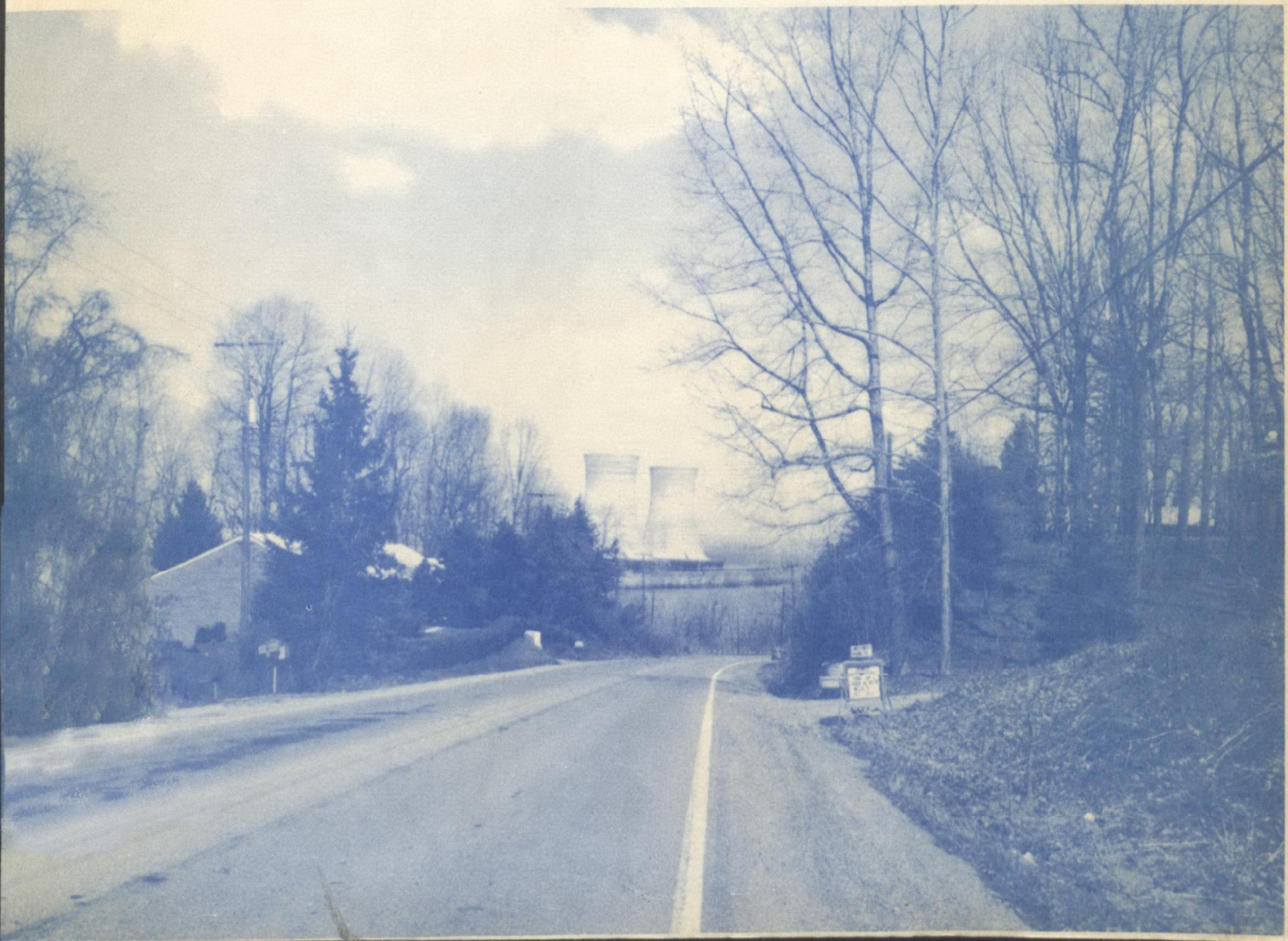


Research and Development

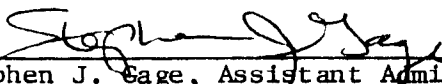


Long-Term Environmental Radiation Surveillance Plan for Three Mile Island




FOREWORD

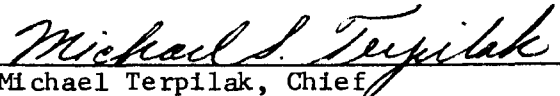
The protection of people and the environment from unnecessary exposure to ionizing radiation from radioactive material which may yet be released from Reactor 2 at Three Mile Island is of utmost importance to the Federal Government as well as to the Commonwealth of Pennsylvania. This surveillance plan is the output of the Federal and state agencies responsible for monitoring near the Reactor. This plan, an update to the plan published September 27, 1979 includes a section addressing additional surveillance activities associated with the proposed venting of krypton-85 from the Containment Building for Reactor 2. It is essential that the involved Federal agencies work closely together to provide the most credible environmental radiation monitoring data. Consequently, the Executive Office of the President has designated the Environmental Protection Agency (EPA) as the lead agency for these monitoring efforts. The technical staffs of the Nuclear Regulatory Commission (NRC), the Department of Health Education and Welfare (HEW), the Department of Energy (DOE), and the Commonwealth of Pennsylvania participated in the preparation of and have concurred with this plan.


Stephen J. Sage, Assistant Administrator
Office of Research and Development
Environmental Protection Agency

This Surveillance Plan, an update to the Surveillance Plan published 27 September 1979, has been jointly developed by the participating Federal and State Agencies. The assigned technical staffs of these agencies have reviewed and concurred with this document.



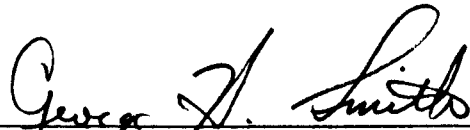
Margaret Reilly, Chief
Division of Environmental Radiation
PA DER, Bureau of Radiation Protection



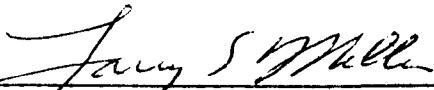
Michael Terpilak, Chief
Standards and Regulations Branch
HEW, PHS, FDA, Bureau of Radiological
Health



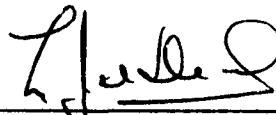
Erich Bretthauer, Director
Nuclear Radiation Assessment Division
EPA



George H. Smith, Chief
Fuel Facility and Material Safety Branch
Region I, Inspection and Enforcement
NRC



Larry S. Miller, Acting Director
Surveillance and Analysis Division
Region III
EPA



Joseph Deal, Chief
Environment Protection Public Safety
Branch
DOE

INTRODUCTION

The Environmental Protection Agency (EPA) has been named by the White House as the lead Federal agency for conducting a comprehensive long-term environmental radiation surveillance program as follow up to the March 28, 1979 accident at Reactor 2 of Three Mile Island (Appendix I). Prior to the implementation of this plan, the Federal agencies have followed the general plan outlined in the White House Memorandum modified occasionally due to the changing condition at the Reactor. EPA has coordinated the efforts between these agencies and the Commonwealth of Pennsylvania.

The public release of data generated by the Federal agencies involved in this program will be through the Environmental Protection Agency (EPA). Data will, however, be provided simultaneously to the other Federal participants and the Bureau of Radiation Protection (BRP) of the Pennsylvania Department of Environmental Resources (DER). This will in no way preclude any agency from fulfilling its statutory responsibility.

The purpose of the surveillance program is fourfold: 1) to provide a measure of the radiological quality of the environment in the vicinity of Three Mile Island nuclear power facility during a period when large quantities of radioactive material will be dealt with at the facility, 2) to provide a basis for informing the public as to the environmental levels of radioactivity, 3) to provide confirmation and feedback regarding the success in control of releases of radioactive material to the environment, and 4) to provide an in-place monitoring program ready for immediate use if an accidental release should occur. This surveillance program is not a substitute for, but is in addition to, the environmental surveillance program conducted by the Metropolitan Edison Company.

Due to the uncertainty of the type and timing of cleanup operations as well as the changing concentrations of radionuclides in containment, there is a need for periodic reassessment of any monitoring plan. This document represents the first revision of the Long Term Environmental Radiation Surveillance Plan For Three Mile Island printed September 27, 1979. The major changes reflected in this revision consist of:

1. The addition of a separate section detailing the monitoring program to be implemented by the Federal Government during the controlled venting of gasses (primarily ^{85}Kr) from the Reactor Containment Building should this venting be approved.
2. For more than nine months, data from the analyses of milk and food have shown no radioactivity attributable to Three Mile Island. In addition the quantity of ^{131}I available in the plant has been reduced to virtually zero by radioactive decay. Based on these data the milk and food sampling program will revert to that routinely conducted by the Commonwealth of Pennsylvania.

In order to develop this plan, careful consideration was given to the type and quantities of radionuclides which were in the Reactor Containment Building, the Auxiliary Building and the Fuel Handling Building. Consideration was also given the licensee's surveillance plan which is closely monitored by the Nuclear Regulatory Commission (Appendix II).

The plan provides for increased surveillance if a release is anticipated, if planned activities increase the potential for a release, or if a release occurs unexpectedly.

Within the Reactor Containment Building there are three compartments of activity: namely the core and primary coolant, water on the floor, and gases and airborne particulates.

The total inventory of ^{85}Kr in the atmosphere of the Reactor Containment Building is estimated at 57,000 curies as of February 12, 1980. All other airborne gaseous and particulate radionuclides are currently reported as less than the minimum detectable level.

The maximum off-site exposure resulting from an accidental release of the ^{85}Kr has been calculated. Given a ground level release of 57,000 curies of ^{85}Kr over a two hour period, with a dispersion factor of $6 \times 10^{-4} \text{ sec/m}^3$ and calculated at a distance of 1 km, the maximum offsite wholebody gamma exposure would be 32 mrem and the maximum beta exposure to the skin would be 2.9 rem. The release of ^{85}Kr in a controlled fashion would be expected to result in a maximum wholebody exposure of 0.2 mrem and a beta exposure of 16 mrem at the site boundary. Using the assumptions contained in NRC Regulatory Guide 1109 for the calculation of doses (namely, an occupancy factor of 70%) a skin dose of 11 mrem would be calculated.

As a basis for comparison the natural background in the Harrisburg-York-Lancaster area is about 88 mrem per year wholebody exposure. The annual natural background in Pittsburgh is 95 mrem, in Denver, Colorado, 165 mrem.

There are approximately 280,000 gallons of contaminated water in the Auxiliary and Fuel Handling Buildings. The concentrations of radionuclides in the water based on sampling conducted through March 7, 1980 are given in Table I.

TABLE I
CONCENTRATIONS OF PRINCIPAL NUCLIDES IN TMI UNIT 2
AUXILIARY BUILDING TANKS TO BE PROCESSED BY
EPICOR-II
uCi/ml

	Reactor Coolant Bleed Tank A	Reactor Coolant Bleed Tank B	Reactor Coolant Bleed Tank C
^3H	0.23	0.27	0.29
^{89}Sr	1.7	*	*
^{90}Sr	0.66	*	*
Cs-134	5.4	6.0	7.7
Cs-137	27	31	35

TABLE I (cont'd.)

CONCENTRATIONS OF PRINCIPAL NUCLIDES IN TMI UNIT 2
AUXILIARY BUILDING TANKS TO BE PROCESSED BY
EPICOR-II
uCi/ml

	Neutralizer Tank A	Neutralizer Tank B	Miscellaneous Waste Holdup Tank
^3H	*	*	0.3
^{85}Kr	*	*	*
^{134}Cs	0.56	0.72	5.9
^{137}Cs	2.5	3.3	32

*Not analyzed as yet. H-3 levels are estimated to be less than 0.2 uCi/ml.

There are approximately 630,000 gallons of contaminated water in the Reactor Containment Building (approximately eight feet deep). The concentrations of radionuclides in this water as of 11/15/79 according to the NRC are shown in Table II.

TABLE II

CONCENTRATIONS OF MAJOR RADIONUCLIDES IN WATER
WITHIN THE REACTOR CONTAINMENT BUILDING *
11/15/79

Radionuclide	Concentration ($\mu\text{Ci/cc}$)	Half-Life
^3H	0.92	12.26 years
^{89}Sr	25	52.7 days
^{90}Sr	4.8	27.7 years
^{134}Cs	27	2.05 years
^{137}Cs	136	30.0 years

*The concentrations of radioisotopes listed in this Table are "best estimates" based upon a limited sampling program. More precise measurements will be made as the decontamination process continues.

A program for cleanup of water in the Auxiliary and Fuel Handling Buildings has been implemented. To date, approximately 150,000 gallons of water have been processed. Based on tritium dilution factors that prevail in the TMI Unit 2 discharge system, this water would meet EPA radiological requirements for drinking water and is suitable for discharge into the Susquehanna River in accordance with NRC regulations.

Plans for treatment of water in the Reactor Containment Building and the Reactor Cooling Water are being developed. These plans will be implemented in late 1980 at the earliest.

There is always an extremely remote possibility that contaminated water in the Auxiliary Building, the Fuel Handling Building, or the Reactor Containment Building could accidentally be released to the Susquehanna River prior to removal of contaminating radionuclides. This plan provides for prompt determination of the extent of any release followed by notification of appropriate authorities responsible for taking protective actions.

The radionuclide concentrations, as provided by NRC, of approximately 85,000 gallons of primary coolant in the Reactor, as of February 11, 1980 are shown in Table III.

TABLE III
CONCENTRATIONS OF MAJOR RADIONUCLIDES IN THE PRIMARY REACTOR COOLANT
02/11/1980

<u>Radionuclide</u>	<u>Concentration (μCi/cc)</u>	<u>Half-Life</u>
^3H	.21	12.26 years
^{85}Kr	.08	10.76 years
^{89}Sr	33	52.7 days
^{90}Sr	27	27.7 years
^{134}Cs	10	2.05 years
^{137}Cs	52	30.0 years

The concentrations of radioisotopes listed in this Table are "best estimates" based upon a limited sampling program. More precise measurements will be made as the decontamination process continues.

SURVEILLANCE PLAN

ROUTINE SURVEILLANCE PROGRAM

The normal or routine surveillance responsibilities of the various Federal agencies are as follows:

Environmental Protection Agency

EPA will operate a network of eighteen continuous air monitoring stations at radial distances ranging from 0.5 miles to 7 miles from TMI. Each station will include an air sampler, a gamma rate recorder and three thermoluminescent dosimeters. A list of sampling locations is shown in Appendix III. The air sampler units sample at approximately 2 cfm and the samples will be collected from each station and analyzed three times per week. All samples are analyzed by gamma spectroscopy at EPA's Harrisburg laboratory using a Ge(Li) detector with a lower limit of detection for ^{131}I , or ^{137}Cs of approximately 25 pCi (0.15 pCi/m³ for a 48 hour sample). Once the radioactive gases have been removed from the Reactor Containment Building, consideration will be given to reducing the number of stations.

Each monitoring station will have a gamma rate recorder for measuring and recording external exposure. Recorder charts will be read on the same schedule used for air sample collection and the charts will be removed weekly for review and storage at EPA's laboratory in Las Vegas, Nevada.

Thermoluminescent dosimeters (TLDs) will be placed at each monitoring station and at 0.25 mile intervals along roads immediately parallel to the Susquehanna River near TMI out to a distance of about 2.5 miles from the Reactor. TLD's will also be placed on the islands located 0.5 to 1.5 miles west of the Reactor site (Shelley, Hill, Henry, Kohr and Beech Islands). These dosimeters will be read on a quarterly basis, with the possible exception of those on the islands which may be inaccessible during the winter. (The Islands are inhabited only during the summer).

Continuous monitoring of the radiological outfall to the Susquehanna River will also be conducted as an alert mechanism to avoid contamination of downstream drinking water supplies. An EPA system which continuously draws water from the outfall and provides a graphic presentation of the count rate (or concentration) in a holding reservoir is operational. The system has a sensitivity of less than 100 pCi/l for ^{131}I or ^{137}Cs for the concentration of the liquid in the counting reservoir. A two stage pumping system is used, with water from the outfall being collected in a sediment trap prior to being pumped to the counting reservoir. At a flow rate of 1.0 l/minute from the outfall to the sediment trap and 0.5 l/minute to the counting reservoir, 90% of equilibrium between the outfall and the counting reservoir will be reached in approximately 17 minutes. Thus an outfall concentration of approximately

1,200 pCi/l of ^{137}Cs will initiate the alarm system in 17 minutes. A concentration of 3,000 pCi/l in the outfall will initiate the alarm in less than 5 minutes. At the present time the alarm level is set at 1,000 pCi/l based on ^{137}Cs as the limiting radionuclide. This corresponds to 1/20 of the maximum permissible concentration as specified in the Code of Federal Regulations, Title 10, Part 20.

Samples will also be collected and analyzed from other TMI outfalls as appropriate. The outfall samples will be gamma scanned in EPA's Harrisburg laboratory where the minimum sensitivity for these samples is about 35 pCi/l for ^{131}I or ^{137}Cs for a 10-minute count. EPA will also analyze Susquehanna River water sampled daily by the Commonwealth of Pennsylvania at the City of Lancaster intake, as well as River water sampled upstream from TMI (City Island). These samples will be analyzed by the EPA Harrisburg laboratory which has a minimum sensitivity for ^{131}I of 10 pCi/l for a 100-minute count. The Commonwealth will then perform ^3H , gross alpha and gross beta analyses on these samples. Strontium 89 and Strontium 90 analyses will be performed on weekly composite samples by EPA. Detection limits for ^{89}Sr and ^{90}Sr are 5 pCi/l and 1 pCi/l, respectively.

Department of Energy

The Department of Energy (DOE) will provide soil and vegetation analyses at seven sites semiannually. In-situ gamma spectrometry analyses will be conducted at these seven plus one additional site. TLDs are also in place at these sites plus four state monitoring locations. If levels of radionuclides demonstrate any increase above background levels, the samples will be subjected to detailed radiochemical analyses.

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) will operate one air sampling station located in the middle of the reactor complex. The air sample will be changed weekly and be analyzed by gamma spectrometry. The NRC will place two sets of TLDs at 59 locations as shown in Appendix V. Each set contains two lithium borate and two calcium sulfate phosphors. The lithium borate phosphor has the ability to detect beta radiation from ^{85}Kr . Both sets will be read on a monthly basis, however, flexibility exists to read one set at more frequent intervals should conditions warrant.

Health Education & Welfare

The Department of Health, Education and Welfare (HEW), Food and Drug Administration (FDA) will defer further monitoring of foodstuffs and milk in favor of a close following of the Commonwealth of Pennsylvania's Department of Environmental Resources (DER) routine surveillance program. FDA may, at its option, split appropriate samples with the Commonwealth for confirmation.

HEW/FDA will, however, be prepared to reinstitute and/or upgrade its former foodstuffs and milk sampling program in the event of an unexpected release from Unit II.

Commonwealth of Pennsylvania

The Department of Environmental Resources of the Commonwealth of Pennsylvania will operate three continuous air sampling stations; one at the Evangelical Press Building in Harrisburg, one at the TMI Observation Building and one in Goldsboro. Each air sample will consist of a particulate filter followed by a charcoal cartridge. The samples will be exchanged weekly, the particulate air samples will be gamma scanned and beta counted for reactor related radionuclides. The particulate air samples will also be composited quarterly and analyzed for ^{89}Sr and ^{90}Sr . The charcoal samples will be gamma scanned for reactor related radionuclides.

The Commonwealth's milk sampling has reverted to it's routine surveillance program, which consists of monthly milk sampling at two dairy farms near the site. The milk samples will be gamma scanned for all reactor related gamma emitting radionuclides.

The Commonwealth will place TLDs at 10 locations shown in Appendix VI. The TLDs will be read monthly.

The Commonwealth will also collect local produce and fish in season. The produce and fish samples will be analyzed by gamma spectroscopy for any reactor related radionuclides.

The Commonwealth also participates with EPA, as previously discussed, to monitor the principal aqueous outfalls of the Reactor.

CONTINGENCY SURVEILLANCE PROCEDURES

Contingency planning for the protection of the public must address the possibility of unplanned releases of airborne radioactivity to the general environment, as well as liquid releases to the Susquehanna River.

In the event of a release of airborne radioactivity in excess of the licensee's Technical Specifications limits, the EPA On-Site Coordinator will be notified by the NRC and an EPA health physics technician may be deployed. Positioning the EPA health physics technician will be the responsibility of the EPA On-Site Coordinator until additional NRC personnel can be summoned to the site from the Regional Office, King of Prussia, Pennsylvania. The NRC health physics personnel would be supported by radiation monitoring equipment and analytical capabilities including the NRC Region I mobile laboratory. Additional NRC personnel would be onsite within two hours; the location of the mobile laboratory at the time of the occurrence would dictate its response time. The Senior NRC Site Representative will assure that the EPA On-Site Coordinator has access to current release data and meteorological information. In addition, the Emergency Coordination Center of the DOE will be notified by the NRC and may be requested to provide aerial measurements and plume tracking. The response time for an aircraft to reach TMI can be expected to be from 2-3 hours under normal conditions with a 6 hour maximum under virtually any condition.

Pennsylvania Department of Environmental Resources (PA DER) Health Physics personnel may also provide monitoring capability as appropriate.

During certain in-plant cleanup operations where an increase in the rate of gaseous releases may be expected, additional survey teams may be deployed to TMI by the EPA, the HEW, the NRC and PA DER. The DOE helicopter may also be on standby in the Harrisburg area for such operations. (These critical points in the cleanup will be identified by the NRC as much in advance as possible.)

Air sampling will serve as a measurement of inhalation exposure as well as an indicator of potential contamination of milk and food crops. Should a prolonged airborne release occur, supplemental air monitoring stations will be established. Ten air samplers will be kept available by EPA for this purpose. EPA will also have three compressed air samplers available for Krypton gas sampling. Apparatus to sample air for subsequent tritium analysis will also be available for prompt deployment by EPA.

Releases of contaminated water that are above the licensee's permitted level for discharge to the Susquehanna River should not occur. The contingency plan for releases above the licensee's permitted level involve prompt confirmation of the released activity by composite sample analysis, followed by notification of the impact of the release to downstream users. Details of the joint EPA-Commonwealth of Pennsylvania plan are described in Appendix VII. In addition to the notification procedures of appropriate Pennsylvania agencies described in Appendix VIII, the EPA TMI Coordinator will notify EPA's Region III Office and EPA's Office of Radiation Programs of the details of the release including anticipated impact to the adjoining states. EPA's Region III Office will then be responsible for notifying adjoining states. This plan does not alter the NRC standard operating procedures for notification of the EPA Regional Office.

A list of phone numbers of individuals responsible for the various monitoring programs at TMI is shown in Appendix VIII.

REPORTING PROCEDURES

There will be two types of data reporting procedures. The first type is designed to distribute information upon which immediate action might be taken and consists of informal reporting methods, while the second procedure is designed to provide a verified data base.

Immediate Reporting Procedures

Each of the monitoring agencies will promptly inform the other monitoring participants of confirmed, positive levels of reactor-related radionuclides through the EPA onsite representative. He will promptly relay the information to the other organizations by telephone or in person to each Federal agency and the Commonwealth of Pennsylvania, followed in either case by written documentation of the event.

Periodic meetings will be called by EPA at TMI to discuss proposed and ongoing operations which could impact the off-site agencies and to exchange information.

Reporting Data into the Data Base

All data will be reported in the format previously specified by EPA. Data from HEW, NRC, DOE and the Commonwealth of Pennsylvania will be submitted to EPA monthly for inclusion in the data base. EPA data will also be placed in the data base monthly.

On a monthly basis, EPA will place data obtained from Metropolitan Edison and the Commonwealth of Pennsylvania, as well as relevant data from other organizations into the data base. EPA will then use computer transfers to transmit monthly updates to the data base to the originating organizations for verification. All data will be verified by the originating organization within 15 days of receipt. Any errors will be referenced by sample number for correction. Periodic updates will be made available to all participants.

REPORTING INFORMATION TO THE MEDIA

The EPA will be the lead Federal agency responsible for distribution of environmental data to the media. Each participant will keep each of the other participants in this plan advised in advance of pending media releases concerning TMI. As appropriate, releases will be coordinated with Metropolitan Edison Company.

QUALITY ASSURANCE

In addition to the internal quality control activities practiced by the Federal agencies and the Commonwealth of Pennsylvania, organizations involved in TMI monitoring will participate in the intercomparison studies listed below. Samples will be prepared and distributed by the Quality Assurance Division of EPA's Environmental Monitoring Systems Laboratory - Las Vegas (EMSL-LV). The intercomparison samples and the schedule for their distribution are as follows.

Milk

Four-liter milk cross check samples containing potassium-40, strontium-89, strontium-90, iodine-131, and cesium-137 will be distributed in January, April, July and October of 1980 to HEW, EPA, NRC, and the Commonwealth of Pennsylvania.

Water

The following cross check water samples will be distributed to HEW, EPA, NRC, and the Commonwealth of Pennsylvania.

Four-liter samples containing a mixture of photon emitting radionuclides (cobalt-60, ruthenium-106, cesium-134, cesium-137, chromium-51, and zinc-65) will be distributed during February, June and October of 1980.

Four-liter samples containing strontium-89 and strontium-90 will be distributed in January, May and September of 1980.

Four-liter samples containing iodine-131 will be distributed in April, August and December of 1980. Fifty-milliliter samples for tritium analysis will be distributed on a bi-monthly basis.

Each participating laboratory is expected to carry out three independent determinations for each radionuclide included in a particular study and to report the results to EPA. Upon receipt of the reports of all participating laboratories, the data will be analyzed. The analysis includes a determination of the laboratory standard deviation, calculations of the normalized range, normalized deviation, sample standard deviation, grand average of all laboratories and warning and control limits.

A report will be distributed by EPA to participating laboratories containing results of each intercomparison study. EPA will immediately notify any participating laboratory as soon as it is determined that the laboratory cross check results exceed the quality assurance deviation level for any given type of analysis.

Special Surveillance During Venting of Reactor Containment Building

Introduction

A proposal has been submitted to the NRC by Metropolitan Edison to vent the containment atmosphere under controlled conditions. Should this proposal be approved the gases would be released through the filtration system so that only ^{85}Kr is released to the environment. Meteorological conditions and flow rate of the vented gases will be balanced so as to give a maximum integrated exposure of 11 mrem beta skin dose at the site boundary.

Surveillance Plans

- I. Environmental Protection Agency - the base long-term program will continue and will be augmented in the following manner:

A monitoring program consisting of survey meter and ion chamber measurements, collection of compressed air samples for ^{85}Kr analysis and intensified collection of samples from routine air monitoring stations will be implemented.

- A. Mobile Monitoring - survey meter and ion-chamber

A minimum of three mobile radiation monitoring personnel equipped with survey instruments and one low range pressurized ion-chamber will be positioned in the predicted downwind trajectory during venting. Monitoring personnel will be drawn from other Federal agencies as well as from the EPA in order to provide 24 hour coverage. In addition to making radiation measurements throughout the day, personnel will be prepared to collect compressed air samples based on those measurements.

- B. Krypton-85 Sampling

Four compressed air sampling units will be positioned at fixed locations for the collection of weekly samples. The units will be placed at Middletown, the Observation Center, Bainbridge and Goldsboro in order to provide representative coverage with emphasis in the predominate wind directions. Sampling will be conducted for one to two weeks prior to venting to provide background data for the TMI area. Samples routinely collected in Nevada will provide an indication of worldwide ambient ^{85}Kr levels for comparative purposes. In addition three compressed air sampling units will be deployed with the mobile monitors. A minimum of one sample will be collected each day (at the predicted offsite location of maximum plume concentration). Additional samples will be collected, when necessary, based upon survey meter and ion-chamber data. All samples will be analyzed at the EPA laboratory facilities in Harrisburg.

C. Tritium Monitoring

One molecular sieve sampler will be operated at the Observation Center for collection of atmospheric moisture for tritium analysis. Analyses will be performed at the EPA laboratory facility in Harrisburg.

D. Routine Air Monitoring Network

In order to verify that no radionuclides other than ^{85}Kr are released to the environment during each venting, samples from the established network of eighteen operating stations will continue to be collected. Samples in the downwind sector will be collected every day, rather than the three times per week under normal conditions. In addition at least one sample from "control" stations in each quadrant not in the downwind trajectory will be collected and analyzed on a daily basis.

Discussion

The EPA surveillance plan will rely on survey meter and ion-chamber data to assure that concentrations of ^{85}Kr in excess of those prescribed by the Code of Federal Regulations, Title 10, Part 20 for release to an uncontrolled area are not being exceeded. Calculations suggest that the monitoring instrumentation will be sensitive to concentrations approximately 1/10 of the MPC. Data from the air surveillance network will document low level ($<0.2 \text{ pCi/m}^3$) releases of other radionuclides, should any such releases occur. The compressed air samples will have a sensitivity of approximately 5 pCi/m^3 , however the turn-around time precludes their use as "real time" monitors. They will, however, provide documentation of any extremely low concentrations of ^{85}Kr in the offsite area.

WASHINGTON

April 13, 1979

MEMORANDUM FOR THE HONORABLE JOSEPH CALIFANO
THE HONORABLE JAMES SCHLESINGER
THE HONORABLE DOUGLAS COSTLE

FROM: JACK WATSON

SUBJECT: Long-Term Environmental Radiation
Monitoring at Three Mile Island

It is clear that several Federal agencies must continue to play a key role in assuring the citizens around the Three Mile Island site of their safety during the final stages of the plant's shutdown and initiation of cleanup. It is essential that the involved Federal agencies work closely together to provide the most credible environmental radiation monitoring data. Consequently, pursuant to the President's direction that I coordinate the assistance efforts of all Federal agencies for the Three Mile Island accident, I am hereby designating the Environmental Protection Agency as the lead agency for these monitoring efforts. In addition, I am asking each of the agencies named below to continue to meet the responsibilities indicated and to provide adequate resources for those tasks.

Environmental Protection Agency

As the lead agency, EPA should assume responsibility for coordinating the collection and documentation of the environmental radiation data obtained by all of the Federal agencies involved since the accident occurred on March 28, 1979. The EPA should continue to maintain an operations center staffed with radiation specialists in the vicinity of Three Mile Island to coordinate data collection and to inform the public, through the Nuclear Regulatory Commission, of off-site radiation levels. The information and data collected by EPA should be made available to the other participating agencies on a regular basis. The EPA should also continue to operate, at an adequate level, its environmental monitoring network for air and water-borne radioactivity. Finally, the EPA should prepare a report of such environmental radioactivity for the recently established Presidential Commission to investigate the accident.

Health, Education, and Welfare

The Food and Drug Administration should continue to conduct radioanalyses of milk and food in the vicinity of Three Mile Island at appropriate intervals. These, and all previous analyses, should be promptly submitted to the operations center. Other environmental data collected by FDA, such as dosimeter readings, should also be included in the combined Federal report.

The Center for Disease Control and the National Institute of Occupational Safety and Health should keep the EPA operations center informed of their activities, either at the reactor site or off-site. Any environmental data gathered by CDC or NIOSH should be submitted to the operations center for inclusion in the report.

Department of Energy

The Department of Energy should continue to sample and conduct radioanalyses of soil and vegetation in the vicinity of Three Mile Island at appropriate intervals. These, and all previous analyses, should be promptly submitted to the operations center. Other environmental data collected by DOE, or its contractors, such as radiation intensity measurements from helicopter flights and dosimeter readings, should also be included in the combined Federal report. The Department should also continue to provide meteorological support at the operations center, as needed.

The Environmental Protection Agency should make every effort to obtain all pertinent environmental radiation data from the Nuclear Regulatory Commission, the State of Pennsylvania, and the utility.

* * *

I am very pleased with the reports I have received of the excellent cooperation among the Federal agencies assisting in the Harrisburg area. I am confident that this spirit of cooperation will continue, and that all of the participants will maintain their vigilance until the risks of radiation releases are reduced to a minimum.

If you have any questions on these assignments, please call me or Gene Eidenberg (456-6537).

cc: Chairman Joseph Hendrie,
Nuclear Regulatory Commission

APPENDIX II

METROPOLITAN EDISON TMI LONG-TERM MONITORING PROGRAM

The Metropolitan Edison (Met-Ed) Monitoring Program, is a combination of the TMI-1 and TMI-2 Environmental Technical Specification required programs and increased monitoring activities which were initiated after March 28, 1979.

The monitoring program is subject to change based upon review of the results and requests for additional monitoring. In no instance will the program be reduced to less than that required by the Environmental Technical Specifications. All major reductions in scope or intensity will be discussed with the NRC and the Commonwealth of Pennsylvania prior to implementation.

All air, water, and milk sampling locations refer to a location code which denotes location as a function of azimuth and distance from the reactor. The location code is shown as Table 1.

Air Sampler Network

<u>Location</u>	<u>Location Code</u>
North Weather Station	1F2
Falmouth Substation	8C1
Observation Center	5A1
West Fairview	15G1
Drager Farm	7F1
Middletown	1C1
Goldsboro Air Station	12B1
North York Substation	9G1

Sampling Frequency - weekly

Analysis:

Air particulate - Gross Beta

Gamma Spec. - if Gross Beta exceeds alert level

Quarterly composite - $^{89-90}\text{Sr}$, Gross Alpha, Gamma Spec.
of air particulate

Charcoal Cartridge - radioiodine

APPENDIX II (Continued)

Milk Network

<u>Location</u>	<u>Location Code</u>
Alwine Farm	4B1
Becker Farm	7B3
Fishing Farm	14D1
Cellig Farm	2G1
Hardison Farm	1B1

Sampling Frequency - weekly

Analysis - radiiodine (chem. spe.)
gamma spec.

$^{89-90}\text{Sr}$ (quarterly composite)

Water Sampling Network

<u>Location</u>	<u>Met-Ed Location Code</u>
Swatara Creek (raw grab)	1C3
Brunner Island (raw and finished composite)	8E1**
Columbia Water Plant (raw and finished composites)	7G1**
Steelton Water Works (raw composite)	15F1**
York Haven Generating Station (raw composite)	8C2
York (finished composite)	9G2
Wrightsville (finished composite)	7G2
Lancaster (finished composite)	7G3

Sampling Frequency - daily

The daily samples taken at each of the above stations are composited weekly and analyzed for:

Tritium, Gamma Spec., and Gross Beta.

In addition, $^{89-90}\text{Sr}$ analyses are performed on quarterly composites of 15F1, 8C2, 8E1, and 7G1.

APPENDIX II (Continued)

Daily water samples are also collected from the 001 discharge and analyzed as follows:

<u>Location</u>	<u>Met-Ed Location Code</u>
001 discharge (composite)	10S1

Analysis - radioiodine (ion-exchange separation)
gross beta
tritium

Additional Samples

Fish, aquatic plants, aquatic sediments are sampled periodically as well as miscellaneous food products as they become available.

TLD Network

<u>Location</u>	<u>Met-Ed Location Code</u>
North Weather Station	1S2
North Bridge	2S2
Top of Dike	4S2
Top of Dike	5S2
Falmouth-Collins Substation	8C1
South TMI	9S2
Mechanical Draft Cooling Tower	11S1
North Boat Dock	16S1
Shelly Island	14S2
Laurel Road	4A1
Observation Center	5A1
Kohr Island	16A1
S. End Shelly Island	10B1
Goldsboro Air Station	12B1
Middletown Substation	1C1
Drager Farm	2F1
Route 241	4G1
North York Substation	9G1
W. Fairview	15G1
Columbia	7G1

Changeout - monthly

TABLE I

Distance & Azimuth Of Sampling Locations
For The Three Mile Island Nuclear Station
Offsite Emergency Radiological Environmental Monitoring
Program

<u>Location</u>	<u>Distance (miles)</u>	<u>Azimuth</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Azimuth</u>
1S2	0.4	0°	1C1	2.6	0°
2S2	0.7	25°	1C3	2.3	350°
4S2	0.3	71°	8C1	2.3	159°
5S2	0.2	95°	8C2	2.3	165°
9S2	0.4	184°	14C1	2.7	285°
10S1	0.8	200°	14C3	2.7	285°
11S1	0.1	221°			
14S2	0.4	293°	14D1	3.5	294°
16S1	0.2	340°			
			4E1	4.4	75°
1A2	0.7	0°	8E1	4.1	160°
4A1	0.5	65°	8E1	4.1	160°
5A1	0.4	86°			
7A1	0.3	137°	7F1	9.0	132°
7A2	0.5	137°	15F1	8.7	308°
9A2*	0.5-1.0	185°-191°			
9A2	0.5	188°	2G1	10.5	32°
10A1	0.8	202°	4G1	10	68°
10A3*	0.2-1.0	191°-213°	5G1	10.6	97°
11A1	0.5	225°	5G2	10.6	97°
13A1*	0.7-1.0	258°-281°	6G1	10.5	120°
16A1	0.4	332°	7G1	15	124°
16A2*	0.2-1.0	326°-348°	7G2	15	128°
			7G3	15.1	124°
1B1	1.2	5°	9G1	13	183°
4B1	1.1	65°	9G2	15	184°
5B1	1.0	92°	15G1	15	308°
6B1	1.5	118°			
7B1	1.1	141°	Ind*	0.2-2.0	270°-90°
7B3	1.6	140°	Ctrl*	0.2-2.0	90°-270°
9B1*	1.0-2.0	172°-194°			
9B1	1.5	183°			
9B2*	1.0-2.0	185°-194°			
9B3*	1.0-2.0	185°-194°			
10B1	1.1	204°			
12B1	1.6	253°			
16B1*	1.0-2.0	326°-348°			
16B8*	1.0-2.0	326°-348°			

*Locations so noted are part of the fish sampling program and since electrofishing is the primary collection technique, that entire area is generally fished.

APPENDIX III

THREE MILE ISLAND EPA LONG-TERM SURVEILLANCE STATIONS

Air Samplers, Gamma Rate Recorders, TLDS

<u>STATION</u>	<u>AZ</u>	<u>DIST.</u>	<u>ASSOCIATED TOWN</u>
3	325	3.5	Meade Heights, PA -- Harrisburg International Airport
4	360	3.0	*Middletown, PA -- Elwoods' Sunoco Station
5	040	2.6	Royaltown, PA -- Londonderry Township Building
9	100	3.0	Newville, PA -- Brooks Farm (Earl Nissley Residence)
11	130	2.9	Falmouth, PA -- Charles Brooks Residence
13	150	3.0	Falmouth, PA -- Dick Libhart Residence
*14	145	5.3	*Bainbridge, PA -- Bainbridge Fire Company
16	180	7.0	*Manchester, PA -- Manchester Fire Department
17	180	3.0	*York Haven, PA -- York Haven Fire Station
20	205	2.5	Woodside, PA -- Zane Reeser Residence
21	250	4.0	*Newberrytown, PA -- Exxon Kwick Service Station
23	265	2.9	Goldsboro, PA -- Mueller Residence
31	270	1.5	*Goldsboro, PA -- Dusty Miller Residence
34	305	2.7	Plainfield, PA -- Polites Residence
35	068	3.5	Royaltown, PA -- George Hershberger Residence
36	095	0.5	TMI Observation Center
37	025	0.7	North Gate, TMI
38	175	0.8	South Gate, TMI

*Sampling stations located in indicated town. Other sampling stations are located near indicated towns.

APPENDIX IV

EPA STANDBY
MILK SAMPLING LOCATIONS

Azimuth and Distance from Reactor		
AZ (Degrees)	Dist. (Miles)	Dairy Name
355	6.0	A.W. Hoffer Dairy
105	3.2	David Miller Dairy
160	6.4	Leroy Herzler Dairy
296	6.8	Beshore Farms Dairy

APPENDIX V

DESCRIPTION OF NRC TLD LOCATIONS

- E1 - Hwy. 441 on Laurel Road 1st telephone pole on right outside vendor TLD box. 90° 0.45 mi
- NE1 - On telephone pole by George Beyer Market, Geyers Church Road off 441. 25° 0.8 mi
- NE2 - On telephone pole at intersection of Hillsdale and next road on left from Geyers Church Road (closed road to gold church) by yellowish red house. 19° 1.9 mi
- N1 - On chain link fence for power substation, Middletown SE corner. 358° 2.6 mi
- NE3 - On telephone pole on Rt. 230 directly across from Shady Lane Motel. 15° 3.05 mi
- NE4 - On telephone pole on Rt. 743 just north of Texaco station, just north of Turnpike underpass. 55° 6.5 mi
- N2 - On telephone pole on Middletown Road N of Rt. 283, directly across the street from childrens care center.
- N3 - On sign pole on Middletown Road at intersection to Rt. 322 E. Signpole says 322 West. 0° 7.0 mi
- N4 - On telephone pole on Hoe Road, just N. of intersection of Union Deposit Road. 2nd pole on left. 0° 9.0 mi
- N5 - On telephone pole on Rt. 39 at intersection of Rt. 22 (Allentown Rd.) 0° 13 mi
- NW5 - Environmental Station (Met Ed) at West Fairview, rear to Annex Building Fairview Fire Department, adjacent to tracks. 305° 15 mi
- NW4 - On telephone pole on Meadowbrook just off Bridge Street, one block on N. side from Bridge Street. 300° 8.6 mi
- NW3 - On telephone pole on Old York Road. 1st pole over turnpike overpass, west side. 295° 7.4 mi

Appendix V (Continued)

TLD Locations

- NW2 - On telephone pole on Marsh Road by Culvert under RR tracks off Old York Road. 300° 5.9 mi
- NW1 - On telephone pole directly in front of church at intersection of Rt. 262 E and Rt. 392 W (Valley Road and Yocumtown Road). 305° 2.6 mi
- W1 - On "No Parking Any Time" sign within 18' of water at old boat ramp at Goldsboro. 264° 1.25 mi
- W2 - On constant monitor inside chain link fence to Monitoring Station, Goldsboro on Rt. 262. By stream. 252° 1.3 mi
- SW1 - On telephone pole approximately 25' from tracks in turn around full of flattened beer cans. Across from 2 small trailers (green and blue) in clearing (N end). 200° 2.1 mi
- W3 - On telephone pole on Pines Road at intersection of 974 Red Mill Road. near Newberry. 264° 2.9 mi.
- W5 - On telephone pole at intersection of Rt. 382 and Rt. 177 NW corner Lewisburg. 259° 7.3 mi.
- W4 - On telephone pole on Rt. 392 (Pathshill Road) just beyond Ridge Road on S. side. Beyond sharp bend. 266° 5.9 mi
- SW2 - On telephone pole at intersection of 382 E and 295. Diagonally across from Texaco station, York Haven Road and Reeders Hill Rd. Pleasant Grove. 203° 2.5 mi
- S-1 - On telephone pole at intersection of Rt. 181 and 382. Across street from York Haven Office. In front of Catholic church, York Haven. 168° 3.15 mi
- S-2 - On telephone pole at intersection of Meeting House Road and N. George Street (Rt. 181 S), Manchester. 175° 5.1 mi
- S-3 - On telephone pole on Rt. 238 at intersection to Rt. 181 S. By old brick and cement block building, Emigsville. 180° 9.1 mi

Appendix V (Continued)

TLD Locations

SW3 - On telephone pole at intersection of Lewisberry Road and Butter Road. By small frame house near Anderson town.	210°	8.1 mi
SW4 - On telephone pole at intersection of Butter Road and Bull Road	215°	10.1 mi
S-4 - York substation, sampling enclosure.	180°	12 mi
SE5 - On telephone pole at intersection of 441 N and Vinogary Ferry Road across entrance to Cargill Truck entrance.		
SE4 - On pole at intersection of 441 N and 241 N. Pole next to fruit stand.	141°	4.6 mi
SE3 - On chain link fence on right side by Collins Substation sign at intersection of 441 and Falmouth Road.	160°	2.25 mi
SE2 - On telephone pole at intersection of 441 N and Turnpike Road.	162°	1.85 mi
SE1 - On telephone pole across from Red Hill Farm fruit stand 441 N, 1 mile from 3 Mile Island.	150°	1 mi
E2 - On telephone pole at Hillsdale Road and Turnpike Road.	110°	2.7 mi
E3 - On telephone pole at Turnpike Road and Bossler Road.	101°	3.7 mi
E4 - On telephone pole at intersection of W Hight Street and Mosorie Road, Elizabethtown.	90°	7.0 mi
E5 - Meadow Lane, 1st house on south side of street.	86°	0.4 mi
N - Rte 441	03°	1.8 mi
NE - Under TMI high tension lines	44°	1.1 mi
ENE - Rte. 230	64°	3.8 mi
SE - Rte. 411	130°	0.5 mi
SSW - Beech Island	203°	0.7 mi

Appendix V (Continued)

SW - Newberry Township	227°	1.8 mi
NNW - Shelly Island	289°	0.3 mi
WNW - Town of Plainfield	301°	1.3 mi
NW - Hill Island	316°	1.2 mi
NW - Highspire	326°	5 mi
NNW - Kohr Island	332°	0.5 mi

NRC - TLD SCHOOL LOCATIONS

N1a	NORTHUMBERLAND SCHOOL 2.4 mi N
N1b	MANSBERGER SCHOOL 2.7 mi NNW
N1c	FEASER SCHOOL 3 mi N
N1d	CAPITOL CAMPUS, PENN STATE U. 3.5 mi NW
N1e	GRANDVIEW SCHOOL 3.5 mi NNW
N1f	MIDDLETOWN HIGH SCHOOL 4 mi NNW
NE-3a	TOWNSHIP SCHOOL 3.6 mi NE
W-3a	NEWBERRY SCHOOL 4.4 mi W
S-1a	YORK HAVEN-NEWBURG SCHOOL 3.3 mi S
SE-4a	BAINBRIDGE SCHOOL 5.0 mi SE

APPENDIX VI

THREE MILE ISLAND POWER PLANT SAMPLING LOCATIONS

TLD Stations (Frequency - monthly)

Location	Azimuth and Distance from Reactor	
	Azimuth (Degrees)	Distance (Miles)
TOMT ₁ Middletown, Met. Ed. Mill St. substation	358	2.6
TOMT ₂ TMI Observation Building	90	0.5
TOMT ₃ Laughlin residence, Elizabethtown, PA	86	6.6
TOMT ₄ Squire residence, Bainbridge, PA	145	5.2
TOMT ₅ York Haven, PA Hydroelectric Plant	166	2.9
TOMT ₆ Newberrytown, PA Township Building	252	4.5
TOMT ₇ Falmouth Substation, Falmouth, PA	161	2.3
TOMT ₁₀ Goldsboro, PA Met. Ed. Monitoring Station	254	1.3
TOMT ₁₁ Beaver residence, Redland Acres, Etters, PA	284	4.6
TOMT ₁₂ Highspire, PA Turnpike Commission Building	321	5.4

APPENDIX VII

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF WATER QUALITY MANAGEMENT PROGRAM FOR MONITORING WASTEWATER DISCHARGES FROM THREE MILE ISLAND

OBJECTIVE

The monitoring program for discharges from Three Mile Island and for the Susquehanna River below Three Mile Island is designed for the following purposes: First, it serves as an early warning system to notify downstream water supplies and other water users should any high-level radioactive discharges occur. Second, it provides a historical account of the radiological quality of discharges from TMI and of the river to show what, if any, concentrations of radioactivity exist. Third, it serves as an independent back-up to the Metropolitan Edison (Met-Ed) monitoring program. Fourth, it should provide some degree of public confidence in any decisions that are made concerning any discharges.

EARLY WARNING SYSTEM

A continuous water system has been installed on the Radiological Outfall (001) at TMI. This system is comprised of a sodium iodide detector coupled to a single channel analyzer with rate meter and strip chart recorder output. The analyzer has a window width from approximately 300 kev to 700 kev and is capable of detecting concentrations of ^{131}I and/or ^{137}Cs of about 100 pCi/l in the counting chamber. An automatic telephone dialing system will activate paging units to alert DER Water Quality Management (WQM) and EPA personnel. The concentration level at which the paging unit is activated is variable and will be established based on the inventory of radionuclides in the contaminated water. (As of September 5, 1979 that level is set at approximately 1,000 pCi/l, based on ^{137}Cs as the limiting radionuclide.)

ALARM RESPONSE AND SAMPLING PLAN

Should the early warning system detect an unusual occurrence, a WQM staff member and EPA will be notified by an automatic telephone paging system. In such an event, the following procedures will be utilized:

1. The designated WQM staff member and the senior EPA representative will make telephone contact to activate the confirmation and notification procedures.

2. The EPA representative will notify the NRC and Metropolitan Edison and request examination of in-plant monitors (RML-7) for confirmation and appropriate action if necessary.

3. The EPA/WQM representative will proceed to TMI to collect a sample for laboratory analysis to confirm that the continuous sampler is operating and to examine the strip chart for evidence of high radioactivity. He will also contact NRC/Met Ed from the site to obtain the information from the in-plant monitors. The DER Bureau of Radiological Protection and other appropriate BWQM staff will be notified.

4. The water sample will be analyzed by gamma spectroscopy to a level less than one tenth of the maximum permissible concentration at the site boundary as given by 10CFR20.

5. The Bureau of Radiological Protection will evaluate the significance of the discharge based on all available data including analysis of the "grab" sample and, in consultation with the Bureau of Water Quality Management and EPA, determine whether downstream water users will be impacted.

6. The Bureau of Water Quality Management will notify the downstream water users that an unusual occurrence has happened, indicate to them the estimated impact of the discharge on their water supplies and, if appropriate, recommend closing the water intakes until the discharge passes. Further, the State of Maryland will be notified.

7. If an incident occurs, additional sampling on the river will be initiated to track the distribution of the discharge of radioactivity. Samples should be collected by BWQM Regional Staff at the York Haven Hydroelectric Dam at Brunner Island and at the Route 30 Bridge. Grab samples will be collected every 6 hours and analyzed as rapidly as possible by the EPA's Evan Press laboratory.

SAMPLING LOCATIONS

1. A compositing sampling device operates on the main outfall from Three Mile Island (Discharge No. 001). This samples the discharge every 20 minutes and composites it over a 24-hour period. The sample is taken to the EPA-operated laboratory at the Evangelical Press Building and analyzed by "gamma scan" to a level of 10 picocuries/liter. The Bureau of Radiological Protection will then take the sample and analyze for gross alpha, gross beta and tritium to a sensitivity consistent with routine surveillance protocol.

2. A compositing sampler will also be installed on outfall 005 (or in the vicinity) to monitor the discharge from the storm water basin on the eastern end of the Island. This sample will also be given a gamma scan by the EPA lab to a level of 10 picocuries per liter and the Radiological Protection lab will analyze the same sample for gross alpha, gross beta and tritium to a sensitivity consistent with routine surveillance protocol.

3. A weekly grab sample will be collected at City Island, above Three Mile Island, for background data. This sample will be analyzed by gamma scan to a level of 10 picocuries per liter and for gross alpha, gross beta and tritium to a sensitivity consistent with routine surveillance protocol. It is recognized that upstream facilities may introduce radioactivity into the river.

4. The City of Lancaster's water intake on the Susquehanna River will be sampled every 2 hours and composited once a day. This sample will be taken by the City of Lancaster personnel and transported to the Bureau of Radiological Protection laboratory for analysis. This sample will be analyzed in the same manner as the other river samples.

APPENDIX VIII

KEY STAFF AND OFFICES FOR LONG TERM MONITORING PROGRAM TMI

ORGANI- ZATION	TITLE	NAME	DUTY PHONE	NIGHT
EPA	EPA-TMI Office		FTS 590-3909	
	On-Site Coordinator	Erich Bretthauer	FTS 595-2969	(702) 457-6357
	Asst. On-Site Coordi- nator	Allan Smith	FTS 595-2969	(702) 870-3386
	Asst. On-Site Coordi- nator	Charles Costa	FTS 595-2969	(702) 451-4616
	Harrisburg Lab		(717) 783-8054	
	Region III - S&A Div. Office of Radiation Programs	Larry Miller Floyd Galpin	FTS 597-9390 FTS 597-8217	(609) 795-5083
HEW	TMI Operations Office	John Villforth	FTS 443-4690	(301) 424-5912
	TMI Operations Office	Michael Terpilak	FTS 443-3426	(301) 598-5633
	On-Site Coordinator	Charles Cox	FTS 590-3887	
NRC	Sr. TMI Site Rep.	John Collins	FTS 590-3950	(717) 948-8065
	Chief, Fuel Facility & Material Saftey Branch	George H. Smith	FTS 488-1200	(215) 326-9985
	Chief, Site Oper- ations	A. N. Fasano	FTS 590-3950	(717) 944-7880
	Senior Radiation Specialist	M. M. Shanbaky	FTS 590-3950	(717) 564-3876
DOE	Chief, Environ- mental Protection Public Safety Branch	L. Joseph Deal	FTS 233-4093	(215) 326-9985
	DOE Emergency Center		FTS 233-5555	(301) 353-5555
PENNSYLVANIA:				
DER	Director, Bureau of Radiation Protection	Thomas Gerusky	(717) 787-2480	(717) 763-9041
WQM	Director, Bureau of Water Quality Mgmt.	Lewis Bercheni	FTS 787-4317	(717) 432-5658
		Ken Walizer	FTS 787-8184	(717) 657-0031
		James Flesher	FTS 787-9665	(717) 921-8765
		Ernie Giovannitti	FTS 787-8184	(717) 258-3440
		Bill Middendorf	FTS 787-5027	(717) 697-0994

APPENDIX VIII (continued)

Pennsylvania Emergency Management Agency (PEMA)		FTS 783-8150	(717) 233-4028
Lancaster Water Co.	Mike Freedman	(717) 397-3501	
Wrightsville Water Co.	Jack Miller	(717) 561-1103	(717) 564-8220
Columbia Water Co.	Charles Gohn	(717) 684-2188	(717) 684-4862
State of Maryland	Ron Nelson	(301) 383-2744	

THREE MILE ISLAND MAILING ADDRESSES

EPA	U.S. Environmental Protection Agency P.O. Box 103 Middletown, PA 17057
HEW	Department of Health Education and Welfare Three Mile Island Site Trailer 205 Middletown, PA 17057
NRC	U.S. Nuclear Regulatory Commission Three Mile Island Site P.O. Box 311 Middletown, PA 17057

APPENDIX IX

KEY STAFF AND OFFICES FOR LONG TERM MONITORING PROGRAM TMI

ORGANIZATION	TITLE	NAME	DUTY PHONE	NIGHT
EPA	EPA-TMI Office		FTS 590-3909	
	On-Site Coordinator	Erich Bretthauer	FTS 595-2969	(702) 457-6357
	Asst. On-Site Coordinator	Allan Smith	FTS 595-2969	(702) 870-3386
	Asst. On-Site Coordinator	Charles Costa	FTS 595-2969	(702) 451-4616
	Harrisburg Lab		(717) 783-8054	
	Region III - S&A Div.	Larry Miller	FTS 597-9390	(609) 795-5083
	Office of Radiation Programs	Floyd Galpin	FTS 597-8217	
HEW	TMI Operations Office	John Villforth	FTS 443-4690	(301) 424-5912
	TMI Operations Office	Michael Terpilak	FTS 443-3426	(301) 598-5633
	On-Site Coordinator	Charles Cox	FTS 590-3887	
NRC	Sr. TMI Site Rep.	John Collins	FTS 590-3950	(717) 948-8065
	Chief, Fuel Facility & Material Safety Branch	George H. Smith	FTS 488-1200	(215) 326-9985
	Chief, Site Operations	A. N. Fasano	FTS 590-3950	(717) 944-7880
	Senior Radiation Specialist	M. M. Shanbaky	FTS 590-3950	(717) 564-3876
DOE	Chief, Environmental Protection Public Safety Branch	Joe Deal	FTS 233-4093	(215) 326-9985
	DOE Emergency Center		FTS 233-5555	(301) 353-5555
PENNSYLVANIA:				
DER	Director, Bureau of Radiation Protection	Thomas Gerusky	(717) 787-2480	(717) 763-9041
WQM	Director, Bureau of Water Quality Mgmt.	Lewis Bercheni	FTS 787-4317	(717) 432-5658
		Ken Walizer	FTS 787-8184	(717) 657-0031
		James Flesher	FTS 787-9665	(717) 921-8765
		Ernie Giovannitti	FTS 787-8184	(717) 258-3440
		Bill Middendorf	FTS 787-5027	(717) 697-0994

APPENDIX IX (continued)

Pennsylvania Emergency Management Agency (PEMA)		FTS 783-8150	(717) 233-4028
Lancaster Water Co.	Mike Freedman	(717) 397-3501	
Wrightsville Water Co.	Jack Miller	(717) 561-1103	(717) 564-8220
Columbia Water Co.	Charles Gohn	(717) 684-2188	(717) 684-4862
State of Maryland	Ron Nelson	(301) 383-2744	

THREE MILE ISLAND MAILING ADDRESSES

EPA	U.S. Environmental Protection Agency P.O. Box 103 Middletown, PA 17057
HEW	Department of Health Education and Welfare Three Mile Island Site Trailer 205 Middletown, PA 17057
NRC	U.S. Nuclear Regulatory Commission Three Mile Island Site P.O. Box 311 Middletown, PA 17057