with the MX-5 showed a maximum of 3 mr/hr, however this was not considered reliable, since a higher scale showed a lower reading.

c. AILUK ATOLL. The ship reached this atoll at approximately 1600 M, 6 March 1954, and slowly moved to an anchorage off Ailuk Island, the most heavily populated. The lagoon has not been swept, and numerous coral heads and pinnacles provided considerable hazard to ship movement. The landing party moved ashore by whaleboat without difficulty, and again obtained water samples from the most prominent cistern and soil samples from random unsheltered spots. Readings with the MX-5 showed approximately 3 mr/hr (off the 2 mr scale). An AN/PDR-27E showed a high reading of 7 mr/hr, however, on a different scale a reading of 12 or 15 mr/hr was obtained. The MX-5 reading is probably nearest correct. No significant variations were detected on bare feet or clothing of individuals. Samples and readings were taken at approximately 1700 M, 6 March 1954.

d. MEJIT Island. This single coral island is also surrounded by a reef, as is JEMO, but landing was possible with a whaleboat, due to an area protected from the surf. The island was found to be heavily populated in view of its size, the total number of people being 327, according to the island magistrate. Soil and water samples were taken as in the previously described manner, at approximately 1300 M, 7 March 1954. Readings with the MX-5 showed maximum of approximately 3 mr/hr (off the 2 scale, but approximately 1.5 on the 20 scale); the maximum reading with a PDR 27 E was 10 mr/hr. The true figure was probably somewhere between the two.

2. CONCLUSIONS. Low level (less than 10 mr/hr) radiation measurements with field instruments of the type used are highly unsatisfactory. One MX-5 and three AN/PDR 27 E instruments all showed widely variant readings on different scales, and varied among each other when exposed to the same radiation. An AN/PDR T1-B proved completely useless not holding to zero even after an hours warm-up, and also showing widely variant readings on different scales.

3. RECOMMENDATIONS. Landing parties in islands such as JEMO and MEJIT should be provided with a rubber 6-man or 8-man pneumatic boat, to provide greater safety to personnel and equipment. This will permit landing directly on live coral reefs with less danger of the boat being stove in. Ships assigned to such missions should draw such equipment prior to departure.

4. The successful accomplishment of the mission was greatly facilitated by the interest and enthusiasm of the Commanding Officer of the USS RENSHAW, CDR L. H. Milford, USN, and his officers and men. Their material contributions were necessary to the mission, however, the many valuable suggestions and assistance in solutions of problems proved invaluable.

/s/ R. D. Crea
R. D. CREA
MAJ, USA

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MEMORANDUM FOR: CJTF SEVEN

10 March 1954

SUBJECT: Report on Soil and Water Sampling Mission

1. In compliance with your oral instructions, the undersigned visited Wotje, Erikub, Maloelap, Wotho, Majuro Atolls in the Marshall Islands 5 through 7 March 1954 for the purpose of obtaining earth and drinking water samples, and of measuring gamma ray dose rates, and also checked the radiological condition of the S.S. ROQUE on its arrival at Majuro 7 March 1954.

2. The first four atolls were visited by Marshallese interpreter Takushi and the writer by means of an UF-1 amphibious aircraft. Majuro was reached by C-47. Erikub might have been omitted since it was not inhabited, being property of the Wotje tribe which goes there only occasionally to gather copra. (This was unknown until after the visit.)

3. At each atoll, only the principal inhabited island was visited. At each visited island an effort was made to compose a representative soil average by collecting into a single container several samples, each approximately one square foot of area and one inch depth. Water samples were collected from the principal sources currently in use. The gamma dose rates are averages for the inhabited areas.

4. With regard to certain minor discrepancies between the survey methods us[ed] by Major R. D. Crea and the writer; it was originally planned to perform the surv[ey] jointly, and when it became advisable to separate and survey different atolls, no time remained for discussion of details of techniques.

5. Gamma-ray dose rates on Wotje and on Erikub are each the average of MX-5 and AN/PDR-39 average readings which agreed reasonably well. The MX-5 was render inoperative when the rubber life raft was swamped by surf on the first attempt to launch from the beach at Erikub. Following the Wotho survey, the PDR-39 developed a temperature-dependent reading of 0.4 - 2 mr/hr, so that later readings in this range are of very dubious reliability.

6. The following tabulation summarizes the atoll survey. S is Soil, W is Water Sample:

ATOLL	ISLAND	DATE	TIME	SAMPLE NO	MR/HR & SAMPLING
WOTJE	ORMED	5 Mar	1600	S5	3.5 mr/hr, 1-beach, 3-mid-village, 1-back village.
				W6	½ well plus ½ catch basin.
ERIKUB	ERIKUB	5 Mar	1715	S6	1.5 mr/hr. 1-mid-village, 1 on path to beach. No inhabitants, no water supply found.

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ATOLL	ISLAND	DATE	TIME	SAMPLE NO	MR/HR & SAMPLING
MALOELAP	KAVEN	6 Mar	1130	S7	1.8 mr/hr, 2-village, 2-path to beach.
				W12	Well water.
				W13	From catch basin.
WOTHO	WOTHO	6 Mar	1615	S8	0.8 mr/hr, 1 by well; 2-mid-village.
				W9	Well water (no rain in catch basin for 2 mo.)
MAJURO	ULIGA	7 Mar	1200	S9	0.5 mr/hr, 4 from near Admin Bldg.
				W10	Tap water.

7. Pacific Micronesian Line S.S. "ROQUE", Master: Lawrence Blanc, home port, Guam, left Ebeye 0840 M on 1 March, entered channel to Utirik Lagoon about 1200 M on 2 March, and anchored in Lagoon at 1524 M on 2 March; docked at Majuro (Uliga Is.) 1630M on 7 March. Readings (mr/hr) after docking: 2-3 inside main deck structure, 10 on open deck, 5-8 in sleeping quarters on upper deck, 10-30 on rope and canvas. Prior radiation levels cannot be estimated because of rain squalls and uncertainty about when decks last washed. Master was advised to have decks washed down as soon as convenient. He was told that the activity would not hurt anyone, but that it was undesirable to have it around longer than necessary.

8. RECOMMENDATIONS: Future visits to Erikub and Maloelap should not be attempted by UF-1 except under conditions of greater urgency. The writer's prior experience in such operations is very limited, but from his own observations plus the remarks made by those better qualified to judge, it appears that a fair amount of risk is involved.

9. Especially notable was the very cooperative attitude of the Navy person at Kwajalein and the Marshall District Administrative Officials at Majuro in supporting this mission.

/s/ T. N. White
DR. T. N. WHITE
Health Division
LASL

1 Incl:
Marshall Islands Atoll
Samples collected by T. N.
White, 5-7 March 1954

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MARSHALL ISLANDS ATOLL SAMPLES COLLECTED BY T. N. WHITE, 5-7 MARCH 1954

Earth samples were collected as follows:

At each island visited several samples were dug and put into the same one-gallon "ice-cream carton". Each sample (i.e. each digging) approximated one square foot to a depth of one inch. The number and locations of the samples were selected to represent, as well as could be judged, an average of the areas used by the inhabitants, after the samples were mixed in the carton. Areas that were unusually shaded or unshaded by trees were avoided. The large "pebbles" in the composite represent coral gravel from "main street" through the village.

Water samples were selected according to the principal source in current use

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