



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

ADMINISTRATIVE  
CORRESPONDENCE

October 1, 1980

The Honorable Don H. Clausen  
United States House of Representatives  
Washington, D.C. 20515

Dear Congressman Clausen:

I am pleased to respond to your July 30, 1980 request for information on the disposal of nuclear waste off the Mendocino coast in Northern California.

The Nuclear Regulatory Commission (NRC) does not have statutory responsibility over ocean disposal. That responsibility today rests with the U.S. Environmental Protection Agency pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972 (P.L. 92-532). Prior to 1972, the Atomic Energy Commission (AEC) had regulatory responsibility over ocean disposal, and during that time the United States carried out ocean disposal of nuclear wastes generated from numerous sources under AEC license and by AEC contractors. Most of the United States ocean disposal activities occurred between 1946 and 1962. Ocean disposal of radioactive wastes was phased down by the United States starting in 1963; our staff believes the last United States' disposals occurred in 1970.

The information contained in this letter and its enclosures is based on the following records: (1) AEC regulatory staff logs based on information supplied by AEC licensees; (2) AEC letter, H. F. Soule to Robert P. Brown dated April 1, 1969, which forwarded tables showing sea disposal operations by the AEC and its licensees; (3) Statement by A. R. Luedecke, AEC General Manager, before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Congress, dated July 29, 1959; (4) EPA Fact Sheet, "Radioactive Waste Dumping Off the Coast of California" dated August 14, 1980; (5) U.S. Coast and Geodetic Survey Charts, numbers 5002 (dated 1960), 5052 (dated 1960), and 8500 (dated 1957); and (6) August 14, 1980 memorandum from Herb Book, NRC Region V to K. Dragonette, Subject: Waste Disposal at Sea by the University of Hawaii, Honolulu, License No. 53-00017-04 (terminated). The NRC staff has not attempted to verify the information contained in these records.

Enclosure 1 lists the locations of the 13 general low-level waste (LLW) sites authorized by the AEC in the Pacific Ocean. It should be noted that the coordinates and nautical miles off United States land points shown in Enclosure 1 are approximate. Five of these sites are located at or within 200 nautical miles of the California coastline. Site P 1 is the Farallon Islands site about 50 miles west of San Francisco, California. Site P 4 is the Santa Cruz Basin site about 35 nautical miles southwest of Port Hueneme, California. Site P 6 is located about 190 nautical miles northwest of the Oregon/California

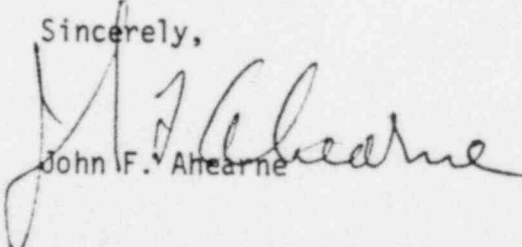
State line at the coast. Site P 7 is located about 35 nautical miles west of the Oregon/California State line at the coast. Site P 10 is located about 200 nautical miles west of San Diego, California. Enclosure 2 contains more specific information on these five sites. Enclosure 3 contains more specific information on the other eight sites. Enclosure 4 contains descriptions of the types of materials and their containers that were disposed of by AEC contractors and licensees. While the AEC regulatory staff logs do not indicate the specific character or isotopic content of the waste, other available data indicate that material disposed of at sea did not include high-level reprocessed radioactive waste from chemical reprocessing plants or irradiated spent fuel assemblies from nuclear reactors.

We do not have sufficient data to estimate the level of activity (curies) remaining in the waste after years of radioactive decay. The logs only present the activity level at the time of packaging for the nuclear material generated by AEC contractors or licensees under the statutory authority of the AEC. It is unknown to NRC whether wastes from naturally occurring and accelerator produced radioactive material (NARM) were included in the containers because the AEC did not have statutory authority over these materials.

The majority of the nuclear disposal activity in the Pacific occurred at Site P 1 (Farallon Islands), approximately 50 miles west of San Francisco. Based on our information, this site contained 98 percent of the radioactivity and 85 percent of the containers disposed of in the Pacific. Most of the radioactivity in the containers at this site was generated by AEC contractors, although the number of containers disposed of by AEC contractors and AEC licensees was approximately equal. The Coast and Geodetic Survey charts indicate that the Farallon Islands site is located in an area labeled "Area Authorized for Disposal of Explosives, Toxic Chemical Ammunition and Radioactive Waste." EPA has performed a number of surveys at this site. The EPA concluded, "Our evaluation of the scientific information that has been obtained from these low level nuclear waste dumpsite surveys at the Farallon Islands indicates no evidence of any harm to either man or the marine environment." This is described on page 6 of an EPA Fact Sheet entitled, "Radioactive Waste Dumping Off The Coast of California" (Enclosure 5). The old AEC license files have been in storage at a federal records center and were not available for preparation of this response. However, the NRC staff has recently obtained copies of these records and is presently reviewing them. We will keep you advised of any further findings. We have not determined from DOE the status of the files on disposal by AEC contractors. In view of the current responsibility of EPA with respect to ocean dumping, as well as the need to look at the issues integrally (without regard to licensee or contractor operations), we suggest that it would be appropriate for any analyses of health and safety concerns to be carried out by EPA. We would, of course, be happy to assist in any way possible.

I trust this information has been helpful.

Sincerely,

  
John F. Ahearne

Enclosures:  
See next page

Enclosures:

1. U.S. AEC Authorized LLW Disposal Sites in Pacific Ocean
2. Specific Ocean Disposal Information on Sites at or Within 200 Miles of California Coast
3. Specific Ocean Disposal Information on Sites Greater than 200 Nautical Miles off the California Coast
4. General Descriptions on Types of Disposed Materials Generated or Licensed by AEC and their Containers
5. EPA Fact Sheet, dtd 8/14/80

cc: Mr. Douglas M. Costle, EPA  
Ms. Ruth Clausen, DOE  
Mr. George W. Cunningham, DOE

U.S. AEC AUTHORIZED LLW DISPOSAL SITES IN PACIFIC OCEAN<sup>1</sup>

<u>AEC Licensed Sites</u>	<u>Central Coordinates (Approximate)</u>	<u>Approximate Nautical Miles Off U.S. Land Points</u>
P 1 (Farallon Islands)	37 <sup>0</sup> 27'N - 123 <sup>0</sup> 37'W	50 Miles W of San Francisco, California
P 2 (Hawaiian Islands)	21 <sup>0</sup> 28'N - 157 <sup>0</sup> 25'W	20 Miles NE of Honolulu, Hawaii
P 3 (Midway Islands)	34 <sup>0</sup> 58'N - 174 <sup>0</sup> 52'W	300 Miles N of Midway Islands
P 4 (Santa Cruz Basin)	33 <sup>0</sup> 40'N - 119 <sup>0</sup> 35'W	35 Miles SW of Port Hueneme, California (Port Hueneme is NW of Los Angeles, California)
P 5	42 <sup>0</sup> 12'N - 129 <sup>0</sup> 31'W	230 Miles W of Oregon/California State Line at Coast
P 6	43 <sup>0</sup> 52'N - 127 <sup>0</sup> 44'W	190 Miles NW of Oregon/California State Line at Coast
P 7	42 <sup>0</sup> 04'N - 125 <sup>0</sup> 01'W	35 miles W of Oregon/California State Line at Coast
P 8	30 <sup>0</sup> 34'N - 139 <sup>0</sup> 05'W	1000 Miles WSW of San Francisco, California
P 9	28 <sup>0</sup> 47'N - 135 <sup>0</sup> 00'W	800 Miles SW of San Francisco, California
P 10	32 <sup>0</sup> 00'N - 121 <sup>0</sup> 30'W	200 Miles W of San Diego, California
P 11	40 <sup>0</sup> 07'N - 135 <sup>0</sup> 24'W	800 Miles WNW of San Francisco, California
P 12	50 <sup>0</sup> 56'N - 136 <sup>0</sup> 03'W	Greater than 350 Miles NW of Cape Flattery, Washington
P 13	52 <sup>0</sup> 25'N - 140 <sup>0</sup> 12'W	Greater than 350 Miles NW of Cape Flattery, Washington

1/Source of Information

1. AEC regulatory staff logs based on information supplied by AEC licensees.
2. AEC letter, H. F. Soule to Robert P. Brown dated April 1, 1969 which forwarded tables showing sea disposal operations by the AEC and its licensees.
3. Statement by A. R. Luedecke, General Manager, U.S. Atomic Energy Commission, before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Congress, dated July 29, 1959.
4. EPA Fact Sheet, "Radioactive Waste Dumping Off the Coast of California" dated August 14, 1980.

SPECIFIC OCEAN DISPOSAL INFORMATION  
ON SITES AT OR WITHIN 200 NAUTICAL MILES  
OF THE CALIFORNIA COAST<sup>1</sup>

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1. Site P 1 - Farallon Islands

The number of containers which were disposed at the site at a depth at or greater than 490 fathoms has been estimated to be 47,500. The radiological activity in the containers at time of packaging has been estimated to be 14,500 curies and consisting of byproduct material, source material, and special nuclear material. The weight of the source material was about 557 pounds and the weight of the special nuclear material was about 1.2 kilograms. The disposals took place from 1946 to 1970. The organizations performing the disposals were Nuclear Engineering Company, Ocean Transport Company, Chevron Research, the U.S. Naval Radiation Development Laboratory, and the AEC. Based on data available, all the containers were disposed within the area bound by the following coordinates:

$37^{\circ} 12'N, 123^{\circ} 19'W; 37^{\circ} 12'N, 123^{\circ} 55'W;$  (Approximate)

$37^{\circ} 41'N, 123^{\circ} 19'W; 37^{\circ} 41'N, 123^{\circ} 55'W;$  (Approximate)

2. Site P 4 - Santa Cruz Basin

The number of containers which were disposed at the site at a depth at or greater than 1000 fathoms has been estimated to be 3114. The radiological activity in the containers at time of packaging has been estimated to be 108 curies and consisting of by product and source material. The weight of the source material was about 13 pounds. The disposals took place from 1946 to 1962. The organizations performing the disposals were Pneumodynamics and the AEC. Based on data available, all the containers were disposed within the area bound by the following coordinates:

$33^{\circ} 30'N, 119^{\circ} 30'W; 33^{\circ} 40'N, 119^{\circ} 45'W;$  (Approximate)

$33^{\circ} 45'N, 119^{\circ} 30'W; 33^{\circ} 50'N, 119^{\circ} 45'W;$  (Approximate)

3. Site P 6

The number of containers which were disposed at the site at a depth at or greater than 1600 fathoms has been estimated to be 4. The radiological activity in the containers at time of packaging has been estimated to be 0.08 curies of byproduct material. The disposal took place in 1960. The organization performing the disposal was Chevron Research. Based on data available, the containers were disposed at the following coordinates:

$43^{\circ} 52'N, 127^{\circ} 44'W$

4. Site P 7

The number of containers which were disposed at the site is 4. AEC regulatory staff sea disposal logs give the depth to be 2240 fathoms; however, coast and geodetic charts indicate the depth to be about 550 fathoms. The radiological activity in the containers at time of packaging has been estimated to be 0.08 Curies of byproduct material. The disposal took place in 1960. The organization performing the disposal was Chevron Research. Based on data available, the containers were disposed at the following coordinates:

42° 04'N, 125° 01'W

5. Site P 10

The number of containers which were disposed at the site at a depth at or greater than 2000 fathoms has been estimated to be 4415. The radiological activity in the containers at time of packaging has been estimated to be 34 curies and consisting of byproduct material, source material, and special nuclear material. The weight of the source material was about 1100 pounds and the weight of the special nuclear material was about 10 grams. The disposals took place in 1960 and 1961. The organizations performing the disposals were Coastwise Marine Disposal Corporation and Isotopes Specialties Company. Based on data available, the containers were disposed at the following coordinates:

32° 00'N, 121° 30'W

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1/ Source of Information

1. AEC regulatory staff logs based on information supplied by AEC licensees.
2. AEC letter, H. F. Soule to Robert P. Brown dated April 1, 1969 which forwarded tables showing sea disposal operations by the AEC and its licensees.
3. Statement by A. R. Luedecke, General Manager, U.S. Atomic Energy Commission, before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Congress, dated July 29, 1959.
4. EPA Fact Sheet, "Radioactive Waste Dumping Off the Coast of California" dated August 14, 1980.
5. U.S. Coast and Geodetic Survey Charts, numbers 5002 (dated 1960), 5052 (dated 1960), and 8500 (dated 1957).

SPECIFIC OCEAN DISPOSAL INFORMATION  
ON SITES GREATER THAN 200 NAUTICAL MILES OF THE  
CALIFORNIA COAST<sup>1</sup>

Site P 2 - Hawaiian Islands

The number of containers which were disposed at the site at a depth at or greater than 1890 fathoms has been estimated to be 39. The radiological activity in the containers at time of packaging has been estimated to be 0.09 curies of byproduct material. The disposals took place in 1959 and 1960. The organization performing the disposals was the University of Hawaii. Based on data available, the containers were disposed at the following coordinates:

21° 28'N, 157° 25'W

It should be noted that according to an August 14, 1980 memorandum from NRC Region V an additional number of disposals took place in the sixties. We do not know the number of containers or the activities at this time.

Site P 3 - Midway Islands

The number of containers which were disposed at the site at a depth at or greater than 3000 fathoms has been estimated to be 7. The radiological activity in the containers at time of packaging has been estimated to be 14 curies of byproduct material. The disposal took place in 1960. The organization performing the disposal was the Military Sea Transportation Service. Based on data available, the containers were disposed at the following coordinates:

34° 58'N, 174° 52'W

Site P 5

The number of containers which were disposed at the site at a depth at or greater than 1800 fathoms has been estimated to be not more than 26. The radiological activity in the containers at time of packaging has been estimated to be not more than 0.95 curies of byproduct material. The disposal took place between 1955 and 1958. The organization performing the disposal was Chevron Research. Based on data available, the containers were disposed at the following coordinates:

42° 12'N, 129° 31'W

Site P 8

The number of containers which were disposed at the site at a depth at or greater than 2000 fathoms has been estimated to be not more than 26. The radiological activity in the containers at time of packaging has been estimated to be not more than 0.95 curies of byproduct material. The disposal took place between 1955 and 1958. The organization performing the disposals was Chevron Research. Based on data available, the containers were disposed at the following coordinates:

30° 25'N, 139° 10'W and 30° 43'N, 139° 00'W

Site P 9

The number of containers which were disposed at the site at a depth at or greater than 1900 fathoms has been estimated to be not more than 29. The radiological activity in the containers at time of packaging has been estimated to be not more than 1.1 curies of byproduct material. The disposals took place between 1955 and 1960. The organization performing the disposals was Chevron Research. Based on data available, the containers were disposed at the following coordinates:

28° 56'N, 134° 42'W and 28° 38'N, 135° 18'W

Site P 11

The number of containers which were disposed at the site at a depth at or greater than 1000 fathoms has been estimated to be 29. The radiological activity in the containers at time of packaging has been estimated to be 0.22 curies of byproduct material and source material. The weight of the source material was one pound. The disposal took place in 1960. The organization performing the disposal was American Mail Line. Based on data available, the containers were disposed at the following coordinates:

40° 07'N, 135° 24'W

Site P 12

The number of containers which were disposed at the site at a depth at or greater than 1800 fathoms has been estimated to be 197. The radiological activity in the containers at time of packaging has been estimated to be 96 curies of byproduct material and source material. The weight of the source material was about 145 pounds. The disposals took place between 1958 and 1966. The organization performing the disposals was American Mail Line. Based on data available, all the containers were disposed within the area bound by the following coordinates:

50° 36'N, 133° 38'W; 50° 50'N, 139° 27'W;

51° 30'N, 136° 31'W (Approximate)



Site P 13

The number of containers which were disposed at the site at a depth at or greater than 1800 fathoms has been estimated to be 163. The radiological activity in the containers at time of packaging has been estimated to be 28 curies of byproduct material and source material. The weight of the source material was about 130 pounds. The disposals took place between 1962 and 1969. The organization performing the disposals was American Mail Line. Based on data available, all the containers were disposal within the area bound by the following coordinates:

51° 46'N, 139° 41'W; 52° 08'N, 141° 09'W;

54° 10'N, 141° 00'W (Approximate)

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1/ Source of Information

1. AEC regulatory staff logs based on information supplied by AEC licensees.
2. AEC letter, H. F. Soule to Robert P. Brown dated April 1, 1969 which forwarded tables showing sea disposal operations by the AEC and its licensees.
3. Statement by A. R. Luedecke, General Manager, U.S. Atomic Energy Commission, before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Congress, dated July 29, 1959.
4. EPA Fact Sheet, "Radioactive Waste Dumping Off the Coast of California" dated August 14, 1980.
5. U.S. Coast and Geodetic Survey Charts, numbers 5002 (dated 1960), 5052 (dated 1960), and 8500 (dated 1957).
6. Memorandum from H. Book, NRC Region V to K. Dragonette, Subject: Waste Disposal at Sea by the University of Hawaii, Honolulu, License No. 53-00017-04 (terminated).

GENERAL DESCRIPTION ON TYPES OF DISPOSED  
MATERIALS GENERATED OR LICENSED BY AEC AND THEIR CONTAINERS

Three types of nuclear materials were disposed under AEC license or by AEC contractors: byproduct, source, and special nuclear material.

Byproduct material which was disposed at that time meant any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material. Source material is (1) uranium or thorium, or any combination thereof, in any physical or chemical form, or (2) ores which contain by weight 1/20 of one percent (0.05%) or more of: (i) uranium, (ii) thorium, or (iii) any combination thereof. Special nuclear material is (i) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission determines to be special nuclear material; or (2) any material artificially enriched by any of the foregoing.

Byproduct material covers a wide range of radionuclides with short (seconds) and long (years) radioactive half-lives; the material exhibits a wide range of specific activity. Source material has very long (millions of years) half-lives; the material exhibits low specific activity. Most special nuclear material has very long (thousands of years) half-lives; most of this material exhibits low specific activity. The exceptions are plutonium-238 and plutonium-241, which have specific activities greater than one curie per gram. The radioactive half-life is time required for a radioactive substance to lose 50 percent of its activity by decay. Each radionuclide has a unique half-life. The specific activity of a radionuclide is the number of curies in a gram of the radionuclide.

The specific radionuclide contents of the containers was not recorded on the logs. It was general practice to package the nuclear material in containers for disposal at sea. The containers were usually 55-gallon drums or concrete boxes. Most of the containers were drums. Concrete was used in the containers to assure that they would sink to the bottom. It was general practice to require disposal in a minimal depth of 1000 fathoms. However, not all disposals occurred at depths greater than 1000 fathoms. According to Mr. Luedecke's Statement before the Special Subcommittee on Radiation of the JCAE, "The radioactive waste itself usually is in the form of contamination on equipment such as test tubes, bottles, rubber gloves, blotting paper, and rubber tubing." The average level of activity per container was in the millicurie range.

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1/Source of Information

1. AEC regulatory staff logs based on information supplied by AEC licensees.
2. AEC letter, H. F. Soule to Robert P. Brown dated April 1, 1969 which forwarded tables showing sea disposal operations by the AEC and its licensees.
3. Statement by A. R. Luedecke, General Manager, U.S. Atomic Energy Commission, before the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Congress dated July 29, 1959.
4. EPA Fact Sheet, "Radioactive Waste Dumping off the Coast of California" dated August 14, 1980.

RADIOACTIVE WASTE DUMPING  
OFF THE COAST OF CALIFORNIA

FACT SHEET

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AUGUST 14, 1980

U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Radiation Programs  
Washington, D.C. 20460

This fact sheet is intended to provide information in response to public concerns about the dumping of radioactive wastes in the Pacific Ocean off the coast of California.

In addition, answers are given to specific questions that have been raised recently to the U.S. Environmental Protection Agency.

## Part I: Background Information

### 1. RESPONSIBILITY FOR DUMPING

o From 1946, when ocean dumping started, until to 1972 all sea disposal of nuclear waste was conducted under the direction and licensing authority of The Atomic Energy Commission (AEC).

o Dumping operations were conducted between 1946-1970. In 1960, however, the AEC declared a moratorium on the issuance of new licenses and between 1962 and 1970 only 350 containers were disposed of.

o In 1970 all ocean dumping of radioactive wastes by the United States was terminated.

o In 1972, PL 92-532, THE MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT gave EPA the responsibility for developing regulations and issuing permits for the future ocean disposal of all waste, including low-level radioactive waste. EPA has not issued permits for dumping any radioactive waste.

o PL 92-532 prohibits ocean disposal of high-level radioactive waste and radiological warfare agents

o On January 11, 1977 EPA issued regulations and criteria for ocean dumping. These regulations specify that:

1. Radioactive materials must be contained to prevent their dispersion into ocean waters, and

2. The containment system must remain intact until the radioactive materials decay to innocuous levels.

### 2. MONITORING RESPONSIBILITY

o PL 95-273, The National Pollution Research and Development and Monitoring Planning Act of 1978, designated the National Oceanic and Atmospheric Administration (NOAA) as the lead agency for monitoring programs and for research and development into ocean pollution.

o EPA and NOAA are currently preparing an interagency agreement to coordinate oceanographic activities for evaluating ocean dumping as an option for future disposal of low-level radioactive waste.

### 3. DUMPING OPERATIONS

o Dumping operations were conducted under AEC licensing authority from 1946-1970. Over 35 sites were designated in the Atlantic and Pacific Oceans, but about 90 percent of the low-level waste containers were dumped in 4 sites:

<u>Major Sites*</u>	<u>Containers**</u>	<u>Curies**</u>
<u>Atlantic</u>		
Atlantic 2,800 meter (9,190 ft.) site at 38°30'N 72°06'W approximately 114 miles off the coast of Delaware;	14,300	41,400
Atlantic 3,800 meter (12,470 ft.) site at 37°50'N 70°35'W approximately 192 miles off the coast of Maryland;	14,500	2,100
<u>Pacific</u>		
Farallon Island 900 meter (2,950 ft.) at site 37°38'N 123°08'W, about 50 miles from San Francisco	3,500	1,100
Farallon Island 1,700 meter (5,575 ft.) site at 37°37'N 123°17'W about 50 miles from San Francisco	44,000	13,400

\*Unofficial listing developed by EPA. Dumping sites were designated and licensed by the Atomic Energy Commission and data on sites, containers and radioactivity would now be with the Nuclear Regulatory Commission, if the records still exist.

\*\*Mostly 55 gallon steel drums containing trace contamination on paper towels, rags, clothing, glassware and laboratory equipment.

\*\*\*Radioactivity at time of dumping. Much of this would be gone now by normal radioactive decay.

o From 1946-1970 a total of approximately 86,750 containers were dumped by the United States with an estimated total activity of 94,670 curies (Ci). Most of these containers were dumped prior to 1962.

o From 1962 to 1970 only 350 containers were dumped with estimated activity of 230Ci.

o The Farallon sites were used from 1946-1965; 47,500 containers were dumped with a total estimated activity of 14,500Ci; 44,000 of these containers were dumped at the 1700 m site.

#### 4. EPA SURVEY OPERATIONS

o From August 1974 to July 1978 EPA conducted six survey operations.

o Survey sites were selected on the basis of the number of containers dumped during period of use.

o Operations were conducted as part of a program for development of regulations pursuant to PL 92-532.

o The survey program was conducted to:

1. Examine the condition of representative containers at each site;
2. Examine the abundance and types of biological organisms;
3. Evaluate releases of radioactivity from containers;
4. Measure current flow through the sites; and,
5. Recover a container for detailed analysis of its condition.

o Three surveys were conducted at the Farallon Islands sites:

1. August 1974 at the 900 m site using the unmanned CURV III (Cable-Controlled Under-water Recovery Vehicle) equipped with cameras, sonar and manipulator arms to collect sediment samples, observe biological activity and condition of containers.
2. August 1975 at the 1700 m site using CURV III to collect sediment samples, deploy current meters, examine condition of drums, and collect biological samples.

3. September-October 1977 at the 900 m and 1700 m sites using PISCES (a manned submersible) to collect sediment, water and biological samples, make current measurements and recover a container from the 900 m site.

o In addition to the Farallon Island sites, three surveys were conducted at the two primary Atlantic dumpsites (2800 m and 3800 m sites).

Part II: Questions Most Frequently Asked About Radioactive Waste Dumpsites Off the California Coast

How Many ocean dumpsites exist off the California Coast?

The Atomic Energy Commission designated six sites acceptable for radioactive wastes off the coast of California. 90-99 percent of the radioactive wastes were dumped at two locations near the Farallon Islands about 50 miles west of San Francisco.

<u>Sites off California Coast*</u>	<u>Containers*</u>	<u>Curies**</u>
Farallon Island 900 meter (2,950ft.) site at 37°38'N 123°08'W, about 50 miles from San Francisco	3,500	1,100
Farallon Island 1,700 meter (5,575 ft.) site at 37°37'N 123°17'W. about 50 miles from San Francisco	44,000	13,400
2,210 m (7,240 ft.) site at 32°00'N 121°30'W about 130 miles SW of Point Arguello or about 215 miles West of San Diego, Calif.	4,400	34
Santa Cruz Basin 1,940 m (6,360 ft.) at 33°39'N 119°28'W about 33 miles southwest of Port Hueneme, Calif.	3,100	108



1,990 m (6,540 ft.) site at 40°07'N 135°24'W about 500 miles west off Cape Mendocino, California	29	No Data
4,570 m (15,000 ft.) site at 30°43'N 139°06'W about 850 miles west of Los Angeles	No Data	No Data

\*Unofficial listing developed by EPA. Dumping sites were designated and licensed by the Atomic Energy Commission and data on sites, containers and radioactivity would now be with the Nuclear Regulatory Commission, if the records still exist.

\*\*Mostly 55 gallon steel drums containing trace contamination on paper towels, rags, clothing, glassware and laboratory equipment.

\*\*\*Radioactivity at time of dumping. Much of this would be gone now by normal radioactive decay.

What was the purpose of EPA's surveys near the Farallon Islands?

EPA's surveys were to evaluate the condition of a few representative drums containing radioactive wastes which had been dumped about 10-30 years before. These evaluations were to provide data for EPA regulations to control any future ocean dumping operations. The data on drum conditions, existence of edible fish, current flows and sediment transport, will help EPA develop criteria for selecting possible future dumpsites, as an option for low-level radioactive waste disposal, and regulations for use of such sites.

EPA has studied only the Farallon Island sites in the Pacific because these sites, having received most of the wastes, gave EPA the best opportunity for locating and evaluating a few representative waste drums.

What reports has EPA published about surveys near the Farallon Islands?

"A survey of the Farallon Islands 500 Fathom Radioactive Waste Disposal Sites - Operations report," U.S.E.P.A. Report No. ORP-75-1, Washington, D. C. (1975). Available from the National Technical Information Service. Order No. PB-286 143/AS A05, price \$8.00, phone: 703-557-4650.

"Environmental Surveys of two deepsea radioactive waste disposal sites using submersibles." Dyer, R.S. in Management of Radioactive Waste from the Nuclear Fuel Cycle, Vol.II, IAEA, Vienna, Austria 1976.

What is the status of the unpublished Farallon Islands reports?

EPA has 16 reports on the Farallon Islands in various stages of completion. Reports are being published in the order in which studies were conducted and analyses completed. These reports are undergoing review by experts outside EPA. Beginning in April 1981 this Agency will issue a series documenting the 1977 surveys.

Is there any danger from past dumping operations?

Our evaluation of the scientific information that has been obtained from these low-level nuclear waste dumpsite surveys at the Farallon Islands indicates no evidence of any harm to either man or the marine environment.

Who is responsible for existing ocean dumpsites?

The use of existing ocean dumpsites was controlled by the Atomic Energy Commission. EPA has responsibility for assessing public health significance of all sources of radiation in the environment.

Is ocean dumping of radioactive wastes legal now?

Yes, the Marine Protection Research and Sanctuaries Act of 1972 allows ocean dumping of low-level radioactive wastes under regulation by EPA. EPA has not issued any permits for such dumping. This agency has a program for determining whether such dumping should be allowed and where. Our current schedule calls for completing necessary studies by late 1985. This program will provide the technical data base to allow for a comparison of various waste disposal options and selection of the best disposal method. EPA will not issue any permits until the necessary studies are done.

Are fish caught near the Farallon dumpsites safe to eat?

Yes, EPA radiation measurements of fish at these sites indicate no measurable activity in edible parts. Only trace amounts of cesium-137 were found in the stomach and skin. These amounts are comparable to those found in fish from other areas due to worldwide radioactive fallout from nuclear weapons testing.

Why not recover radioactive waste drums?

EPA has no evidence that any hazard exists from previously dumped drums of radioactive wastes. These drums on the ocean floor are a long way from any contact with people. On the other hand, if drums are recovered and brought back to land there could be some risk, especially to workers handling and transporting drums in various stages of corrosion. Furthermore, locating and recovering thousands of drums in the deep ocean would be inordinately expensive, and technically infeasible.

What kind of material was dumped at these sites?

Typical low-level wastes disposed of at sea are paper towels, rags, broken glassware, clothing, and other laboratory paraphernalia contaminated with trace amounts of radioactive materials. These wastes were typically compacted in 55 gallon steel drums with concrete caps.