



.II. FACILITY DESCRIPTION AND HISTORICAL BACKGROUND

A. Cornelia Hill

The CH main and adjacent building consists of several laboratories, offices and service rooms.

Room 6 is the engine room for the air conditioning system. Rooms 7B, 10 and 11 are the janitor's, men's and ladies' rooms, respectively. Room 16 has always been used as a film developing room for the Health and Safety Division. Films developed in this room were prepared and analyzed in rooms 14 and 15. An x-ray machine for film marking was located in room 15.

The Nuclear Accident Dosimetry Counting Systems were installed in room 15 from 1971 until November of 1975 when the NAD System was modified and these counters were no more needed. The system consisted of NaI scintillation counters that were standardized weekly using a Cs-137 source. This is the only source stored and used in this room.

Rooms 1A, 3, 13, 18, 21, 22, 23, 23A and 24 have always been used as offices. Sample preparation and storage were the major activities performed in rooms 1, 2, 4, 5, 7 and 9. In room 1 there are two freezers for sample storage and another one in room 2. From these two rooms, samples were transferred to room 5 for standardization of weight or ashing. There are drying ovens and a muffle furnace in this room. The weighing and the rest of the sample preparation was done in room 4 where the balances were located. In rooms 7 and 9 water demineralizers and distilling units were used, also chemical analysis for nitrates and phosphates were carried out in room 9. Later, room 9 was set aside for phytoplankton culture studies.

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Room 8 was first used as a dark room. It is now used as an office. Room 12 has been used as a trace element analysis room, an Atomic Absorption unit was used here, as was a mercury analyzer and a lipid-fatty acid analyzer. Usually, the samples prepared and acid-digested in the main CEER facilities in Mayaguez, were brought here for analysis.

Room 13 was first set aside as an office, later it was prepared as a reading room. Books and magazines have been stored in rooms 13B and 13C. A cooking stove for the employee's use was installed in room 13A and is still in use.

Room 17 is a large 35' X 35' laboratory used also for sample preparation. Chemical digestions using different acids, have been performed in four hoods located here. There are also three cabinets for reagent storage. Acids for daily use and glassware are stored in the cabinets under the benches. A gas chromatograph and a CHN analyzer are in use in this room.

Almost the same general activities have been performed in rooms 19 and 20.

Acids, liquid reagents, glassware and excess equipment and materials are stored in the two storage rooms. No samples are stored or brought into these rooms.

The shop is a small 4' X 4' room where minor maintenance work is done.

The environmental laboratory and the two walk-in freezers were completed in April of 1977 and to the present time no major work has been initiated there.

B. Water Front Facilities

The dock and the shop-storage building of the Water Front Facilities were constructed in order to protect, maintain and serve the research vessel Palumbo and the other boats used by the Marine Science personnel. Motors and other pieces of equipment and supplies were maintained and stored there.

Even though chemical analysis and other laboratory work was done in the Palumbo, there is no record of any use of radioisotopes in the vessel or in the boats.

In 1976 an aquarium laboratory was constructed. Studies on temperature tolerance in mangrooves and other important marine organisms are the major activities performed here. Also organisms collected in the field are brought here for identification. No radioisotopes have been used here.

III. SUMMARY OF RADIOLOGICAL SURVEY

Even though there is no record or evidence of the use of radioisotopes at Cornelia Hill and Water Front Facilities, a Radiological Survey was made in order to determine if there was any radioactive contamination in the areas.

A walk through survey using Geiger and scintillation survey meters was performed through all the buildings and the surrounding grounds. Smear samples were taken from floors, benches, hoods, instruments and working areas. These smears were analyzed for gross β and α contamination.

It must be pointed out that, since the environmental laboratory and the walk-in freezers were constructed in April of '77 and since no radioactive contamination was found in the other CH facilities, it was not considered necessary to do a survey in these areas. Only equipment and instruments brought in from other buildings were surveyed.

IV. INSTRUMENTS USED

1. Ludlum Geiger Counter - Model 3
Ludlum Measurements, Inc.
Texas
2. Teletector Total 6112
Total Kom - Ges.
Foerstner & Co.
Germany
3. Scintillation Gamma Ratemeter Type 1597A
Reactor Control Division
Eliot Process Automation Limited
Lewisham, London, S.E. 13
4. Nuclear Measurements Corporation Gas Flow
Proportional Counter - Model PCC - IIT - DS-IT Combination
50% efficiency
NMC Indianapolis, Indiana
5. NMC Gas Flow Proportional Counter
Model PC-4
52% efficiency

The survey meters were calibrated using two Radium sources. One of 21.6 mg. and the other 1 mg. Both sources were standardized by the National Bureau of Standards. NBS Certificate Nos. 44532 and 44484.

The counters are periodically checked using Pb-210 and C-14 standard sources.

V. FINDINGS AND CONCLUSIONS

The Radiological Survey demonstrated that all areas at Cornelia Hill and the Water Front Facilities are clean of radioactive contamination.

The walk-through survey showed that radiation levels inside and outside the buildings are between $2\frac{1}{2}\mu\text{R/hr}$ and $4\frac{1}{2}\mu\text{R/hr}$. This is considered the background level of all of the unrestricted areas in Mayaguez. The results of the smear tests also showed background levels.

Figure 3 shows the results of the walk-through survey performed at Cornelia Hill. The survey readings were taken about 20 ft. apart in the grounds within the fence.

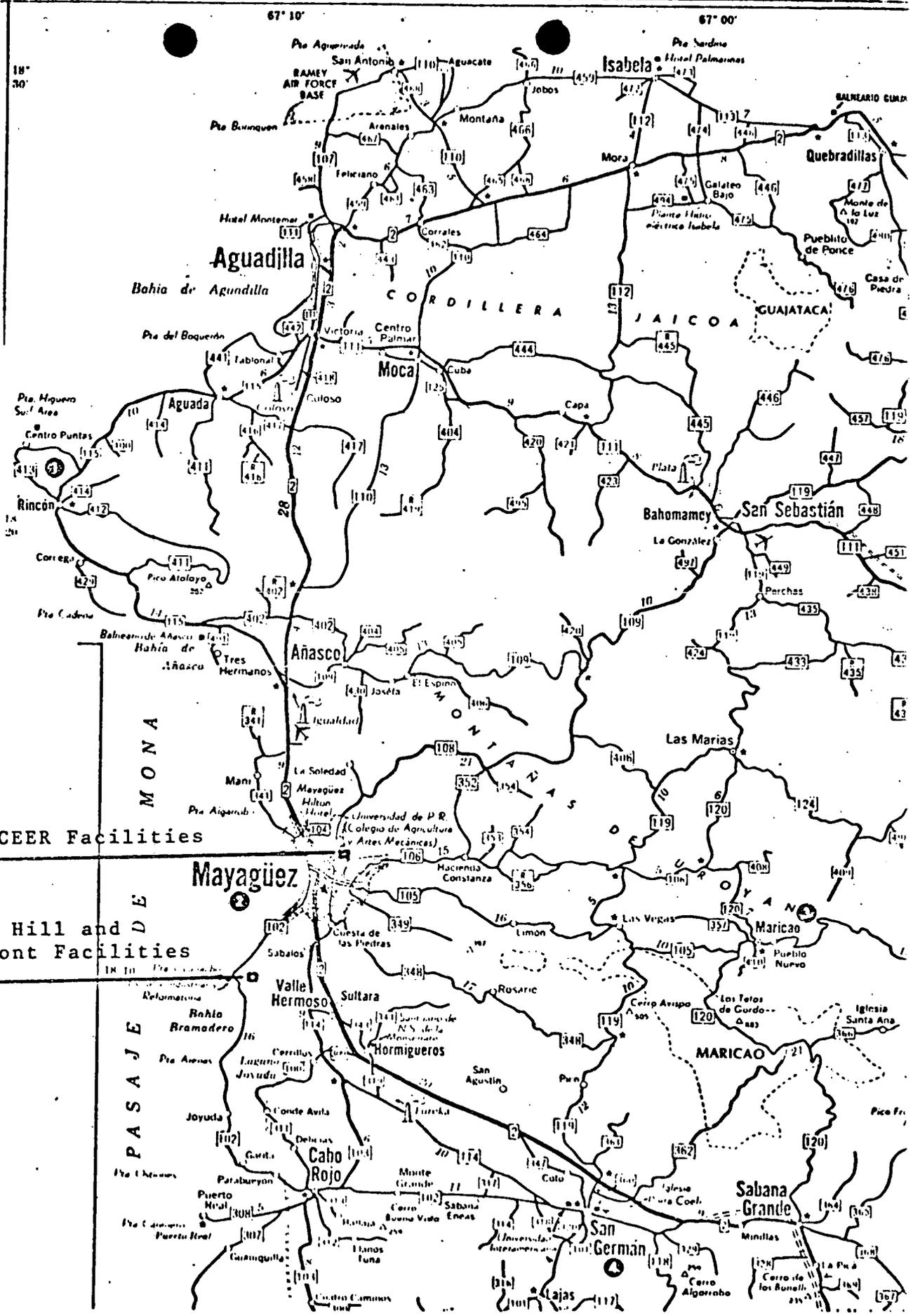
Figure 4 shows the results of the walk-through survey carried out at the Water Front facilities. The same spacing among readings used in CH was used at WF.

Table I is a summary of the results of the Radiological survey.

Table 1. Results of Surveys of Air and Water Front Facilities

Location	Survey Type a) smears b) survey meter	Total # of Smears	Max. removable contamination dpm $\beta\gamma/100 \text{ cm}^2$	Max. radiation level $\mu\text{R/hr.}$
Rm. - 1	a, b	40	0	2
Rm. - 1A	a, b	22	0	3
Rm. - 2	a, b	62	0	2
Rm. - 3	a, b	56	0	3
Rm. - 4	a, b	46	0	3
Rm. - 5	a, b	67	0	3
Rm. - 6	a, b	134	0	2
Rm. - 7	a, b	56	0	3
Rm. - 7A	a, b	18	0	4
Rm. - 8	a, b	50	0	4
Rm. - 9	a, b	209	0	3
Rm. - 10	a, b	146	0	3
Rm. - 11	a, b	92	0	4
Rm. - 12	a, b	224	0	3
Rm. - 13	a, b	95	0	3
Rm. - 13A	a, b	22	0	3
Rm. - 13B	a, b	32	0	2
Rm. - 13C	a, b	14	0	3
Rm. - 14	a, b	362	0	3
Rm. - 15	a, b	37	0	3
Rm. - 16	a, b	25	0	3
Rm. - 17	a, b	1499	0	4
Rm. - 18	a, b	94	0	3
Rm. - 19	a, b	241	0	3
Rm. - 20	a, b	36	0	2
Rm. - 21	a, b	100	0	3
Rm. - 22	a, b	90	0	3
Rm. - 23	a, b	85	0	3
Rm. - 23A	a, b	15	0	3
Rm. - 24	a, b	93	0	2
Corridor A	a, b	114	0	3
Corridor B	a, b	22	0	3
Corridor C	a, b	97	0	3
Emergency Generator	a, b	69	0	4
Small Storage	a, b	228	0	3
Large Storage	a, b	353	0	3
Roof	a, b	17	0	3
New - Lab (equip. Shop)	a, b	117	0	2
	a, b	82	0	2
<u>Water Front Facilities</u>				
Aquarium Lab.	a, b	289	0	3
Shop	a, b	86	0	3
Storage	a, b	100	0	3

Arrows indicate location of Cornelia Hills
Water Front facilities and main CEER
facilities



Main CEER Facilities

Cornelia Hill and
Water Front Facilities

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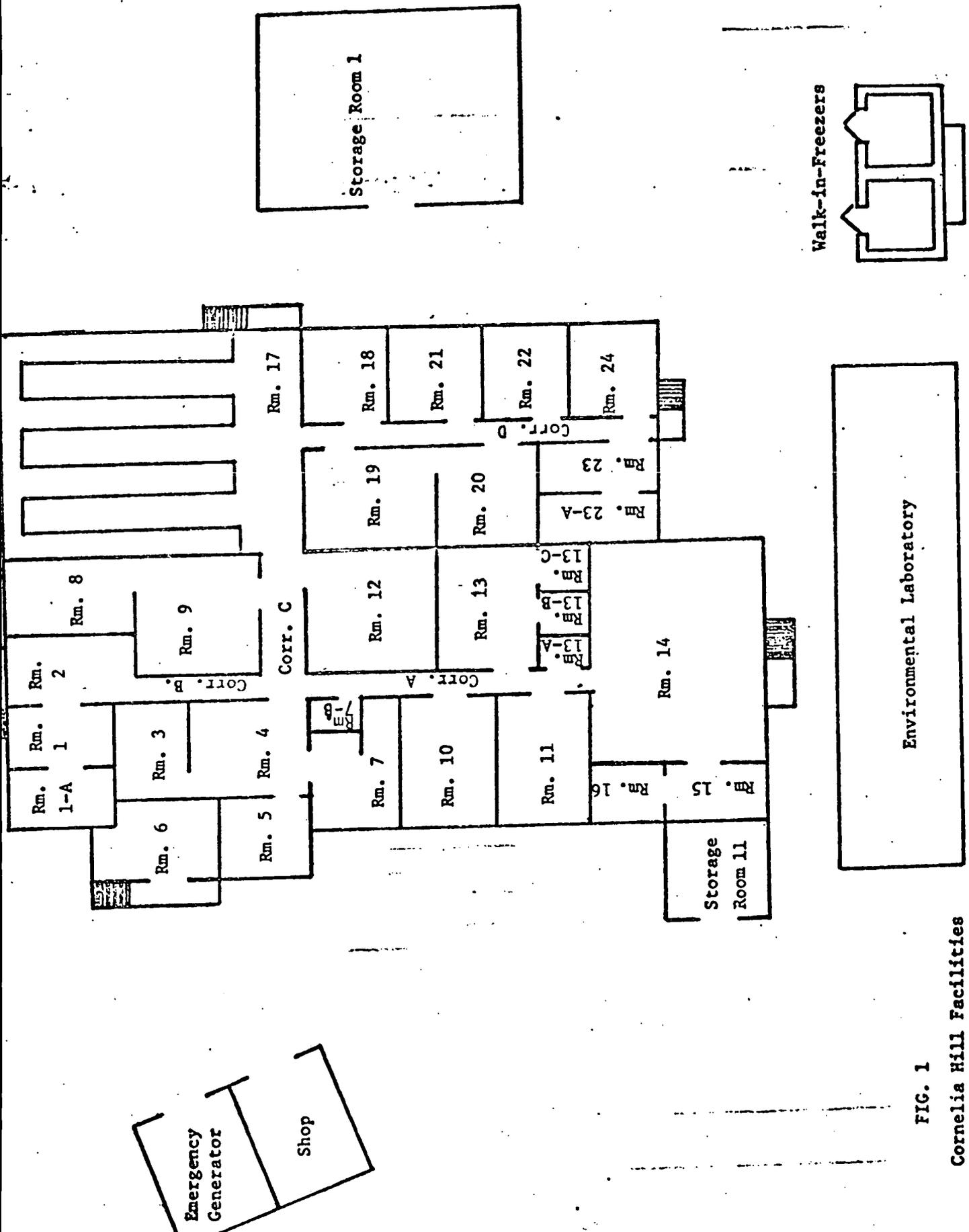
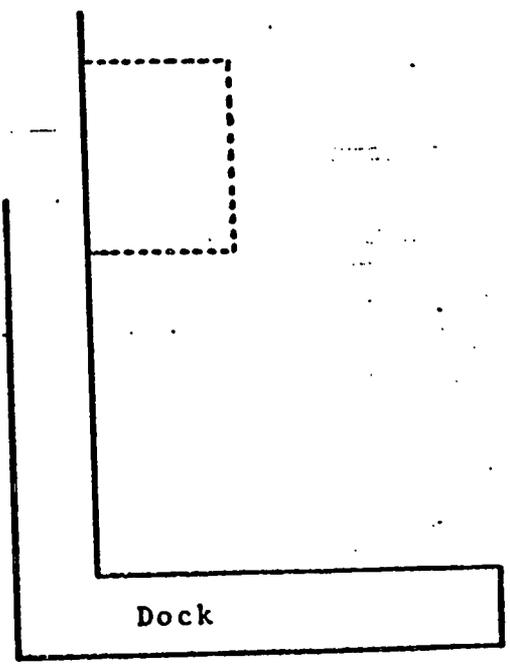
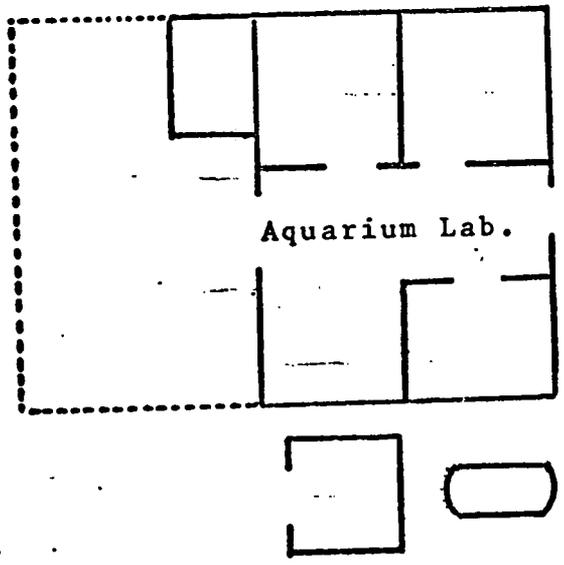
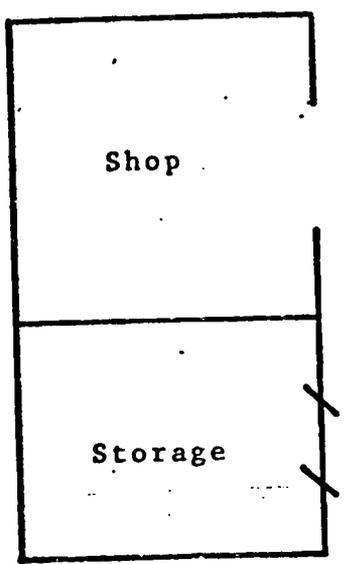


FIG. 1

Cornelia Hill Facilities

Fig. 2. WATER FRONT FACILITIES



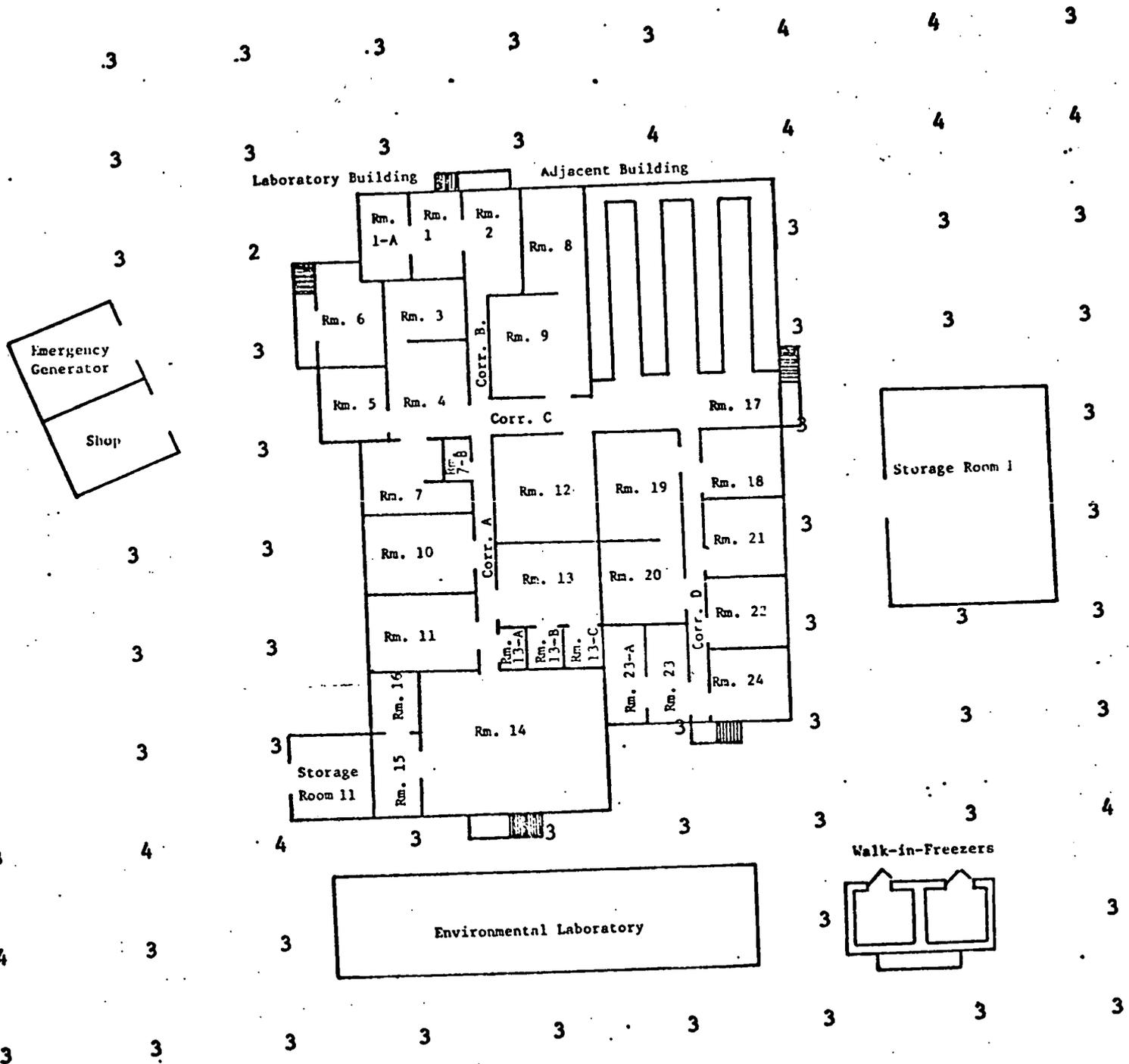


Fig. 3 Results of the walk-through survey at Cornelia Hill facilities expressed in $\mu\text{R/hr}$.

Fig. 4. RESULTS OF THE WALK-THROUGH SURVEY AT THE WATER FRONT FACILITIES EXPRESSED IN $\mu\text{R/hr}$.

