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THE CIBA-GEIGY DISCHARGE PERMIT

FACT SHEET I

GENERAL REQUIREMENTS AND WATER QUALITY REQUIREMENTS

On May 8, 1985, Ciba-Geigy Corporation received a New Jersey Pollutant Discharge Elimination System (NJPDES) permit to discharge treated wastewater or effluent into the Atlantic Ocean, and cooling water, storm runoff, and the backwash from the cooling water intake into the Toms River. The permit took effect on July 1, 1985, and will expire on June 30, 1990.

The permit describes:

- General conditions for all NJPDES discharge permits
- Effluent limitations and monitoring requirements
- Surface water quality requirements for the Toms River and Atlantic Ocean
- Specifications for operation of the wastewater treatment plant
- Toxicity limitations and biomonitoring requirements
- Mutagenicity testing requirements
- Additional requirements for study of ocean outfall impact
- Requirements for annual ocean outfall line performance and maintenance survey
- Requirements for developing and implementing a Best Management Practices Plan
- Conditions for acceptance of outside waste
- Requirements for an off-site monitoring location
- Groundwater decontamination flow monitoring requirements
- Requirements for beach sampling and analysis
- Compliance schedule

The public can review the permit at the New Jersey Department of Environmental Protection (NJDEP) in Trenton.

PERMISSION TO DISCHARGE

Wastewater resulting from production processes is treated to remove pollutants in Ciba-Geigy's wastewater treatment plant. Contaminated groundwater from underneath the Ciba-Geigy site is also treated. The treated water may be discharged by Ciba-Geigy into the Atlantic Ocean.

Discharge monitoring reports must be submitted to the NJDEP, the Regional Administrator, U.S. Environmental Protection Agency (EPA) Region II, and the Ocean County Health Department.

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EFFLUENT LIMITATIONS

POLLUTANT LIMITATIONS

The permit sets specific limitations on pollutant amounts and other characteristics of the effluent. Ciba-Geigy must continuously test (monitor) its treated wastewater to ensure that it is in compliance with the limitations.

1. Any wastes entering the treatment plant must come from Ciba-Geigy. Outside wastes may be brought to the plant only if they are from sites within New Jersey, if they are required for use in the treatment plant, and permission is received in writing from NJDEP.
2. Ciba-Geigy cannot discharge any pollutant more often or at greater amounts than authorized by the permit.

Only those pollutants that are

- Listed on the permit application
or
- Authorized in the permit

can be discharged.

If other pollutants are found in the discharge water, Ciba-Geigy will be in violation of the permit, and the permit may be revoked.

3. Ciba-Geigy must not violate surface Water Quality Standards for the Toms River and the Atlantic Ocean by discharging solids, petroleum hydrocarbons, oils and greases, and toxic or hazardous substances.
4. Pollutants having monitoring requirements and discharge limitations include:

Unspecified EPA-designated priority pollutants (129 pollutants have been designated), and the following specifically named pollutants (some are priority pollutants):

Aluminum	Lead
Benzene	Mercury
Chlorinated Hydrocarbons	Naphthalene
Chlorobenzene	Nickel
Bis (2-Chloroethoxy) Methane	Nitrobenzene
2-Chlorophenol	Organic Carbon
Chromium	Tetrachloroethylene
Copper	Toluene
1,2-Dichlorobenzene	1,2,4-Trichlorobenzene
1,3-Dichlorobenzene	Trichloroethylene
1,4-Dichlorobenzene	Zinc
1,2-Trans-Dichloroethylene	
Ethylbenzene	

The permit states the average and maximum amount of these chemicals that can be discharged per day.

5. There are no discharge limitations on nitrogen-containing compounds, but they must be monitored monthly.
6. Limits have also been placed on the overall toxicity of the ocean discharge. These limits are based on how much the effluent harms the test organisms, mysid shrimp. (See section on reduction of overall toxicity, below.)
7. Any time that new, more stringent Federal or State pollution standards, limitations, or prohibitions are set, the permit must be changed to agree with those more stringent standards.

Reduction of Overall Toxicity

Ciba-Geigy must reduce overall toxicity of its ocean discharge during the next 3 years. The toxicity of the discharge is measured by its effects on mysid shrimp, inch-long saltwater organisms that are very sensitive to pollutants and are used extensively for testing water quality. These tests or bioassays must be performed once a month for the first 3 years and twice a month for 2 years. A certified bioassay laboratory must conduct the tests.

Ciba-Geigy must submit to the NJDEP quarterly reports on progress made in reducing the toxicity of the effluent.

By the spring of 1988, the mysid shrimp must be able to survive for 96 hours in a 50-50 mixture of Ciba-Geigy effluent water and seawater.

Oxygen Levels

The permit limits how much the effluent can change the oxygen levels in both Toms River and the Atlantic ocean. Polluted water affects oxygen levels by encouraging the growth of aerobic (oxygen-using) bacteria. If these bacteria grow in large numbers, they use up the oxygen in the water and leave little for natural animals and plants.

The ability of wastewater to lower oxygen levels is called the Biological Oxygen Demand (BOD). According to the permit, Ciba-Geigy must treat its wastewater to reduce the BOD by at least 85%.

Other Aspects of Wastewater Quality

In addition to pollutant levels, the discharge permit also regulates other aspects of wastewater quality, including water temperature, turbidity (cloudiness), pH (acidity), floating solids, chemicals that color the water, and other characteristics that affect the abilities of water-dwelling plants and animals to survive.

Disposal of Sludge

Any solid materials, including polluted sludge (muddy deposits), that result from the wastewater treatment process must be stored or disposed of according to Federal and State rules for disposing of hazardous wastes.

THE CIBA-GEIGY DISCHARGE PERMIT

FACT SHEET II

MONITORING, EMERGENCY PLANS, AND TREATMENT PLANT OPERATIONS

MONITORING REQUIREMENTS

The permit to discharge treated wastewater contains requirements for regular pollutant monitoring (testing) of the water being discharged (effluent). Requirements include both specific tests for individual pollutants and general tests of water quality. Ciba-Geigy must report any events that might interfere with meeting the permit requirements (noncompliance) within 2 hours of becoming aware of the problem.

The permit requires that an offsite monitoring station be set up to enable the New Jersey Department of Environmental Protection (NJDEP) to verify the accuracy of Ciba-Geigy's monitoring results.

Specific Tests

1. Ciba-Geigy must measure the levels of polluting chemicals and suspended solids in their effluent on a regular basis. Some chemicals, such as lead, zinc, mercury, and toluene must be monitored 1 to 2 times per week. Others, including priority pollutants benzene, naphthalene, and tetrachloroethylene are to be monitored monthly. Floating solids and visible foams cannot be discharged in other than trace amounts.
2. Ciba-Geigy must perform nitrogen scans on groundwater and discharge water. The nitrogen scan measures the discharge levels of several nitrogen-containing compounds. These tests must be done 3 times per year.
3. Ciba-Geigy must test pollutant levels in the bottom sediment in the area around the ocean discharge pipe, once every 4 months for 1 year.
4. Ciba-Geigy must conduct a weekly pollutant check of ocean water at bathing beaches within 1 mile of the ocean discharge pipe during the swimming season from May 15 through September 15. This testing must continue until Ciba-Geigy has reduced the overall toxicity of its discharge so that mysid shrimp can live for 96 hours in a 50-50 effluent-seawater mixture. This program must be approved by NJDEP and the Ocean County Health Department every year before the beaches open.
5. Ciba-Geigy must conduct weekly pollutant tests on local contaminated groundwater that is being pumped into the wastewater treatment plant.

6. Ciba-Geigy must continuously monitor water flow, pH (acidity), and temperature of the effluent.

General Tests

1. Ciba-Geigy must conduct regular bioassay tests on its wastewater discharge. These tests will measure the acute toxicity of the discharge as determined by the wastewater concentration that causes 50 percent of the mysid shrimp to die within 96 hours.
2. Ciba-Geigy must conduct Ames mutagenicity tests on its wastewater discharge every 3 months. These are general tests that are used to screen the discharge for the presence of substances that cause changes in the genetic material of bacteria.

MONITORING OF PIPELINE

Ciba-Geigy must test its ocean discharge pipeline yearly for leaks. This testing includes:

- Pressure testing of the line
- Television inspection of the line
- Visual inspection of the portion of the pipeline underlying Barnegat Bay and the portion underlying the Atlantic Ocean
- Installation and sampling of nearby groundwater monitoring wells
- Sampling of nearby drinking water wells.

OFFSITE MONITORING

Ciba-Geigy must construct a monitoring station outside plant boundaries for sampling discharge from the ocean outfall pipeline. This station will be for the sole use of employees of the NJDEP. It will enable the NJDEP to monitor discharge water without Ciba-Geigy's knowledge. The monitoring station must be in operation within 12 months of the effective date of the permit.

REPORTING OF MONITORING RESULTS

Monitoring results must be sent each month to the

- NJDEP Division of Water Resources
- U.S. Environmental Protection Agency
- Ocean County Health Department

EMERGENCY PLANS

Spills and Leaks

Ciba-Geigy must have a plan to deal with any accidental spilling or leaking of toxic substances that might result from plant activities. This plan is known as a Best Management Practices (BMP) Plan. It must include methods to deal with the following:

- Prevention and containment of leaks and spills of hazardous substances from outdoor storage areas
- Detection of leaks that might occur along the length of the discharge pipes
- Cleanup of accidental spills and leaks of hazardous substances that may occur at loading areas or during transportation on the plant site
- Prevention of leaks from drums and sludge disposal areas.

Upsets

Ciba-Geigy must have an emergency plan to deal with upsets. An upset occurs when there is an accidental increase in discharge water pollution levels. If such an accident results from carelessness on the part of Ciba-Geigy, it can lead to loss of the permit.

OPERATION OF THE WASTEWATER TREATMENT PLANT

Ciba-Geigy must keep its treatment plant in good working order. All equipment in the plant must be inspected on a regular basis. Any faulty equipment must be fixed. The plant must be under the supervision of a certified operator. The treatment procedures must exclude any process that would pose a threat to human health or the environment.

RESPONSIBILITIES OF LOCAL, STATE, AND FEDERAL GOVERNMENT AGENCIES AND
ORGANIZATIONS IN ENFORCING THE DISCHARGE PERMIT

● Local Responsibilities

The Ocean County Health Department

- Receives copies of monitoring reports
- Approves ocean beach monitoring program
- Disseminates information to the public

Ciba-Geigy Advisory and Oversight Committee

- Represents the community concerns about pollution
- Distributes information to the public

Ocean County Citizens

- Inform the NJDEP about pollution problems in Ocean County

● State Responsibilities

The New Jersey Department of Environmental Protection

- Issues the permit for discharge
- Enforces the permit
- Approves monitoring reports
- Approves all monitoring techniques
- Approves all laboratories designated to perform tests
- Approves Best Management Practices Plan
- Samples plant effluent before discharge to check accuracy of Ciba-Geigy reports
- Makes permit and monitoring information available to the public

● Federal Responsibilities

The United States Environmental Protection Agency*

- May inspect treatment facilities and records
- Receives monitoring reports

*In 1982, EPA delegated the Federal permit program to the NJDEP.

Comparison of the Ciba-Geigy 1974
and 1985 Permits to Discharge

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On October 31, 1974, Ciba-Geigy received an EPA permit authorizing the discharge of pollutants to the Toms River and to the Atlantic Ocean via a pipeline. The permit remained in effect until July 1, 1985, when a second, more stringent permit, issued by the State of New Jersey Department of Environmental Protection, became effective. The 1985 permit was initially drafted in September of 1984 and a public hearing was held on it in October. The final permit that was then issued took into account a number of important issues raised at the October meeting. This fact sheet compares the requirements of the old and new permits.

<u>Subject</u>	<u>1974 Permit</u>	<u>1985 Permit</u>
Authorization	From the Regional Administrator of the EPA	From the New Jersey Department of Environmental Protection.
Duty to Comply	- Must not discharge in excess of limitations set in permit	- Must not discharge in excess of limitations set in permit - Must not dilute wastewater instead of treating it - Person who commits violations in implementing permit is subject to fines or imprisonment
Reasons for <u>modification or termination of permit</u>	- Failure to comply - Obtaining permit by misrepresentation of facts - Permit inconsistent with Federal Water Pollution Control Act - Plant activities stop or slow down	- Failure to comply - Obtaining permit by misrepresentation of facts - Permit inconsistent with New Jersey Water Pollution Control Act - Plant activities stop or slow down - Determination that permitted activities endanger human health or the environment - Nonconformance of discharge with areawide plans - Permit inconsistent with State or Federal pollution standards
Facilities	- Must be maintained in good working order - Must notify Regional EPA Administrator and State Agency of non-compliance	- Must be maintained in good working order - Must notify NJDEP of any non-compliance - Kinds of discharges that constitute non-compliance are listed - Must have adequate and well trained staff
Air Emissions from treatment	- Must not exceed levels specified in Federal and State air quality standards	- Not regulated in permit

Comparison of the Ciba-Geigy 1974
and 1985 Permits to Discharge
(continued)

<u>Subject</u>	<u>1974 Permit</u>	<u>1985 Permit</u>
Sludge Disposal	- Sludge disposed of in a manner to prevent entry into navigable water	- Sludge disposed of in a manner to prevent entry into <u>ground and surface water</u> - Sludge must be stored according to Federal and State rules for disposing of hazardous wastes
Emergency Responses	- Must take all reasonable steps to minimize effects of non-compliance - Must maintain an alternate source of power to all waste treatment facilities	- Must take all reasonable steps to minimize effects of non-compliance - Must develop and implement an emergency plan - Must develop a <u>Best Management Practices Plan</u> to deal with accidental spills or leaks
Bypass	- No bypass of treatment plant that would allow entry of wastes into receiving waters	- Bypass permitted if it does not cause effluent limitations to be exceeded and is essential
Limitations on Ocean Discharge	- Limits on 11 parameters	- More stringent limits for 10 parameters (see table 1) - Limits on priority pollutants* - Limits on 18 new parameters (see table 2)
Limitations on storm water runoff and cooling water	- pH and temperature limited	- Limits on 8 new parameters
Limitations on intake backwash	- pH must show no net change from inlet water	- pH between 4.0 - 9.0

*There are 129 EPA priority pollutants.

Comparison of the Ciba-Geigy 1974
and 1985 Permits to Discharge
(continued)

<u>Subject</u>	<u>1974 Permit</u>	<u>1986 Permit</u>
Monitoring requirements	- Weekly monitoring of most parameters - Daily monitoring of pH and temperature	- Twice weekly monitoring of half of the parameters - Monthly monitoring of half of the parameters - Daily monitoring of pH, temperature, and flow
New Tests		- Three tests per year for <u>Nitrogen compounds</u> - Three tests to be made on <u>bottom sediment</u> around <u>discharge pipes</u> - Weekly tests during summer on <u>ocean water</u> at <u>bathing beaches</u> near <u>discharge pipe</u> - Weekly tests on <u>contaminated groundwater</u> near treatment plant - Regular tests on <u>overall toxicity</u> of ocean discharge - Four tests* per year on the <u>mutagenicity</u> of ocean discharge
New requirements		- Must <u>test discharge pipeline</u> yearly for leaks - Must <u>construct an offsite monitoring station</u> for NJDEP to check on Ciba-Geigy monitoring accuracy - Must <u>treat contaminated groundwater</u> from surrounding areas in its treatment plant

*The ability of the discharge to cause changes in the genetic structure of bacteria.

Table 1
Parameters With More Stringent Discharge Limits
in the 1985 Permit

Parameters	<u>Permitted Discharge</u>			
	1974 Permit ^a Average	1985 Permit Average	1974 Permit ^a Maximum	1985 Permit Maximum
BOD5*	2020 sum/3360 win	939	4540 sum/7575 win	2412
Total Suspended Solids	3060	1879	6895	6895
Total Organic Carbon	5535	3475	11,070	6815
Chromium	18	7.1	54	11.1
Copper	16	10.5	45	43.2
Lead	5	1.4	8	3.1
Zinc	16	13.2	36	23.3
Mercury	.5	.23	1.0	.27
Chlorinated Hydrocarbons	70	1.5	140	4.6
Nitrobenzene	7	4.4	36	25.3

^aThese values represent those in the final permit issued by the EPA for the period July 1, 1977, and lasting until December 31, 1980.

*The amount of dissolved oxygen consumed in 5 days by biological processes breaking down organic matter in an effluent.

Table 2

New Parameters Limited in 1985 Permit

Oil & Grease
Toluene
2-Chlorophenol
Bis(2-Chloroethoxy) Methane
Chlorobenzene
Benzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2-Trans-Dichloroethylene
Ethylbenzene
Naphthalene
Tetrachloroethylene
Trichloroethylene
Priority Pollutants*
Nickel

*There are 129 priority pollutants designated by EPA.

OCEAN DISCHARGE: LAWS, STANDARDS, REGULATIONS,
AND JURISDICTIONAL RESPONSIBILITIES

The Ciba-Geigy Corporation in Toms River generates nearly 4 million gallons of liquid waste per day. The waste is treated to meet applicable regulations and standards at an on-site waste water treatment plant before being pumped through a 10-mile pipeline and discharged into the Atlantic Ocean at a depth of 45 feet about one-half mile off shore at Ortley Beach. In addition, contaminated groundwater from underneath the Ciba-Geigy site is also being pumped by purge wells to the wastewater treatment plant.

The citizens of Toms River have raised many questions and voiced numerous concerns about this effluent discharge into the ocean. The questions and answers below relate to the laws, standards, regulations, and jurisdictional responsibilities relevant to the ocean discharge by Ciba-Geigy.

Background

The Clean Water Act is the law passed by Congress to regulate the discharge of non-toxic and toxic pollutants into surface waters. The ultimate goal is to eliminate all discharges and the interim goal is to make all waters in the United States usable for fishing and swimming.

Under the Act, EPA sets effluent guidelines, which are minimum, technology-based levels of required pollution reduction. Using these guidelines, the states issue each individual facility a permit, called a National Pollutant Discharge Elimination System (NPDES) permit, to discharge wastes into the surface waters.

Ciba-Geigy's permit to discharge is a NPDES permit issued by the New Jersey Department of Environmental Protection (NJDEP), in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) regulations. The permit specifies the standards that Ciba-Geigy must meet. The standards include effluent guidelines, which EPA sets and all dischargers must abide by, and effluent limitations, which are control requirements specifically for Ciba-Geigy. Federal regulations must be followed for the issuance of NPDES permits.

Q--Who sets ocean discharge standards?

A--The Federal Clean Water Act (also called the Federal Water Pollution Control Act) regulates the discharge of pollutants into surface waters. Each source of discharge is regulated by an NPDES permit that is issued by the state. The standards specified in the permit are based on EPA's effluent guidelines and the effluent limitations that apply to the particular site (Toxic Substances Control Primer, 1984).

New Jersey state regulations (N.J.A.C. 7:9-5. et seq.) set the requirements for treatment of wastewater discharge into surface waters of the state. Ciba-Geigy must not violate the surface Water Quality Standards for the Toms River and the Atlantic Ocean as found in N.J.A.C. 7:9-4.1 et. seq. as established by NJDEP. These standards are available for public review at the offices of the NJDEP (Water Management Division, EPA).

Q--What standards or regulations exist for wastewater treatment plants?

S--Ciba-Geigy operates its wastewater treatment plant in accordance with the Wastewater Treatment Plant Construct and Operate No. S1A-10-75-2 issued to the Toms River Corporation on March 1, 1976. All industrial wastes that go to the treatment plant must be treated by each of the plant's processes (NJPDES Permit No. J0004120, p. IV-B/C-1).

The specific effluent limitations for Ciba-Geigy's wastewater are listed in the NJPDES permit to discharge pollutants.

Included with that permit are additional requirements of an Industrial Waste Management Facility (N.J. A.C. 7:14A-41 et. seq.). The requirements for compliance with the New Jersey Water Pollution Control Act are established. In addition, the requirements state that "Wastewater treatment units are subject to regulations under Sections 402 or 307(b) of the Federal Act" [The Clean Water Act] (NJPDES Permit No. NJ0004120, p. IV-IWMP-1).

Q--Is Ciba-Geigy in violation of the Clean Water Act?

A--No. The terms and conditions contained in the NJPDES permit and the Administrative Consent Order issued to Ciba-Geigy are written to assure compliance with the Clean Water Act. If Ciba-Geigy continues to meet the terms and conditions, they will be complying with this Act (Water Management Division, EPA).

The permit states that Ciba-Geigy must comply with applicable effluent standards or prohibitions established under the Clean Water Act (P.L. 92-500 et. seq.) and the New Jersey Water Pollution Control Act, even if these requirements have not been incorporated into the permit (NJPDES Permit No. J0004120), p. I-1).

Q--Are chemicals being released into the ocean by Ciba-Geigy that are not permitted? Why did the permit only list 20 of the 129 priority pollutants?

Some chemicals, which are contained in the discharge in very low concentrations, may not be included in the permit. The NPDES permit process regulates pollutants of significance. Pollutants discharged in very small amounts are not normally regulated. However, if the discharger begins to discharge a new pollutant not limited in the permit, they must notify the NJDEP.

To identify and monitor every chemical compound in the discharge would be impractical both for Ciba-Geigy and any Agency checking compliance. According to best professional judgment, certain pollutants along with other measures of pollution are chosen and limited to ensure that the effluent is properly treated and meets all applicable regulations and Water Quality Standards. This approach is spelled out in the NJPDES regulations (N.J.A.C. 7:14 (A)-3.13 (a)(5)). In Ciba-Geigy's case, NJDEP has specified those pollutants that are discharged in the greatest amount and/or may present environmental problems according to existing data. Limitations on toxicity and other effluent characteristics ensure that those chemicals not specifically limited will be treated to an acceptable level. In accordance with national policy, major control on the chemicals discharged is the whole effluent bioassay requirement, and not solely individual chemical parameters. This bioassay requirement determines compliance with a toxicity limit, which is a measure of all pollutants, including those not specifically regulated in the permit (Water Management Division, EPA).

Q--Is discoloring the ocean a violation of the permit?

A--The NJPDES permit contains a requirement that there will be no noticeable color in the water or deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota and none which would render the waters unsuitable for designated uses. This requirement ensures that discharge from Ciba-Geigy does not violate surface Water Quality Standards for the Atlantic Ocean as set forth in the N.J.A.C. (Water Management Division, EPA)

Q--Does the discharge permit regulate nitrogen-containing compounds?

A--The final permit contains a nitrogen scan monitoring requirement for both the groundwater decontamination flow and for the ocean discharge. The nitrogen scan was developed by Rutgers University and measures aromatic nitrogen-containing organic compounds. It can specifically identify N, N-dimethylaniline, aniline, nitrobenzene, 2,4-dichloraniline, isoquinoline, carbazole, 4-azafluorene, 5,6-benzoquinoline, phenanthridine, and acridine (Water Management Division, EPA).

Q--Is Ciba-Geigy using state-of-the-art technology in its wastewater treatment plant?

A--Ciba-Geigy is using and installing treatment technology which will make it possible for them to meet the treatment levels mandated by Congress (Water Management Division, EPA).

OCEAN DISCHARGE: SAFETY

The New Jersey Department of Environmental Protection (NJDEP) has issued to the Ciba-Geigy Corporation of Toms River a permit to discharge treated wastewater into the Atlantic Ocean. The people in the Toms River area have expressed concerns about the large amount of effluent (nearly 4 million gallons per day), the toxic nature of the chemicals used by Ciba-Geigy, and the discharge in the vicinity of beaches. Two basic questions are related to safety:

- (1) Is it safe to eat fish caught in the vicinity of the pipeline?
- (2) Is it safe to swim in the ocean?

Preliminary answers to these questions are provided below. The answers are preliminary because not enough information is yet available to give definitive responses. However, the NJDEP, the Environmental Protection Agency, and the Ocean County Health Department are actively involved in trying to obtain the needed information.

Q--Are fish and shellfish from the ocean contaminated as a result of the Ciba-Geigy discharge?

A--NJDEP has recognized that there may be a problem with the shellfish found in the vicinity of the Ciba-Geigy outfall pipe and has closed a designated area around this pipe to shellfish harvesting. The discharge is not expected to contaminate the ocean fish, as they do not remain in the outfall vicinity (Water Management Division, EPA).

As part of Ciba-Geigy's NJPDES permit, NJDEP is requiring that a series of research studies be conducted on the effluent. The studies are being performed by outside consultants and paid for by Ciba-Geigy. One set of studies, which will be conducted by Rutgers University, will evaluate the potential effects of the effluent on aquatic life. Samples of fish and shellfish found near the outfall will be taken and analyzed to determine whether there are any biological changes in the animals (NJDEP Fact Sheet, June 1986).

In addition, EPA is conducting a study using caged mussels. The mussels will be exposed to the Ciba-Geigy effluent for one month and then analyzed (NJDEP Fact Sheet, June 1986).

Q--Are there any potential health effects from swimming in the ocean near the pipeline?

A--The NJDEP and the various counties in New Jersey regulate ocean swimming in New Jersey. To date, no problems have been identified (Water Management Division, EPA).

As part of the Ciba-Geigy permit, NJDEP required a plume dispersion study to track the effluent after discharge into the ocean. One aspect of this study was a health risk assessment to evaluate the potential toxicity of the effluent. The preliminary health risk assessment was performed by Environ Corporation, approved by the NJDEP Office of Science and Research, and paid for by Ciba-Geigy. On the basis of a series of "worst case" assumptions, including the assumption that a person would swim in the ocean 4 days a week from May 15 to September 15 for 70 years, the conclusion of the risk assessment was that cancer risks posed by swimming near the Ciba-Geigy effluent are extremely low.

The 1986 beach testing program is intended to determine the actual values for some of the assumptions used in the risk assessment. With these actual values for the frequency at which the plume reaches swimming areas and the concentration and toxicity of the effluent, a revised health risk assessment will be done. This assessment is expected to more precisely represent actual conditions (NJDEP Fact Sheet, June 1986).

SUMMER 1986 RESEARCH STUDIES OF THE CIBA-GEIGY EFFLUENT

NJDEP has required that a series of research studies on the Ciba-Geigy effluent be conducted during the summer 1986. The Ocean County Health Department is working closely with NJDEP to oversee the studies. All studies are being conducted by outside consultants. Ciba-Geigy is paying the costs of the studies.

Four types of research projects are being conducted to obtain information needed to assess the potential human health effects associated with exposure to the effluent.

1. Physical oceanography -- To identify climate and ocean conditions that increase the likelihood that the effluent will reach the beaches and determine the frequency of these conditions.
2. Beach monitoring -- To detect the actual instances when the effluent reaches the beaches and to measure the concentration of the effluent.
3. Effluent characterization -- To identify the chemicals in the effluent and identify the most potentially toxic chemicals.
4. Biological effects -- To study the fate of the effluent chemicals in the ocean and determine whether any biological changes are occurring in finfish and molluscs living in or around the effluent.

The NJDEP can provide additional details about the intent, scope, and performance of these studies (NJDEP Fact Sheet, June 1986).