410318

Tommy: Lets find out how much we can spend & get Jeg. to get some money to them. LB.

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

College of Fisheries
Laboratory of Radiation Ecology

April 26, 1974

Mr. Tommy McCraw
Nuclear Explosives Environmental
Safety Branch
Division of Operational Safety
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Tommy:

Attached is my intralaboratory trip report for the March-April 1974 trip to Utirik, Rongelap and Bikini Atolls. This report covers my activities for the trip, but since Nat Greenhouse, Joe Ash, and I were working together much of the time, the report also covers many of their activities in the field.

The ^{55}Fe and ^{90}Sr analysis for soil, coconut crabs, fish, and Pandanus samples collected at Bikini Atoll in May 1972 will be completed by the end of April. I will forward these data to Ollie as soon as I have checked and tabulated the data. These data should complete the information necessary to finish the report on the May 1972 Bikini Radiological Resurvey.

Sincerely yours,

Vic

Victor A. Nelson
Fisheries Biologist

VAN:ah

Attachment

TRIP REPORT

Utirik - Rongelap - Bikini
Environmental Sampling

March-April 1974

Personnel: Vic Nelson - Laboratory of Radiation Ecology
Nat Greenhouse and Joe Ash - Brookhaven, Health Physics Division

The above personnel conducted an environmental sampling program in conjunction with the medical team making the annual AEC-sponsored medical survey in the Marshall Islands. The 17-member medical team was led by Dr. Robert Conard (BNL). Mr. William Streenan (AEC, Hono) and Mr. John Rosario (staff, Congress of Micronesia) also were present.

Objective: The purpose of the environmental sampling was: (1) to familiarize Nat Greenhouse and Joe Ash with various aspects and problems of working and sampling in an atoll environment and (2) to conduct a limited sampling program designed to provide data to correlate with the body burden data from the medical studies. The environmental sampling program was limited, since this program will not be funded until fiscal year 1974-75.

26 March (Tuesday) - Vic Nelson took the 0930 flight from Seattle to Honolulu.

27 March (Wednesday) - Vic Nelson took the 0800 MAC flight from Honolulu to Kwajalein. In Kwajalein he was met by John Stewart and Bill Streenan (AEC) and Harry Hauck (Global Assoc.). Later, he met Nat Greenhouse and Joe Ash who had flown to Kwaj. on Monday.

28 March (Thursday) - Packed and loaded gear on LCU.

29 March (Friday) - 1700. LCU departed Kwaj for Utirik (200 miles).

30 March (Sat.) - Enroute to Utirik. At 1200 we were NW of Likiep Atoll.

31 March (Sun.) - 0845. Through pass into Utirik Lagoon.
1100 - Landed at village on Utirik Island. The LCU grounded about 30 yards out from the beach, due to the shallowness of the water. It was thus necessary to ferry men and equipment back and forth in a rubber raft supplied by John Philips of the LCU crew.

Afternoon - LCU unloaded, after which Nelson, Greenhouse, and Ash made a tour of the island, during which some survey meter readings were taken (< 1μR/hr) and a few rat traps were set.

1 April (Monday) - Utirik I. Greenhouse and Nelson collected leaves and fruit from breadfruit, pandanus and coconut trees. Surface soil samples (1" deep x 3.5" diameter) were also collected around the base of each sampled tree. Ash filtered water from a well in the village. Nelson also collected two goatfish and two kuhlia.

2 April (Tuesday) - Utirik I.

0645-0830 - Nelson Young (engineer, LCU-26) and Nelson fished in lagoon and on reef at the north end of Utirik Island. Four yellowtail mullet were taken in the lagoon. Nelson also obtained sediment samples at the north end of the island and at the boat landing. Both samples were from the lagoon in 3-4 feet of water. Nelson also collected algae at the boat landing. A soil sample was taken from the taro patch behind Henos' house in the village.

1400 - Departed Utirik Island.

1500 - Cleared pass.

3 April (Wednesday)

1200 - Off Rongerik Atoll. Rongelap Atoll cannot be seen.

1800 - Entered south pass into Rongelap lagoon. Old weather tower gone from Jabwon.

1900 - Landed at Rongelap Island.

4 April (Thursday) - Rongelap I.

AM - Council meeting. Dr. Conard introduced group to the Rongelap people and explained the examinations and studies to be conducted. The people asked many questions about radiation in food and about whether they would receive any money as compensation for travel to Majuro or Ebeye for medical exams.

PM - Ash began filtering water from a cistern and a well. Greenhouse and Nelson, helped by Bolden (son of Nik), collected fruit and leaves from Pandanus, breadfruit and coconut trees both at the east end of the main village and in the center of the village. Soil samples were also taken around each of the six trees. A copra sample was obtained for us by Bob Harrison, the Peace Corps volunteer on Rongelap. The copra was made from coconuts collected at the east end of the village.

Surface soil samples were collected just off the trail leading from the church to the ocean as follows:

#1. Beach sand, lagoon.
#2. Just behind cleared area of village under a Pandanus tree.
#3. 200 yards into the coconut area.
#4. At the first marked bend in the trail at about the center of the island.
#5. Seaward edge of the coconut grove about 100 yards inland from the ocean.
#6. Beach sand, ocean side.

Scaevola, Messerschmidea, and Guettarda leaves were collected 50 yards north of the church to ocean trail, about 20 yards inland from the ocean. A soil sample was also taken.

Greenhouse and Ash also made survey meter readings in the village area (1-2 μR/hr).

5 April (Friday) - Rongelap I.

AM - Greenhouse, Nelson, Streenan, Maudrik (seaman, LCU-26) and Bolden went to Jabwon (west end of Rongelap I). Greenhouse and Bolden collected Pandanus, breadfruit, coconut and soil samples near the house of Bolden's grandfather, Alex. The others collected goatfish and convict surgeon. Survey meter readings were taken from Jabwon to Rongelap Village on the way back (3 μR/hr average).

PM - Launched 17' Boston Whaler.

6 April (Saturday) - Eniaetok I.

0830 - Nelson, Greenhouse and Kosang (X-ray tech., Trust Territroty) went to Eniaetok Island on the Boston Whaler. The 10-mile trip took 25 minutes on calm water.

On Eniaetok we collected Pandanus and coconut fruit and leaves from trees just north of the building with the bell on the front door. Breadfruit leaves were taken by house on the trail to the ocean near the north end of the island. Scaevola and Messerschimidea leaves were also collected in the village area. Soil samples were taken around each tree. Survey meter readings were taken in the village area and along the trail to the beach (3 μR/hr average). A sediment sample was taken in 110 feet of water off the north end of the island.

1200 - Left Eniaetok I. for Busch I. Survey meter readings were made on Busch I (3 μR/hr in the interior and <3 μR/hr on the edge of the island). Nelson caught two coconut crabs.

7 April (Sunday) - Kabelle and Gabelle I.

1000 - Nelson, Greenhouse and Jobwe left Rongelap in the Boston Whaler for Kabelle I. on the NE corner of the atoll. We arrived at Kabelle at 1130, after a rough trip. We collected coconut fronds and nuts from a tree next to the water catchment. Pandanus and Scaevola leaves were collected in the center of the island. Surface soil samples were taken around all trees. An 8" (2" increments) soil profile was taken near the Pandanus tree. Jobwe shot two rails (Koak). We caught three coconut crabs and two Tridacna clams. Survey meter readings averaged 10 μR/hr. The highest reading was 20 μR/hr near the water catchment. A sediment sample was taken in an undisturbed area of the lagoon in about 8 feet of water.

1400 - Left Kabelle I.

1430 - Arrived Cabelle I. On Gabelle we obtained a pig for a sample, and also took survey meter readings--highest, 10 μR/hr, average 7 μR/hr.

8 April (Monday) - Rongelap I.

Rearranged samples in freezers. Two coconut crabs were collected for us by Nelson Anjain (Magistrate on Rongelap) at Arbor Island. He and several other people caught about 30 coconut crabs for a feast held that night.

9 April (Tuesday) - Rongelap I.

AM - Nelson obtained a sediment sample from the lagoon off the boat landing at Rongelap I. We also caught an octopus near the LCU. A pig and chicken were also obtained for samples. Packed gear in preparation for trip to Bikini Atoll.

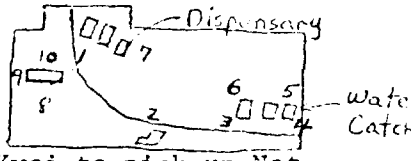
1700 - LCU departed Rongelap Atoll.

10 April (Wednesday) - Bikini I.

0800 - LCU arrived on Bikini I.

1000 - Ash began filtering water from the cistern behind the first house by the boat landing.

100-1230 - Nelson and Ash took surface soil samples and γ-survey readings around the work camp area on the south end of the island.



PM - LCU went to Enyu I. to meet C-54 chartered from Kwaj to pick up Nat Greenhouse, who had appendicitis, and the majority of the medical team who had been scheduled to leave the next day anyway. Ash and Nelson made a few γ readings along the lagoon side of the runway while the plane was being loaded. LCU then returned to Bikini I.

11 April (Thursday) - Bikini I.

AM - Nelson and Ash took surface soil samples and gamma readings along lagoon road from the north end of the island to the boat landings. Samples and readings were taken ten paces inland from the road about every 0.2 mile. Soil samples numbered as follows:

#1. North end of island to 2nd Base line north.
#2. 2nd BLN to 1st BLN.
#3. 1st BLN to Center base line.
#4. Center BL to 1st Base line south.
#5. 1st BLS to 2nd BLS.
#6. 2nd BLS to work camp.

We also took 5 lagoon-to-ocean transects, making γ readings and collecting surface soil samples and coconut fronds. These transects are as follows:

#1. 2nd Base line south.
#2. 1st BLS
#3. Center BL
#4. 1st Base line north
#5. 2nd BLN

For transects #1, 2 and 3 the soil and fronds were collected at the 2nd tree south of the road, while for transects #4 and #5 the samples were taken at the 2nd tree north of the road.

PM - Nelson and Ash took surface soil samples, coconut fronds and γ readings along coconut rows 24 and 34 from the center base line to the 2nd base line south. Samples were taken at every 15th coconut tree, starting with the tree south of the center base line or 1st BLS. These samples were composited for four areas as follows:

#1. Center base line to 1st BLS - Row 24.
#2. 1st BLS to 2nd BLS - Row 24
#3. Center BL to 1st BLS - Row 34
#4. 1st BLS to 2nd BLS - Row 34

The row numbers are the numbers given to the original rows of coconut trees and are those used in reports of the 1969-70 and 1972 surveys. A row of coconut trees has since been planted between the original rows of trees.

Nelson and Ash began a gamma survey of the houses.

12 April (Friday) - Bikini Island

AM - Ash continued gamma survey of houses.

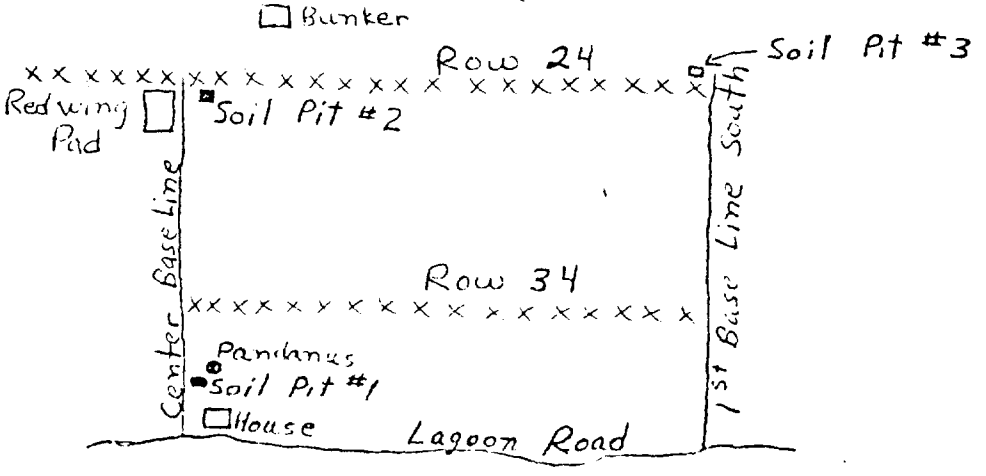
Nelson had a backhoe operator dig three soil pits in the following areas:

#1. Ten yards south of the center base line and 30 yards inland from the first house south of the center base line. This pit is about 8 feet from a Pandanus tree from which fruit and leaves were collected. This pit had a mixture of dark organic soil and coral gravel to a depth of about 100 cm, and coral sand below 100 cm.

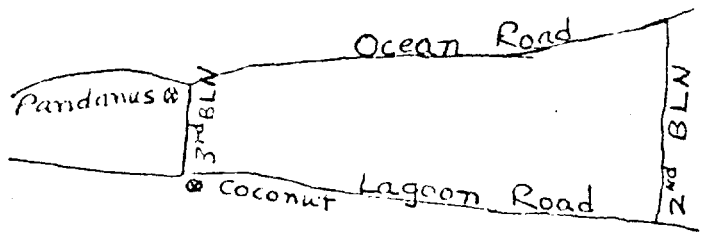
#2. Ten yards south of the center base line on Row 24. This pit had a mixture of black organic soil and coral gravel from 0-30 cm, black organic soil and coral sand from 30-75 cm, and coral sand below 75 cm.

#3. Five yards north of 1st Base line south on Row 24. This pit had fine dark organic soil from 0-35 cm, light gray coral sand from 35-50 cm, lighter shade of coral sand from 50-75 cm and white coral sand below about 75 cm.

Soil samples were taken by side wall sampling from these three soil pits at the following intervals, in cm, 0-2.5, 2.5-5, 5-10, 10-15, 15-25, 25-35, 35-50, 50-75, 75-100, 100+. These intervals varied in some cases, due to differences in soil horizons between the pits.



PM - Nelson and Ash collected fruit and leaves from a Pandanus and a coconut tree near the 3rd base line north. Messerschmidea leaves were also collected. Soil samples were taken at the base of the trees.



Nelson and Ash continued γ-survey readings inside and around houses. All houses are completed and are relatively cool inside. The outbuildings (outhouses, water catchments and cook areas) are completed on about a third of the houses.

13 April (Saturday) - Bikini Island

AM - Ash and Nelson made gamma readings and collected soil and coconut fronds in the following areas:

#1. Center base line to 1st BLN, Row 24.
#2. 1st BLN to 2nd BLN, Row 24.
#3. Center base line to 1st BLN, Row 34.
#4. 1st BLN to 2nd BLN, Row 38

We also purchased a coconut crab taken on Bikini I. by one of the workers.

14 April (Sunday)

Collected papaya sample from area behind house #2 and obtained some yams and a chicken from one of the workers.

1530 - LCU departed Bikini I.

15 April (Monday) - Enroute to Kwaj.

16 April (Tuesday) - 1230. LCU arrived at Kwaj.

17 April (Wednesday)

1500 - Nelson and Ash left Kwaj for Hono via MAC.
2130 (Hono time) - Arrived Hickam. We had some difficulty in getting plant and pig samples through Department of Agriculture due to lack of specifics on permit.

18 April (Thursday)

0930 - Nelson left Honolulu for Seattle.
1800 (Pacific Daylight Time) - Arrived Seattle.
1900 - Arrived at University of Washington.

Victor A. Nelson
Laboratory of Radiation Ecology
April 25, 1974

SAMPLE LIST

UTIRIK ATOLL

Sample Type	Collection Date	Island	Location
Breadfruit - leaves	1 April 1974	Utirik I.	Jakaj house
" fruit	"	"	"
Surface soil	"	"	"
Water	"	"	" (well)
Pandanus - leaves	"	"	Land of Henos
" fruit	"	"	"
Surface soil	"	"	"
Coconut - fronds	"	"	Village area
" fruit	"	"	"
Surface soil	"	"	"
Goatfish	"	"	Lagoon
Surface soil	2 April 1974	"	Taro patch
Lagoon sediment	"	"	North end island
"	"	"	Boat landing
Mullet	"	"	Lagoon

SAMPLE LIST

RONGELAP ATOLL

Sample Type	Collection Date	Island	Location
Pandanus - fruit #1	4 April 1974	Rongelap	East end of village
" leaves #1	"	"	"
Surface soil	"	"	"
Coconut - fruit #1	"	"	"
" frond #1	"	"	"
Surface soil	"	"	"
Breadfruit - fruit #1	"	"	Manewljo's house
" leaves #1	"	"	"
Surface soil	"	"	"
Breadfruit - fruit #2	"	"	Behind dispensary
" leaves #2	"	"	"
Surface soil	"	"	"
Coconut tree - fruit #2	"	"	Behind PCV house
" fronds #2	"	"	"
Surface soil	"	"	"
Pandanus - fruit #2	"	"	Two houses west PCV
" leaves #2	"	"	"
Surface soil	"	"	"
Copra	"	"	East end village
Scaevola leaves	"	"	Ocean side
Messerschmidea leaves	"	"	"
Surface soil	"	"	"
Surface soil transect (6 samples)	"	"	Church to ocean trail
Arrowroot tubers	"	"	"

RONGELAP ATOLL (cont)

Sample Type	Collection Date	Island	Location
Pandanus fruit	5 April 1974	Rongelap	Jabwon - Alex's house
" leaves	"	"	"
Surface soil	"	"	"
Breadfruit - fruit	"	"	"
" leaves	"	"	"
Surface soil	"	"	"
Coconut fruit	"	"	"
" fronds	"	"	"
Surface soil	"	"	"
Goatfish	"	"	Jabwon
Convict surgeon	"	"	"
Pandanus leaves	6 April 1974	Eniaetok	Schoolhouse
" fruit	"	"	"
Surface soil	"	"	"
Coconut fronds	"	"	"
" fruit	"	"	"
Surface soil	"	"	"
Breadfruit leaves	"	"	Ocean to lagoon trail
Surface soil	"	"	"
Scaevola leaves	"	"	"
Messerschmidea leaves	"	"	"
Surface soil	"	"	"
Sediment	"	"	110', lagoon
Coconut crab (2)	"	Busch	Interior

RONGELAP ATOLL (cont)

Sample Type	Collection Date	Island	Location
Coconut crab (3)	7 April 1974	Kabelle	Interior
Tridacna (2)	"	"	Lagoon
Rail (Koak) (2)	"	"	Ocean beach
Coconut frond	"	"	Water catchment
" fruit	"	"	" "
Surface soil	"	"	" "
Pandanus leaves	"	"	Interior
" fruit	"	"	"
Scaevola leaves	"	"	"
Surface soil	"	"	"
Soil profile to 8" (4 samples)	"	"	"
Sediment	"	"	Lagoon (8')
Pig	"	Gabelle	--
Rats	"	Rongelap	Village
Coconut crab (2)	8 April 1974	Arbar	--
Pig	"	Rongelap	Village
Chicken	"	"	"
Water*	April 1974	"	Village - cistern
"	"	"	" - well
Octopus	"	"	Boat landing
Diet samples*	"	"	Village
Algae	8 April 1974	"	Boat landing

* Types or amounts recorded separately by Joe Ash.

BIKINI ATOLL (cont)

Sample Type	Collection Date	Island	Location
Surface soil	13 April 1974	Bikini	Row 24, Center BL to 1st BLN
"	"	"	" 1st BLN to 2nd BLN
"	"	"	Row 38, " "
"	"	"	Row 34, Center BL to 1st BLN
Papaya	14 April	"	House #2
Chicken	"	"	Work camp
Rats	13 April	"	"
Yam	April	"	--

SAMPLE LIST

BIKINI ATOLL

Sample Type	Collection Date	Island	Location
Water	10 April 1974	Bikini	Cistern - Boat landing
Water	12 April	"	Well
Surface soil	10 April	"	Work camp
"	"	"	"
"	"	"	"
Surface soil	11 April	"	Lagoon Road
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
Surface soil	"	"	2nd BLS - Lagoon to ocean
"	"	"	1st BLS "
"	"	"	Center BL "
"	"	"	1st BLN "
"	"	"	2nd BLN "
Coconut frond	"	"	2nd BLS "
"	"	"	1st BLS "
"	"	"	Center BL "
"	"	"	1st BLN
"	"	"	2nd BLN "
Surface soil	"	"	Row 24 - Center BL to BLS
Coconut frond	"	"	" "

BIKINI ATOLL (cont)

Sample Type	Collection Date	Island	Location
Surface soil	11 April 1974	Bikini	1st BLS to 2nd BLS, Row 2
Coconut frond	"	"	"
Surface soil	"	"	Row 34, Center BL to 1st BLS
Coconut frond	"	"	" "
Surface soil	"	"	1st BLS to 2nd BLS, Row 34
Coconut frond	"	"	" "
Soil profile #1 (10 samples)	12 April 1974	"	Center BL - house
Soil profile #2 (9 samples)	"	"	Center BL - Row 24
Soil profile #3 (9 samples)	"	"	1st BLS - Row 24
Pandanus leaves	"	"	House #1
" fruit	"	"	"
Pandanus leaves	"	"	3rd BLN x ocean road
" fruit	"	"	" "
Surface soil	"	"	" "
Coconut fronds	"	"	" Lagoon Road
" fruit	"	"	" "
Messerschmidea leaves	"	"	" "
Surface soil	"	"	" "
Coconut fronds	13 April 1974	"	Row 24, Center BL to 1st BLN
" "	"	"	" 1st BLN to 2nd BLN
" "	"	"	Row 38, "
" "	"	"	Row 34, Center BL to 1st BLN