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

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 18
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Metropolitan Edison Company, Jersey Central Power and Light Company, and Pennsylvania Electric Company (the licensees) sworn to January 31, July 31, August 21, September 4, and October 29, 1975, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. An environmental statement or negative declaration need not be prepared in connection with the issuance of this amendment.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment.

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3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the
Technical Specifications

Date of Issuance: July 23, 1976

ATTACHMENT TO LICENSE AMENDMENT NO. 18

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Revise Appendix B as follows:

Remove Pages	Insert Pages
v	v
3 - 6	3 - 6
13 & 14	13 & 14
35 & 36	35 & 36
40	40 & 40a
41 - 44	41 - 44a
45 - 60	45 - 60
65 & 66	65 & 66

The changed areas on the revised pages are shown by marginal lines.

Pages 42, 46, 48, 49, 58, and 66 are unchanged and are included for convenience only.

ENVIRONMENTAL TECHNICAL SPECIFICATIONS

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2.0 LIMITING CONDITIONS FOR OPERATION

Specification (Cont'd)

(2) During reactor cooldown conditions discharge temperature shall not exceed 12°F above inlet temperature and this temperature differential shall not be changed by more than 2°F during any one-hour period.

(3) If intake water temperature is 87°F or higher discharge temperature during normal operation shall be maintained at or below river ambient.

b. During the period between October 1 and March 31 the following effluent temperature limits will apply:

(1) During normal operation discharge temperature shall be no greater than 12°F above inlet temperature or 3°F below inlet temperature.

(2) During reactor cooldown conditions discharge temperature shall not exceed 20°F above inlet temperature and this temperature differential shall not be changed by more than 2°F during any one-hour period.

Specification (Cont'd)

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b. The delta temperature recorder located in the control room shall by used for monitoring the difference between river water inlet temperature and the discharge temperature. Should this delta temperature recorder be out of service, the difference between the river water inlet temperature and the discharge temperature shall be obtained from recorders located in the mechanical draft cooling tower pumphouse.

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2.0 LIMITING CONDITIONS FOR OPERATION

Bases

Natural draft cooling towers are utilized to cool the large heat load of the condenser. The mechanical draft cooling tower cools a mixture of service water and the natural draft cooling tower blowdown. The effluent from the mechanical draft cooling tower discharges to the river.

For normal operation, one pump and up to three fans will be operated to affect maximum cooling without intentionally discharging below river ambient. The tower will be operated manually by the operator from the control room to affect maximum cooling without intentionally discharging below river ambient. The tower was designed to limit discharges to 87°F on the hottest day.

As an operator aid, the MDCT can be operated in the automatic mode which shifts fans to half speed, reduces the number of fans operating and shifts fan operation from cell to cell. The automatic mode is used to help prevent icing of the MDCT while maintaining discharge temperature as close as possible to river water inlet temperature. The automatic control system, however, does not assure compliance with environmental Technical Specifications. The operator will take manual control when necessary to prevent icing or to improve cooling tower operation with regard to discharge temperature. It is expected that during sustained cold periods, the discharge will average 3°F above river ambient.

Bases

Instrumentation is required for two different purposes and is located in two places. One group of instruments is located in the control room to provide operator control intelligence. The second group of instruments is located in the mechanical draft cooling tower pumphouse and serves in connection with the automation of the towers but also serves to provide additional time-history recorded data and backup information for operator control intelligence in event control room instrumentation is out of service.

In the control room the following enables the operator to monitor and control discharge temperatures:

a. Delta temperature recorder -- discharge temperature minus river water inlet temperature.

b. River water inlet temperature on computer.

c. Heated water temperature to tower indicated.

d. Discharge temperature of tower is recorded and indicated.

In the cooling tower pumphouse, the following instrumentation is available on multipoint and continuous pen dragging recorders:

a. River water inlet temperature.

b. Heated water temperature to tower.

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2.0 LIMITING CONDITIONS FOR OPERATION

Bases (Cont'd)

However, since the tower performance is a function of air wet bulb temperature and since the wet bulb can increase many degrees in hours while the river temperature tracks much more slowly, the tower's performance can become ineffective. The worst example of this mismatch is a sudden warm day in winter with a frozen river. At such times the tower will be shut down, since continued operation would result in higher temperatures.

As an example of how TMI might perform with these restrictions with the tower shut down due to air/river temperature mismatch, the mixed river temperature, assuming a 33°F river and a winter river flow of 10,000 cfs would be 0.1°F above river ambient based on normal plant operation.

For cooldown operation, two pumps will be operated to pump over the mechanical draft cooling tower fill. The tower is designed to cool the effluent flow on the hottest day to 87°F. If the tower should be in the automatic mode of operation, the operator will shift to manual operation to achieve maximum cooling at the beginnning of cooldown. Note that an increased heat load is present at the beginning of cooldown which reduces the probability of freezing.

Near the end of the cooldown, the operator may shift to automatic control to preclude freeze-up.

If cooldown should occur at a time of air/

Bases (Cont'd)

c. Discharge temperature of tower.

d. Air dry bulb temperature.

e. Cooling tower basin water temperature near louvers.

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2.0 LIMITING CONDITIONS FOR OPERATION

Bases (Cont'd)

river temperature mismatch (as described under normal operation earlier) and should the tower operation add heat, the tower will be bypassed.

If the unit were to be cooled down with the mechanical draft cooling tower not operating, the mixed river temperature at beginning of cooldown would be <+ 3°F above river ambient based on a 33°F river with 10,000 cfs flow.

The above operating practices and the effluent temperature limits in this specification will insure compliance with the objectives.

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2.0 LIMITING CONDITIONS FOR OPERATION

2.2.3 pH

Objective

The purpose of this specification is to limit the pH of plant discharges to values which will produce no harmful effects to the Susquehanna River.

Specification

The pH, as measured at the plant discharge and at the waste neutralizing tank prior to release, shall have a value of not less than 6.0, nor more than 9.0, except that during those periods when the intake pH is greater than 9.0, the plant discharge pH shall not exceed the intake pH, and that during those periods when the intake pH is less than 6.0, the plant discharge pH shall not be less than the intake pH.

Bases

The pH of the Susquehanna River as measured in the vicinity of Three Mile Island is variable and values spanning almost the entire range

Monitoring Requirement

Objective

The purpose of this specification is to ensure compliance with Specification 2.2.3.

Specification

A determination of the pH of the contents of each tank of neutralized regenerant wastes will be made prior to release using installed instrumentation. All necessary adjustments to meet the specification will be made prior to initiation of the release. If the installed instrumentation is out of service, the necessary analyses will be performed prior to initiating the discharge using laboratory instrumentation. An analysis for pH will be performed on a sample taken from the plant river water discharge during the release of each tank of regenerant wastes, or at weekly intervals as a minimum frequency.

Bases

Discharge of neutralized regenerant wastes is the only normal plant operation which could cause a change in the pH of the discharge since all sumps

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2.0 LIMITING CONDITIONS FOR OPERATION

Bases (Cont'd)

from 5.0 to 10.0 have been recorded. Limiting the pH of discharge to the normal range of values insures that no pH related damage to river ecosystems or biota will result.

The limits on the pH of the waste neutralizing tank discharge will preclude sizable changes in the pH of the discharge to the river. For example, adding 300 gpm of pH 9.0 neutralizing tank discharge to a pH 8.0 stream at 17,250 gpm would raise its pH a calculated 0.06 unit, assuming no buffering action.

Bases (Cont'd)

and drains which are potential receivers of chemicals are collected in this tank.

2.3 RADIOACTIVE DISCHARGES

2.3.1 Liquid Effluents

Monitoring Requirements

Applicability

Applies to the controlled release of radioactive liquids from TMI Unit 1.

Objective

To define the limits and conditions for the controlled release of radioactive effluents to the environs to ensure that these releases

Objective

To ensure that radioactive liquid releases from the facility are within the limits of Specifications 2.3.1 a through e.

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3.0 DESIGN FEATURES AND OPERATING PRACTICES

Objective

This section contains a description of design features and operating practices which, if changed, might have a significant environmental impact.

Specification

If operating practices or design features are planned which deviate from those described in the bases below, an analysis of their potential environmental impact will be made and a course of action taken to alleviate potential adverse impacts. In addition, if the ecology of the river significantly changes at a future date as, for example, by major changes in water chemistry or reintroduction of shad, an analysis of expected impacts and a course of action to minimize the impacts will be provided.

Bases

3.1 Operation of Mechanical Draft Cooling Tower

Natural draft cooling towers are utilized to cool the large heat load of the condenser. The mechanical draft cooling tower cools a mixture of service cooling water and a small amount of natural draft cooling tower blowdown, which represents a much reduced heat load. The effluent from the mechanical draft cooling tower discharges to the river.

For normal operation, one pump will be operated with up to three fans to affect maximum cooling without intentionally discharging below river ambient. The tower will be operated manually by the operator from the control room to affect maximum cooling without intentionally discharging below river ambient.

As an operator aid, the MDCT can be operated in the automatic mode which shifts fans to half speed, reduces the number of fans operating and shifts fans operation from cell to cell. The automatic mode is used to help prevent icing of the MDCT while maintaining discharge temperature as close as possible to river water inlet temperature. The automatic control system, however, does not assure compliance with environmental Technical Specifications. The operator will take manual control when necessary to prevent icing or to improve cooling tower operation with regard to discharge temperature. During sustained cold periods, the discharge will average $3^{\circ}F$ above river ambient. However, since the tower performance is a function of air wet bulb temperature which can increase much more rapidly than the river temperature, the tower's performance can become ineffective. An example would be a sudden warm day while the river is still frozen. At such time the tower is shut down since its operation would result in increasing the discharge temperature. During such periods, the discharge temperature is approximately $10^{\circ}F$ above river ambient.

For cooldown operation two pumps are operated to pump over the mechanical draft cooling tower fill. If the tower is in the automatic mode of operation, it is shifted to manual operation to achieve maximum

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cooling at the beginning of cooldown. With average winter weather conditions, the tower discharge is approximately 12°F above river ambient at the beginning of cooldown and reduces to approximately 3°F some 12 hours later. Near the end of cooldown the tower may be shifted back to automatic control to preclude freeze-up.

3.2 Chemical Usage

This section describes the chemicals used in the plant which are discharged to the environment. The equipment in which the chemicals are used along the quantities per batch or rate of continuous discharge and expected discharge frequency are included.

3.2.1 Water Treatment

The clarifier continually receives approximately 0.05 lb. of cationic polyelectrolyte and 0.6 lb. of anionic clay per 1000 gallons of water treated to remove suspended solids from the river water. Assuming an average flow of 100 gpm. through the clarifier, sludge containing approximately 60 lb. of clay and 5 lb. of polyelectrolyte plus a highly variable amount of suspended solids removed from the river water is blown down from the clarifier each day. The sludge is processed in diatomaceous earth pressure filters and the filtrate is released to the plant river water discharge. The solids component is pressed into dewatered blocks. Their disposal is described under solid waters.

A cation - anion string in the cycle makeup demineralizer system uses 2260 lb. of sulfuric acid and 1340 lb. of sodium hydrode for each regeneration. An additional 2350 lb. of sodium hydroxide is required to neutralize the spent regenerants prior to discharge, resulting in 3270 lb. of neutralized sodium sulfate contained in approximately 70,000 gallons of water. Based upon a demineralized water use of 40,000 gallons per day and a production of 300,000 gallons between regenerations, this quantity would be released each 7.5 days. Release rates are based upon flow through the mechanical draft cooling tower.

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C.	Entrainment of Plankton	Semi-monthly at 4-hour intervals over a 24-hour period during April thru October	Intake and Discharge	Pumping	Counting and determination of extent of Zooplankton mortality identification to the lowest feasible taxon. A continuing record will be maintained to allow comparison of variation of numbers with time.

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A continuing aquatic population surveillance program (D and E) shall be conducted during the first three years of operation. The results will be reviewed at the end of the first 30 months and the program terminated at the end of three years unless the results of the review indicate the need for additional data.

D.	Fish	Every Two weeks, March through October	At locations indicated on Figure 1	Trap nets and Shoreline Seining	Counting, identification to the lowest feasible taxon, weighing, determination of reproduction status and condition. A continuing record will be maintained to allow comparison of variation of numbers with time. Replicate samples will be taken both inside and outside the thermal plume.
E.	Macro-Inverte-brates	Semi-monthly April thru October	At location indicated on Figure 1.	Nets or dredges	Counting and identification to the lowest feasible taxon. A continuing record will be maintained to allow comparison of variation of numbers with time. Replicate samples will be taken both inside

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TABLE 2A
ENVIRONMENTAL MONITORING PROGRAM
SAMPLE IDENTIFICATION SYSTEM

A. Sample Identification System

VV - WWW - XXYZ: General code for identification of samples where:

VV: Power Plant identification code (The Three Mile Island Code is TM)

WWW: Media Sampled

AI: Air Iodine
AQ: Aquatic
AQF: Aquatic, Fish (Edible Portion)
AQI: Aquatic, Invertebrates
AQM: Aquatic, Minnows and small fish
AQP: Aquatic, Plants (Plankton, etc.)
AQS: Aquatic, Sediment
BI: Bird Impaction
DW: Discharge Water
E: Soil
FP: Food Products
FPA: Food Products, Apples
FPB: Food Products, Ground Beef
FPC: Food Products, Cherries
FPE: Food Products, Eggs
FPF: Food Products, Peaches
FPH: Food Products, Honey
FPL: Food Products, Leafy Vegetables
FPN: Food Products, Corn
FPP: Food Products, Poultry
FPS: Food Products, String Beans
FPT: Food Products, Tomatoes
FPV: Food Products, Various
GA: Game
GAD: Game, Deer
GAP: Game, Pheasants
GAR: Game, Rabbit
GAS: Game, Squirrel
ID: TLD (Immersion Dose)
IDI: Ionization Chamber Measurement (Immersion Dose)
M: Milk
PPT: Plant Pathology Transect
NV: Vegetation Analysis
RW: Precipitation
SW: Surface Water
THB: Thyroid, Bovine
V: Vegetation
WW: Well Water

XX Angular Sector of Sampling Location

Sixteen sectors of 22½ degrees each are centered about the reactor site. Sector 1 is divided equally by the due North axis and other sectors are numbered in a clockwise direction in the following manner: 2=NNE, 3=NE, 4=ENE, 5=E, 6=ESE, 7=SE, 8=SSE, 9=S, 10=SSW, 11=SW, 12=WSW, 13=W, 14=WNW, 15=NW, and 16=NNW.

Y Radial Zone of Sampling Location (Radial Distance from Plant)

S: On-site location
A: 0-1 mile off-site
B: 1-2 miles off-site
C: 2-3 miles off-site
D: 3-4 miles off-site
E: 4-5 miles off-site
F: 5-10 miles off-site
G: 10-20 miles off-site
H: > 20 miles off-site

Z Station's Numerical Designation within each sector and zone use 1, 2,...

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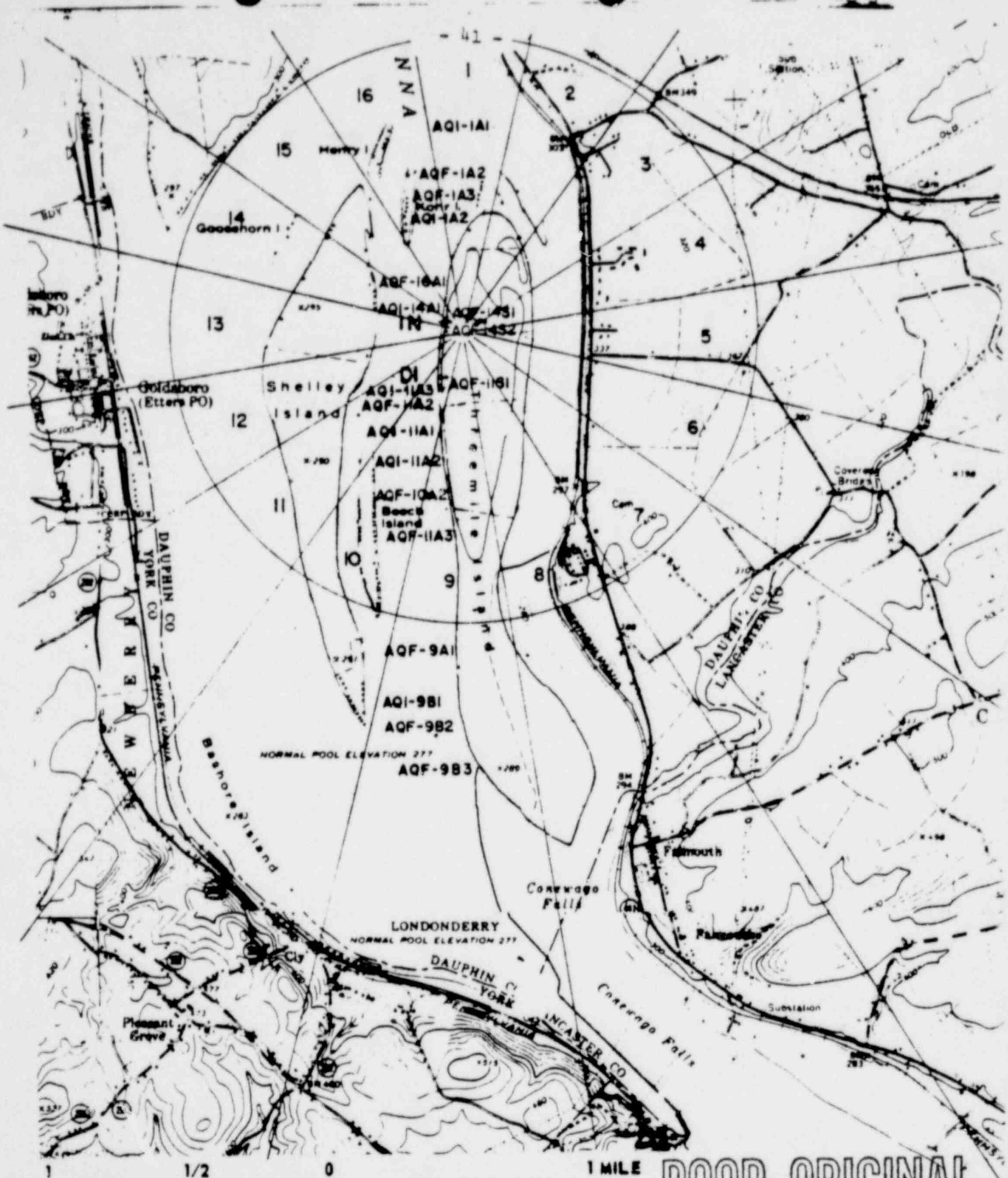

LEGEND SCALE

AQF - AQUATIC FISH

AQI - AQUATIC INVERTEBRATES

IN - INTAKE

DI - DISCHARGE

AQUATIC ENVIRONMENTAL MONITORING STATIONS

THREE MILE ISLAND NUCLEAR STATION

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and outside the thermal plume. Water samples for standard water quality analyses as described in Section 4.2.2 will be obtained concurrent with biota samples.

Bases

The postoperational aquatic biological surveillance program of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station will begin upon the issuance of an operating license. The impingement study will determine a baseline number for organisms lost at the Three Mile Island Nuclear Station so that the significance of such loss with regard to the resource can be assessed. The entrainment study will determine the types and quantities of plankton, fish eggs and fish larvae entrained in the cooling water systems so that the effects of entrainment can be predicted. The fish study will provide the qualitative and quantitative observations necessary to describe the present fish population in the vicinity of Three Mile Island, to detect any changes which occur after plant startup, and to determine whether changes, if they occur, were caused by operation of the station. The macro-invertebrate study will serve the same purpose as that of the fish study.

4.1.2 Terrestrial

4.1.2.1 Bird Impaction on Cooling Towers

Objective

The purpose of the bird impaction study is to provide information on mortality and injury to avifauna, if any, resulting from impaction on natural draft cooling towers.

Specification

Monitoring of the bases of the cooling towers will be conducted during periods of peak migration under conditions of limited visibility. The base of each cooling tower will be searched on mornings following days and/or nights of limited visibility, during March to June and September to November inclusive. The areas to be searched will include the top of the fill, all catwalks,

and the ground around the base of each tower out to a distance of 100 feet from the base. Any dead or injured birds found will be collected, identified, and the numbers and locations will be recorded. On days in which incidents of mortality or injury occur, description of meteorological conditions of the previous day and/or night will be included in the daily log. This program will be continued for one year.

Bases

Since some potential exists for bird injury and mortality due to impaction on the natural draft cooling towers, and since the possible levels of this impaction are not known, specific report levels, protection limits or the need for such measures cannot be established at this time. The study described herein will provide information needed to establish a protection limit or report level or to establish that the measurement of bird impaction is not necessary due to an insignificant impact.

The documentation of bird mortality and injury due to impaction will allow an estimate to be made of the effect of the cooling towers on migrating birds.

4.1.2.2 Effects of Cooling Tower Salt Drift on Crops and Natural Vegetation

Objective

The purpose of the cooling tower salt drift study is to determine if damage to natural vegetation and crops is occurring from salt drift.

Specification

The study areas, at locations indicated on Figure 2, which were used in a vegetational-type mapping analysis during preoperation will be checked annually to determine if measurable changes are occurring in species composition, relative abundance and relative dominance of naturally occurring vegetation due to salt drift. Sampling will be done near the station in the predicted area of drift influence and also in control areas removed from the station.

Monthly visual examination of natural vegetation and agricultural crops will be made in the areas shown on Figure 2A during the growing season (April through October) to detect if any physical damage is occurring. Samples of any suspected drift-damaged vegetation found will be

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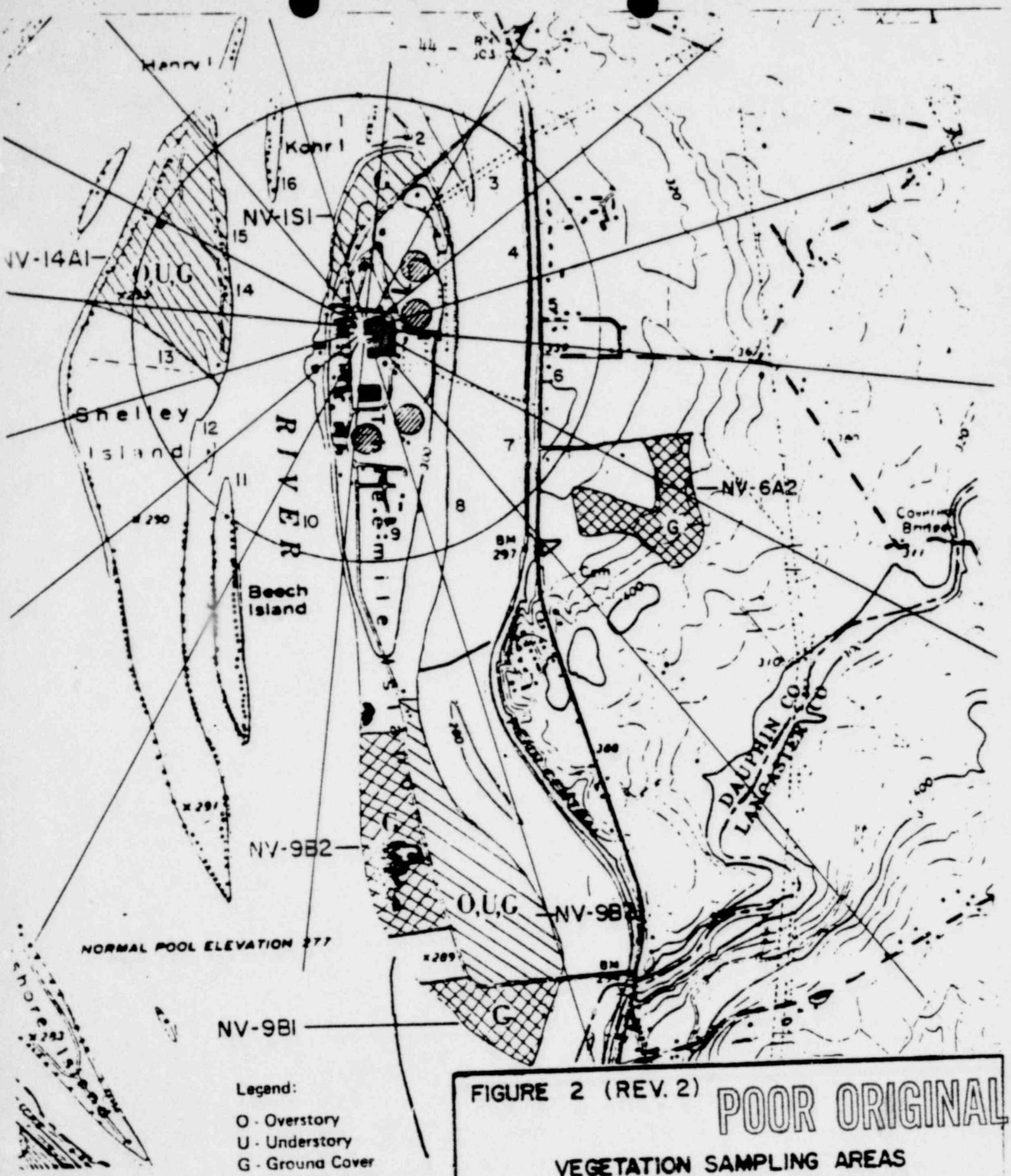

FIGURE 2 (REV. 2)

VEGETATION SAMPLING AREAS

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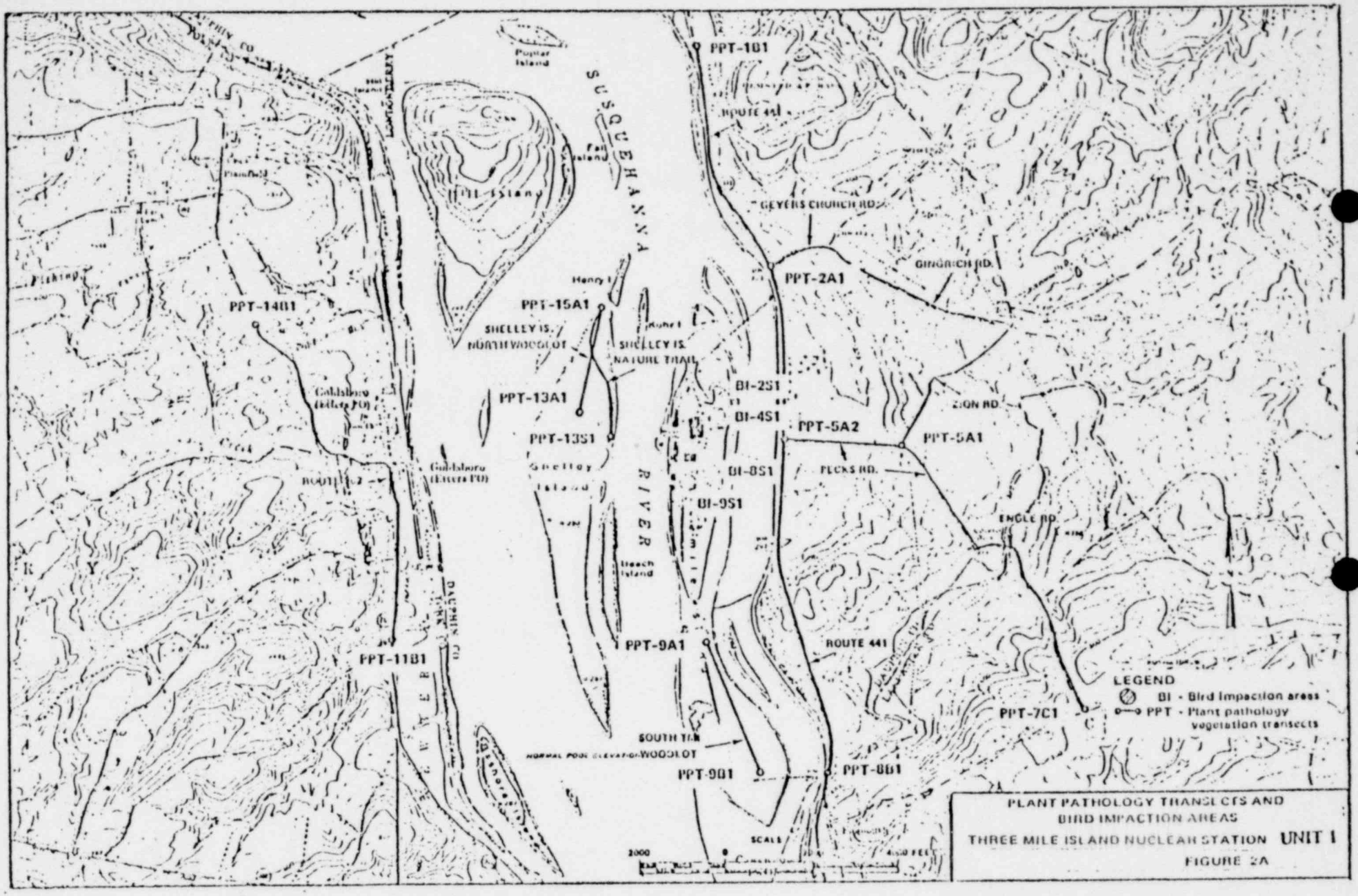

chemically analyzed for drift minerals.

This program will be continued for two years.

Bases

Since some potential exists for damage to area vegetation from cooling tower drift and since the actual effect is unknown, specific report levels, protection limits, or the need for such measures cannot be determined at this time. The study described herein will provide information needed to establish a protection limit or report level or to establish that the measurement of the drift effect is unnecessary due to insignificant impact.

Measurement of species composition, relative abundance, and relative dominance will determine changes in the natural vegetative community that may be due to plant operation. Increases or decreases in certain species should become evident if they do in fact occur. Examination of vegetation for physical disorders will indicate if salt damage is occurring with respect to actual injury or death of plants. This information will be supplemented by analyses to determine concentrations of certain minerals in the plant material.

4.2 Chemical

4.2.1 Aquatic

Objective

To define operational surveillance or special studies of aquatic chemical effects derived from the station. The chemical parameters of this study will include chlorine, heavy metals, suspended solids and dissolved solids. Alkalinity is related to the pH of the water and may be included if deemed necessary in checking pH monitoring at the river water discharge.

Specification

The aquatic chemical surveillance program shall be conducted as follows:

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Parameter	Location	Sample Method	Frequency	Program Duration
Chlorine	River Water Discharge	Pump	Continual[1]	Continual
Heavy Metals[3]	Above River Water Intake	Surface Sampler	Monthly	2 years after startup.
Heavy Metals[3]	River Water Discharge	Surface Sampler	Monthly	2 years after startup.
Suspended Solids	River Water Discharge	Pump	Weekly[2]	2 years after startup.
Dissolved Solids	River Water Discharge	Pump	Weekly[2]	2 years after startup.

(1) Information for this parameter is derived from the continual monitor required in Specification 2.2.1.

(2) Information for these parameters is derived from analyses performed under Specification 2.2.2.

(3) To include iron, chromium, zinc, copper, manganese, and nickel.

Bases

The postoperational aquatic chemical surveillance program of the Susquehanna River in the vicinity of the Three Mile Island Nuclear Station will begin upon the issuance of an operating license. This program is designed to provide quantitative information on chemical discharges from the plant. Chlorine discharge concentrations are monitored continually by installed plant instrumentation.

It is expected that there will be no significant difference in the concentration of heavy metals between the plant river water intake and discharge. Potential changes in concentrations of heavy metals due to passage of water through the plant could result from discharge of neutralized regenerant wastes, corrosion of river water piping or leakage of corrosion inhibitors. The metals selected for monitoring were selected based on metals known to be in the river, materials used in the construction of river water systems and the composition of the corrosion inhibitor used in the closed cooling systems. Since no significant increase in concentrations of heavy metals is expected, the measurement downstream is unlikely to be of value in defining the chemical plume.

The only significant addition of dissolved solids to plant effluent is the discharge of neutralized regenerant wastes from the cycle makeup demineralizers. In addition, dissolved solids are concentrated in cooling tower blowdown due to evaporation loss in the cooling towers. Since limits are placed on discharge of dissolved solids by Specification 2.3.2 and concentrations are monitored on a minimum weekly frequency during plant operation, the inclusion of this parameter with the postoperational surveillance program after a period of 1 - 3 years is considered unnecessary.

There is expected to be no significant addition of suspended solids to the plant discharge. A period of 1 - 3 years inclusion of this parameter within the postoperational surveillance program is considered sufficient to justify efficiency and reliability of plant

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filtration equipment, especially since Specification 2.3.2 limits suspended solids concentrations in the river water discharge and suspended solids concentrations are measured on a minimum weekly frequency during plant operation.

4.2.2 Ambient Water Quality

The water sampling program will be undertaken to monitor the ambient water quality of the Susquehanna River. The program will provide baseline data for the biological program. The samples will be collected on a semi-monthly basis in conjunction with the biological surveillance program (Section 4.1.1E). The following items will be included in the water quality analyses:

pH	So_4
Dissolved O_2	Cl
Susp. Solids	Alkalinity
Ca	
Mg	Nitrate Nitrogen
Na	Ortho-phosphate (Sol.)
K	Phosphate (Total)
Fe (Total)	Nitrite Nitrogen
Ammonia Nitrogen	Bacterial Analysis - Fecal Coliform
Phenol	
Heavy Metals (listed on page 46)	

4.3 Physical

4.3.1 Thermal Plume Mapping

Objective

To provide temperature data for defining the discharge plume and to check the accuracy of the analytical plume model.

Specification

Sampling studies shall be made during the first year of operation to identify and characterize the discharge plume with respect to temperature. The data shall be collected from a sufficient number of sampling points located to provide a patterned coverage of the plume. The staff will review the results at the completion of the one year studies to determine if sufficient review and operating condition combinations have been examined and will determine if the studies need to be extended.

The studies shall be conducted during conditions of normal and low flows and extreme temperature conditions to provide the necessary data to validate the analytical plume model. Wind speed and direction measured at the north weather station (I-A-I on Figure 3), air and water temperature and current velocity should be taken concurrently with plume measurements. During the first planned winter cooldown in which an effluent $\Delta T \geq 10°F$ is expected, and when weather and icing conditions permit monitoring to take place (a "qualifying" cooldown), the 5° ΔT isotherm shall be located at its widest point to determine size of the zone of passage. If the effluent ΔT fails to reach 10°F during that cooldown, the 5°F ΔT isotherm shall be located again during succeeding "qualifying" cooldowns until the isotherm has been located five times or is measured during a period in which the effluent $\Delta T \geq 10°F$.

Bases

The plume mapping will define the temperature gradients in the plume. Special attention will be given to the region near the discharge structure where momentum and mixing are the prevalent processes influencing the plume's horizontal and vertical dimensions.

4.4 Environmental Radiological Monitoring

Objective

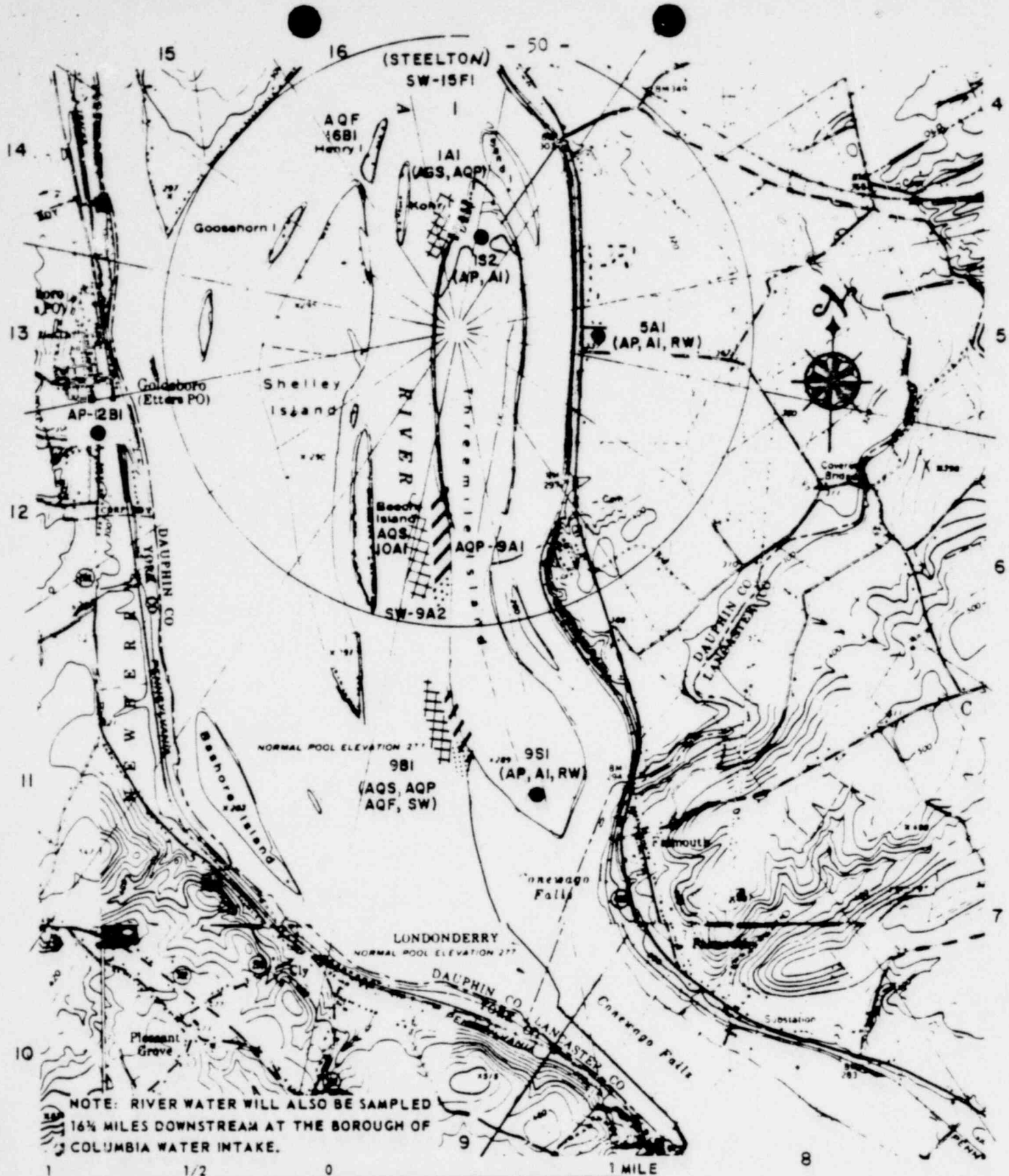
An environmental radiological monitoring program shall be conducted to verify that radioactive releases are within allowable limits and that plant operations have no detrimental effects on the environment.

Specification

a. Environmental samples shall be collected and analyzed according to Table 3 at the locations presented in Figures 3, 4, 5, 6 and 7.

b. Reports shall be submitted in accordance with the requirements of Section 5.6 (Plant Reporting Requirements).

c. During the seasons that animals producing milk for human consumption are on pasture, samples of fresh milk will be obtained monthly from these animals at locations presented in Table 3 and analyzed for their radioiodine content, calculated as iodine-131. Analysis will be carried out within eight days (one I-131 half-life) of sampling. Suitable analytical procedures will be used to determine the radioiodine concentration to a sensitivity of 0.5 picocurie per liter of milk at the time of sampling. For activity levels at or above 0.5 picocurie per liter, the overall error (one sigma confidence level) of the analysis will be within ± 25%. Results



LEGEND

AQS - AQUATIC SEDIMENT STATION
AQP - AQUATIC PLANTS STATION
AQF - AQUATIC FISH (EDIBLE PORTION)
AP - AIR PARTICULATE
AI - AIR IODINE
SW - SURFACE WATER
RW - PRECIPITATION

RADIOLOGICAL ENVIRONMENTAL MONITORING STATIONS

THREE MILE ISLAND NUCLEAR STATION

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FIGURE 3
(REV. 1)

TABLE 3 - Environmental Sampling

Sample Type	No. of Sample Indicator	Stations Background	Type of Analysis	Sensitivities	Collection Frequency	Collected Site
Air	3	1	^{131}Iodine Charcoal Cart.	$1x10^{-13}$ µCi/cc	Charcoal Cartridge-Weekly	See Fig. 3 & 4
	5	3	GB	$5x10^{-14}$ µCi/cc	Particulate Weekly	
	5	3	GS (2)	(4)	Quarterly	
Precipitation	3	1	GB	$7x10^{-8}$ µCi/ml	Monthly (if available)	See Fig. 3 & 4
			GS	(4)	Quarterly (if available)	
			^{89}Strontium	$5x10^{-9}$ µCi/ml	Semi-Annually	
			^{90}Strontium	$1x10^{-9}$ µCi/ml	Semi-Annually	
Radiation TLD	15	4	Gamma	20 mrem/yr	Quarterly	See Fig. 5 & 6
Milk	4	1	^{131}Iodine	$5x10^{-10}$ µCi/ml	Monthly*	See Fig. 7
			^{89} Strontium	$5x10^{-9}$ µCi/ml	Quarterly*	
			^{90}Strontium	$1x10^{-9}$ µCi/ml	Quarterly*	
Green Leafy Vegetables	3	1	^{131}Iodine	$5x10^{-8}$µCi/gm(4)	Annually(at harvest)	See Fig. 7
			GS	(4)	Annually(at harvest)	
River Water	2	1	GS (1)	(4)	Monthly (3)	See Fig. 3
			Tritium	$8x10^{-6}$µCi/ml	Quarterly (3)	
City of Columbia	1	-	GS	(4)	Composite Sample Analyzed Monthly	See Fig. 4
			Tritium	$8x10^{-6}$µCi/ml	Composite Sample Analyzed Quarterly	
			^{89}Strontium	$1x10^{-9}$µCi/ml	Composite Sample Analyzed Quarterly	
			^{90}Strontium	$1x10^{-9}$µCi/ml	Composite Sample Analyzed Quarterly	

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TABLE 3 - Environmental Sampling (Cont'd)

Sample Type	No. of Sample Stations Indicator	Background	Type of Analysis	Sensitivities	Collection Frequency	Collected Site
Sediment	2	1	GS	(4)	Semi-Annually (July and October)	See Fig. 3
			^{89}Strontium	2.5×10^{-8} µCi/gm	Semi-Annually (July and October)	
			^{90}Strontium	5×10^{-9} µCi/gm	Semi-Annually (July and October)	
Fish	1	1	GS	(4)	Semi-Annually, July and October (if available)	See Fig. 3
			^{89}Strontium	2.5×10^{-8} µCi/gm	Semi-Annually, July and October (if available)	
			^{90}Strontium	5×10^{-9} µCi/gm	Semi-Annually, July and October (if available)	
Aquatic Vegetation	2	1	GS (1)	(4)	Semi-Annually (July and October) (If Available)	See Fig. 3

INDEX: GB - Gross Beta GS - Gamma Scan

(1) In the event of icing or dangerous conditions on the Susquehanna River, the sampling frequency may be extended until river conditions permit sampling.

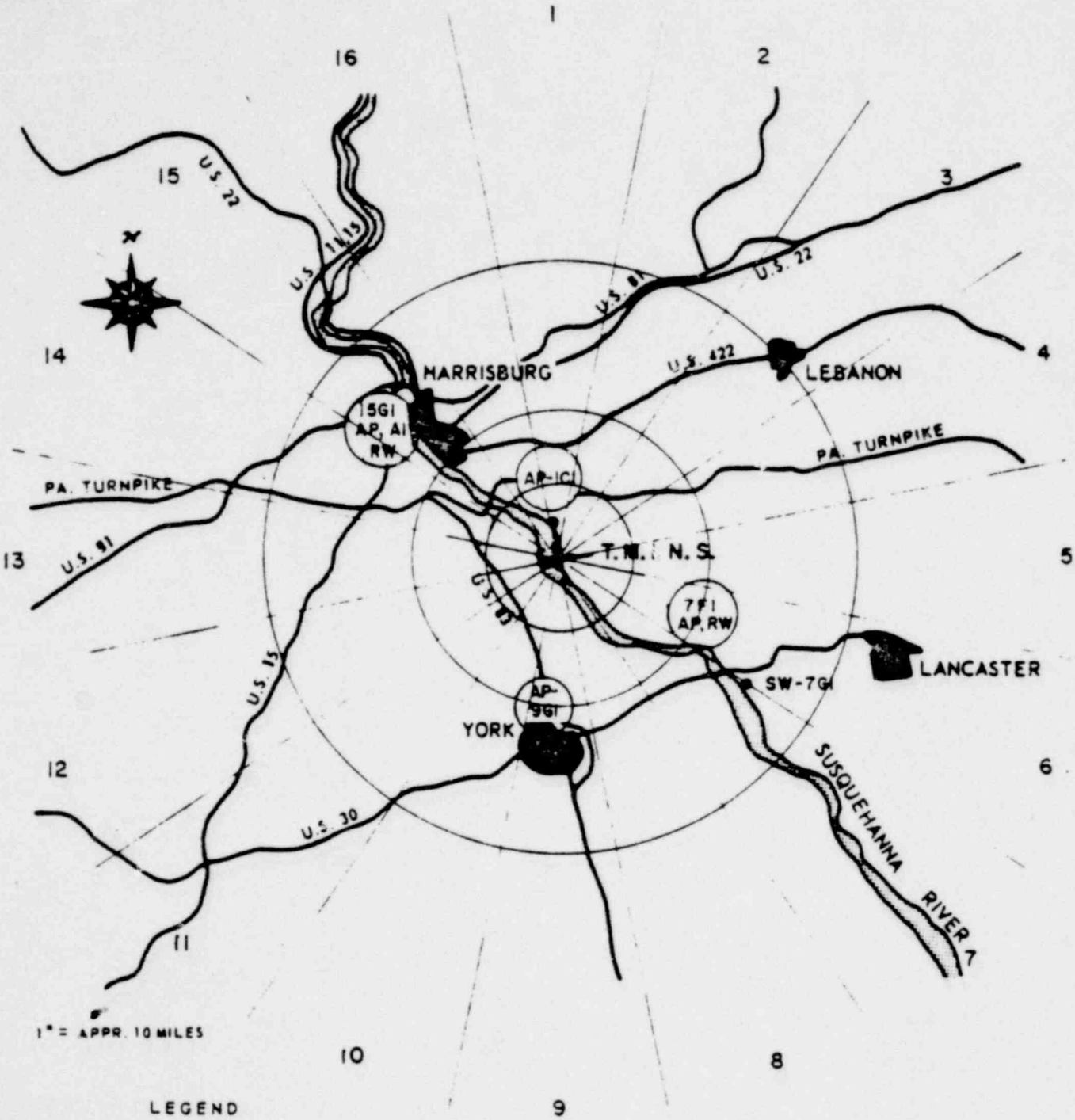
(2) Composite of all samples for quarter in two groups - Background Samples and Indicator Samples.

(3) River water samples will be collected weekly and composited monthly and quarterly analyses.

(4) Sensitivities are based on Met-Ed data, Vendors Data & E.P.A. Surveillance Guide ORP/SID 72-2.

(5) Milk Indicator sampling stations shall be restricted to pastures within a five mile radius of the plant. In the event that more than four pastures are available within this radius, the four pastures with the highest anticipated concentrations shall be sampled. If four or less pastures are available within the radius, all pastures shall be sampled.

POOR ORIGINAL



LEGEND

RW - PRECIPITATION STATION
SW - SURFACE WATER
AP - AIR PARTICULATE
AI - AIR IODINE STATION

AIR AND PRECIPITATION SAMPLING STATIONS

THREE MILE ISLAND NUCLEAR STATION

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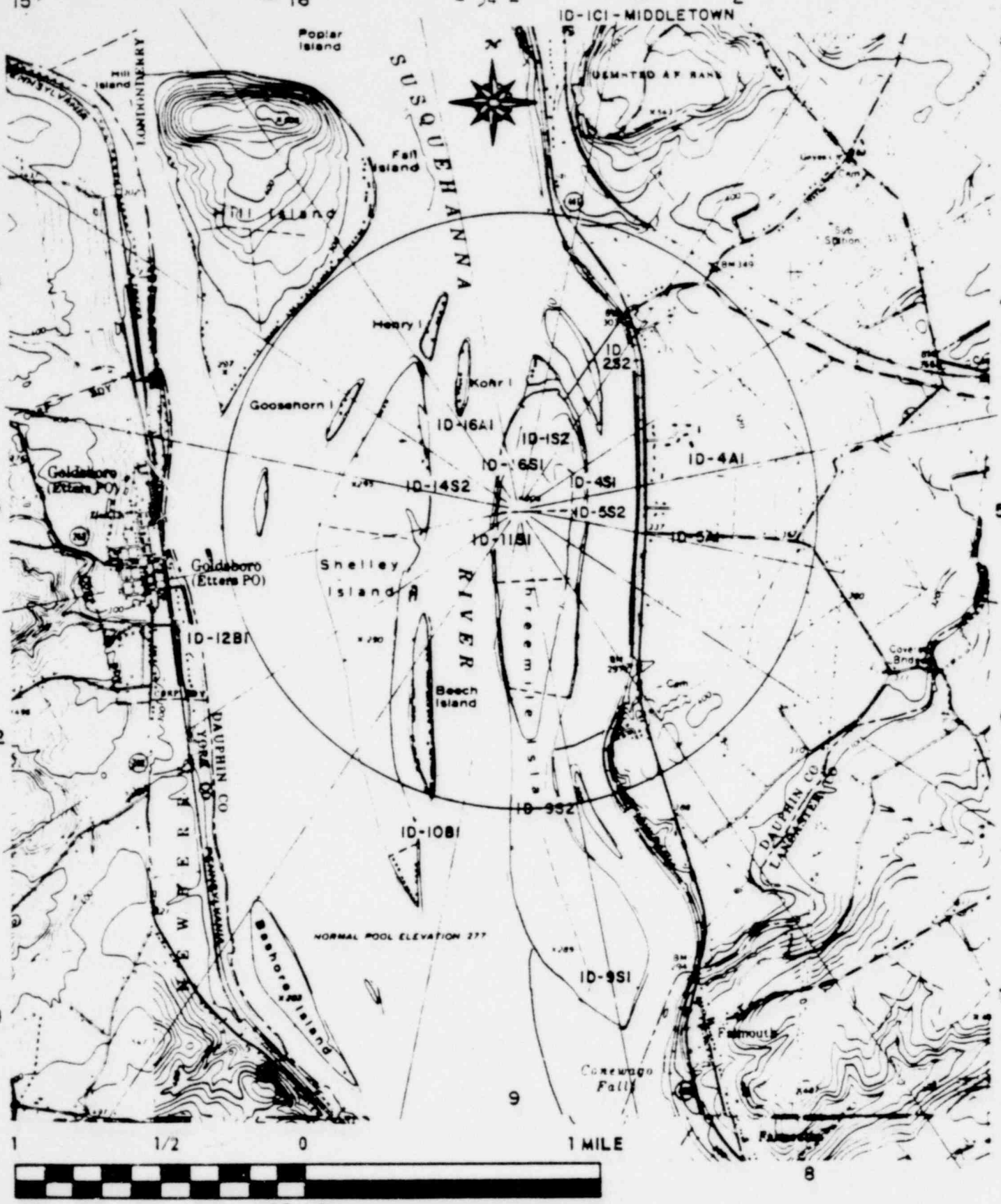
FIGURE 4
(REV. 1)



TLD INDICATOR STATIONS
THREE MILE ISLAND NUCLEAR STATION

LEGEND

ID - TLD STATION (IMMERSION DOSE)

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POOR ORIGINAL

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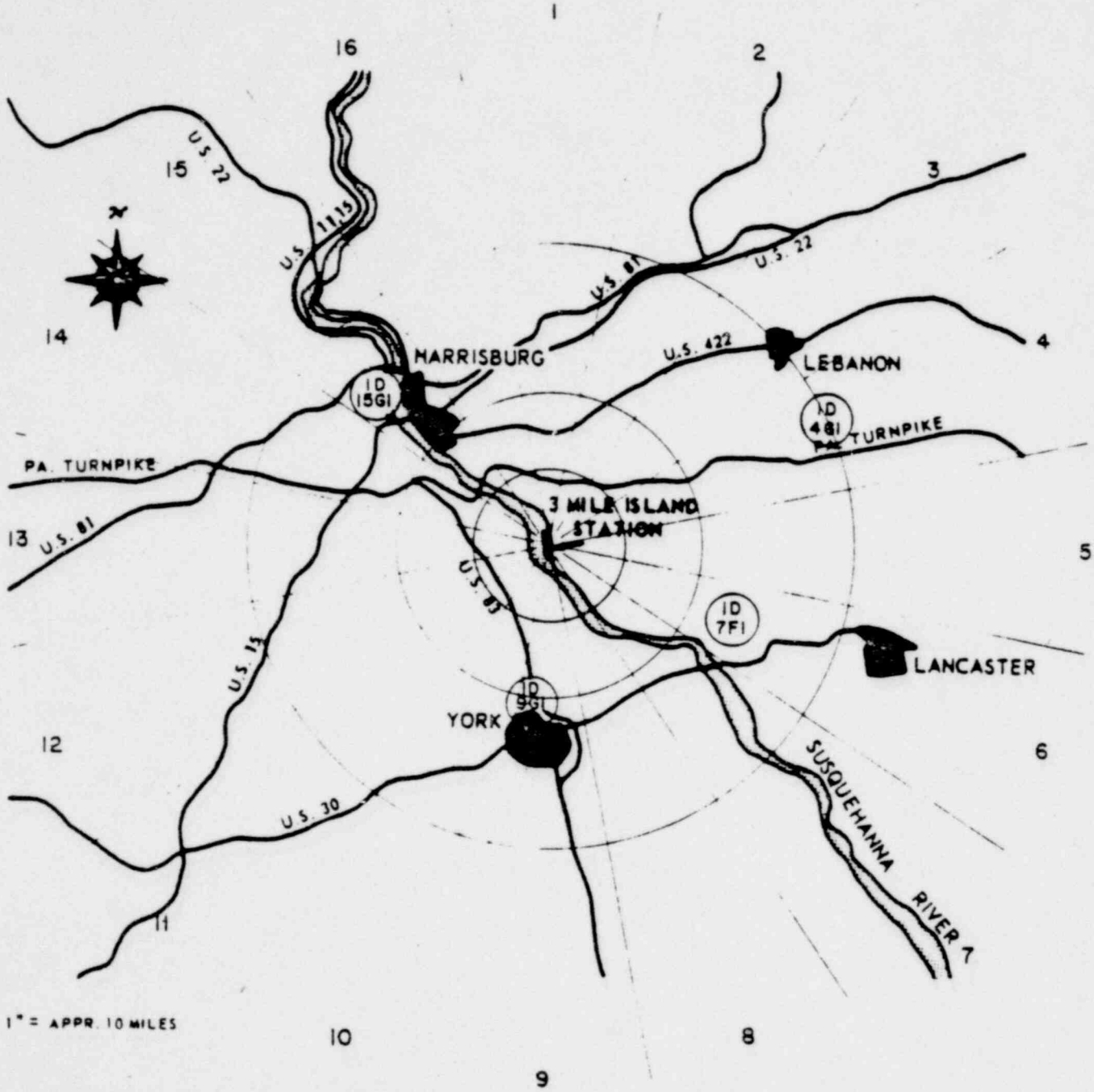
FIGURE 5
(REV. 1)

POOR ORIGINAL



LEGEND

ID - TLD STATION (IMMERSION DOSE)

TLD BACKGROUND STATIONS
THREE MILE ISLAND NUCLEAR STATION

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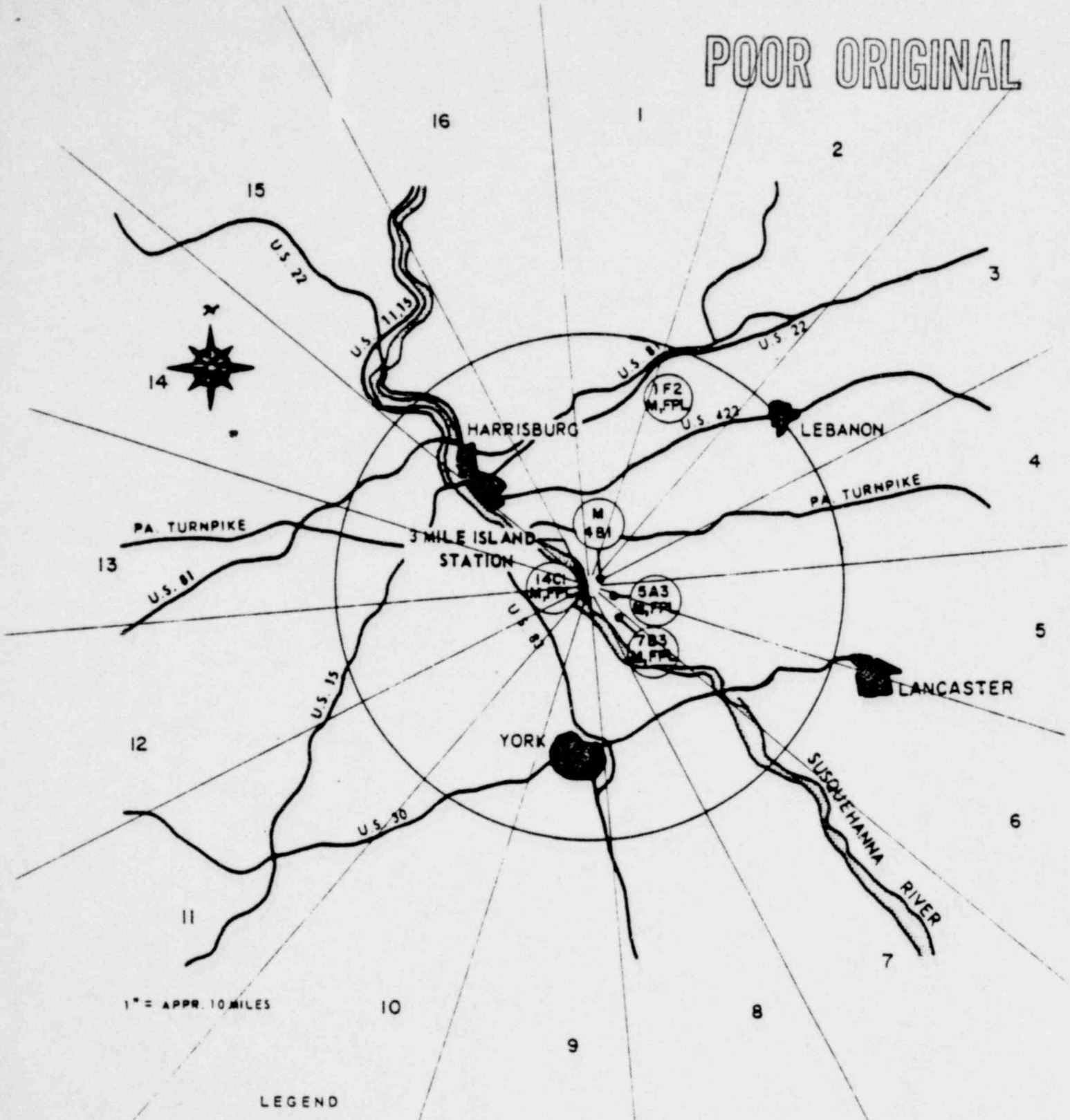
FIGURE 6
(REV. 1)

POOR ORIGINAL



LEGEND

FPL - FOOD PRODUCT, LEAFY VEGETABLE STATIONS

M - MILK STATIONS

MILK & VEGETABLE SAMPLING STATIONS

THREE MILE ISLAND NUCLEAR STATION

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FIGURE 7
(REV. 1)

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will be reported, with associated calculated error, as picocuries of I-131 per liter of milk at the time of sampling, in accordance with Reporting Requirements for Environmental Radiological Monitoring.

Special attention will be paid to those locations where milk is produced for direct consumption by humans - e.g., the family farm.

d. A census will be conducted during the midpoint of the grazing season to determine the location of cows in potentially affected areas within a five-mile radius of the plant.

If it is learned via the census that there are a considerable number of additional locations where milk is produced in the vicinity of the plant, the location(s) may be chosen which serves as a valid indicator of other locations in that meteorological sector, rather than sampling every location.

Bases

The number and distribution of sampling locations and the various types of measurements described in Table 3, together with the preoperational background data, will provide verification of the effectiveness of plant effluent control and indication of measurable changes in the activity of the environment.

Weekly samples may be missed in the event of adverse conditions such as weather, equipment failure, etc. It is not intended that these missed samples be resampled prior to the next scheduled sample date. Monthly and longer period samples, if missed due to these conditions, will be taken within a reasonable time after the adverse condition no longer exists. All deviations from the sampling schedule shall be described in the semi-annual report.

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5.0 ADMINISTRATIVE CONTROLS

Objective

To describe the administrative and management controls established to provide continuing protection to the environment and to implement the environmental technical specifications.

Specifications

5.1 Responsibility

Corporate responsibility for implementation of the Environmental Technical Specifications and for assuring that plant operations are controlled in such a manner as to provide continuing protection to the environment have been assigned by the President of Metropolitan Edison Company to the Manager-Generation Division. This responsibility is carried out by the Generation Division through the organization set forth in Figure 8.

Responsibility for compliance with these Environmental Technical Specifications rests with the Station Superintendent. The procedures and controls necessary to ensure compliance are implemented through the staff of the Supervisor-Technical Support. The Station Superintendent is responsible for the environmental compatibility of plant operations, and he shall ensure that:

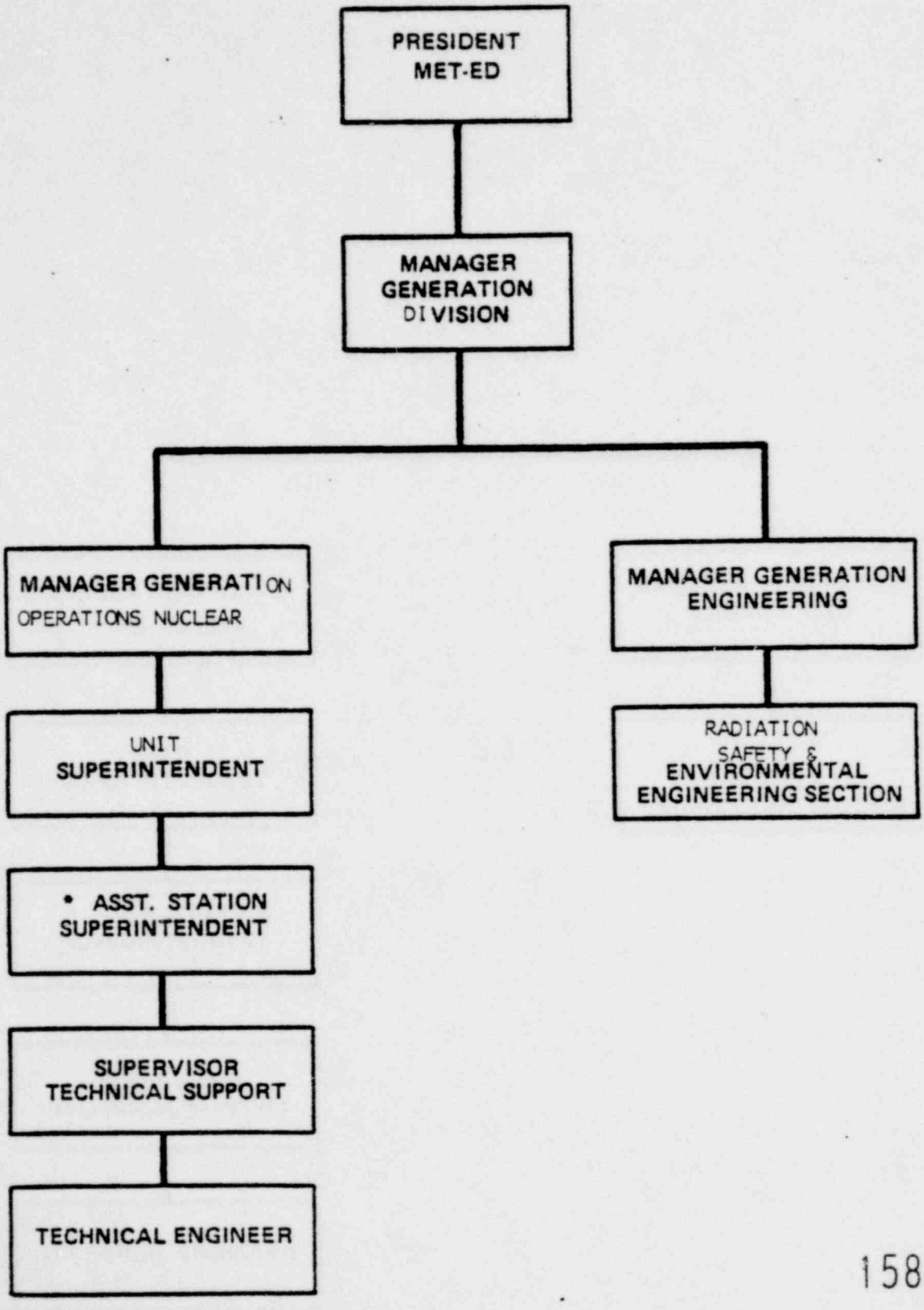
A. All proposed changes to the procedures delineated in Section 5.5 of these Environmental Technical Specifications and design changes to such equipment or systems as is the subject of these procedures are reviewed by the station staff to determine whether or not they might involve a significant environmental impact.

B. All proposed changes considered under 5.1.A above which were determined thereunder to possibly involve a significant environmental impact are analyzed to determine the extent of the impact.

C. All proposed changes to the procedures delineated in Section 5.5 of these Environmental Technical Specifications and design changes to such equipment or systems as is the subject of these procedures that would have a significant adverse effect on the environment or which involve a significant environmental matter or question not previously reviewed and evaluated by the AEC are reported to the AEC prior to implementation. Proposed changes which the analysis shows would have a favorable environmental impact or which involve a significant environmental matter or question previously reviewed and approved by the AEC are forwarded to the Manager-Generation Engineering for independent review.

FIGURE 8

ORGANIZATION FOR IMPLEMENTATION OF
ENVIRONMENTAL TECHNICAL SPECIFICATIONS



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• WHEN ASSIGNED

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D. Reports are submitted and records are kept in accordance with 5.6 and 5.7 of the Environmental Technical Specifications. Violations of these Environmental Technical Specifications are investigated and appropriate corrective action taken to prevent recurrence. Responsibility for the independent audit and review functions concerning environmental matters as defined in section 5.2 of these Environmental Technical Specifications has been assigned by the Manager-Generation to the Manager-Generation Engineering. When the review function is performed by the Radiation Safety and Environmental Engineering Section, the Manager-Generation Engineering shall ensure that necessary audits of those review functions are performed independently of the Radiation Safety and Environmental Engineering Section.

When organizations other than Metropolitan Edison Company are utilized to establish and execute portions of these Environmental Technical Specifications, compliance with the Environmental Technical Specifications in such instances shall remain the responsibility of Metropolitan Edison Company.

5.2 Organization

Organization of the personnel responsible for implementation, audit and review of these Environmental Technical Specifications including the Corporate level is as shown on Figure 8 of these Environmental Technical Specifications. In all matters pertaining to compliance with these Environmental Technical Specifications, the Station Superintendent shall report to and be directly responsible to the Manager-Generating Stations.

5.3 Audit and Review

Independent audit and review functions for environmental matters will be performed under the direction and control of the Manager-Generation Engineering. Independent review of environmental matters and auditing of station activities relating to these Environmental Technical Specifications will be conducted by the Radiation Safety and Environmental Engineering Section, reporting to the Manager-Generation Engineering. Their review will be audited by or under the direction of the Manager-Generation Engineering. These audits and reviews will encompass:

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POOR ORIGINAL

c. Nonradiological

In the event a Limiting Condition for Operation is exceeded, a report will be made within 24 hours by telephone and telegraph to the Director of Regulatory Operations Region 1 followed by a written report within two weeks to the Director of Regulatory Operations Region 1 (cc to Director of Licensing, USAEC).

The written report and, to the extent possible, the preliminary telephone and telegraph report, will:

1) Describe, analyze and evaluate the occurrence including extent and magnitude of the impact;

2) Describe the cause of the occurrence; and

3) Indicate the corrective action taken (including any significant changes made in procedures) to preclude repetition of the occurrence and to prevent similar occurrences involving similar components or systems.

d. Changes

1) When a change to the plant design, to the plant operation or to the procedures described in Section 5.5 is planned which would have a significant adverse effect on the environment or which involves an environmental matter or question not previously reviewed and evaluated by the AEC, a report on the change will be made to the AEC prior to implementation. The report will include a description and evaluation of the change including a supporting benefit-cost analysis.

2) Changes or additions to permits and certificates required by Federal, State, local and regional authorities for the protection of the environment will be reported. When the required changes are submitted to the concerned agency for approval, they will also be submitted to the Deputy Director for Reactor Projects, Directorate of Licensing, USAEC, for information. The submittal will include an evaluation of the environmental impact of the change.

3) Requests for changes in Environmental Technical Specifications will be submitted to the Deputy Director for Reactor Projects, Directorate of Licensing, USAEC, for prior review and authorization. The request will include an evaluation of the impact of the change, including a supporting benefit-cost analysis.

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e. Other

If harmful effects or evidence of irreversible damage are detected by the monitoring programs, the licensee will provide an analysis of the problem and will develop a course of action to be taken to alleviate the problems. If the ecology of the river significantly changes at a future date as, for example, by major changes in water chemistry or reintroduction of shad, the licensee will provide an analysis of expected impacts and a course of action to minimize the impacts.

5.7 Records Retention

5.7.1 Records and logs relative to the following areas will be retained for the life of the plant.

a. Records and drawing changes reflecting plant design changes made to systems and equipment as described in Section 5.6.2.d.

b. Records of environmental surveillance data.

c. Records to demonstrate compliance with the Limiting Conditions for Operation in Section 2.

5.7.2 All other records and logs relating to the Environmental Technical Specifications shall be retained for 5 years.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-289

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 18 to Facility Operating License No. DPR-50 issued to Metropolitan Edison Company, Jersey Central Power and Light Company, and Pennsylvania Electric Company which revised Technical Specifications for operation of the Three Mile Island Nuclear Station, Unit 1, located in Dauphin County, Pennsylvania. The amendment is effective as of its date of issuance.

The applications for the amendment comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

DUPLICATE
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The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental statement, negative declaration or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

For further details with respect to this action, see (1) the applications for amendment submitted by letters dated January 31, July 31, August 21, September 4, and October 29, 1975, and (2) Amendment No. 18 to License No. DPR-50. These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the State Library of Pennsylvania, Government Publications Section, Education Building, Harrisburg, Pennsylvania.

A copy of item (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 23rd day of July 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors