GPU Nuclear

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number

September 27, 1985
5211-85-2162

Office of Nuclear Reactor Regulation
Attn: J. F. Stolz, Chief
Operating Reactors Branch No. 4
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Stolz:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
On-Site Disposal of Site Generated Filter Cake

GPU Nuclear Corporation (GPUN) has proposed to the State of Pennsylvania, Department of Environmental Resources (PaDER), that two pre-operational chemical cleaning basins located at Three Mile Island Nuclear Station, be used as a disposal facility for site generated filter cake. These basins have existed at the site since 1972, and were designed for treatment of industrial waste water.

The filter cake is a diatomaceous earth-based, industrial waste residue generated by the station's industrial waste filtration system. It does not contain any measurable amount* of radioactive fission or activation products. The Cs-137 concentrations are less than 2 pico curies per gram which is the upper limit of regional background concentration. Thus measured radioactivity of the filter cake, disposed of in the basins, is equivalent to or less than background measurements in the area of TMI.

Attached for your information are GPUN's Phase I and Phase II Submittals to the PaDER which describe the facility and its use. Also enclosed is a letter from PaDER approving phase I of the application; Phase II approval is anticipated shortly.

* Measurable amount is concentrations above LLD (Lowe :l of Detection) using approved environmental analysis techniques e. ·ma spectroscopy.

A001
1/1

GPUN desires to utilize this facility soon after approval from PaDER. We would appreciate any comment you have by October 27, 1985.

Sincerely,

H. D. Hukill
Director, TMI-1

HDH/MI/0371A

Enclosures:

1) GPUN Letter No. 5230-84-2119 dated September 12, 1984
2) GPUN Letter No. 5230-85-2017 dated April 1, 1985
3) PaDER Letter No. 5230-85-3003 dated February 25, 1985

Nuclear

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5230-84-2119

September 12, 1984

Mr. Edward R. Simmons, Director
Bureau of Solid Waste Management
Penna. Department of Environmental Resources
407 South Cameron Street
Harrisburg, PA 17101

Dear Mr. Simmons:

Subject: On-Site Disposal Facility for Site Generated Filter Cake

GPU Nuclear proposes to make use of the two Pre-operational Chemical Cleaning Basins located at the Three Mile Island Nuclear Station, for disposal facilities of site generated filter cake. The filter cake is a non-hazardous, diatomaceous earth based, industrial waste residue generated by the station's industrial waste water treatment and filtration facility. Accompanying this letter of intent is the following information:

1. Phase I Application for Permit for Solid Waste Disposal.
   - Form No. 1
   - Module No. 2 - Soils, Geology and Groundwater Information, and

2. Geotechnical Engineering Investigation Report for the Proposed Solid Waste Disposal Facility.

Upon your Bureau's approval, GPU Nuclear will begin work on Phase II of the permit application.

Should you have any questions or require any further information in regard to this permit request, please contact Mr. Thomas A. Grace, our Environmental Licensing Engineer, at (717) 948-8793.

Sincerely,

H. D. Hukill
Director, TMI-1

HDH:TAG:vjf

Enclosures

SOILS, GEOLOGY AND GROUNDWATER INFORMATION

MODULE NO. 2

PHASE I

PROPOSED
SOLID WASTE DISPOSAL FACILITY
GPU NUCLEAR CORPORATION
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA

Exhibits Appended to "Soils, Geology and Groundwater Information - Module No. 2 - Phase I"

- Exhibits A, B, C & D
  - USGS Topographical Map
  - USDA-SCS Soil Map
  - Test Boring & Test Pit Location Plan
  - Test Pit Logs

- Exhibit E (Under Separate Cover)

  "Report on Geotechnical Engineering Investigation for Proposed Solid Waste Disposal Facility - GPU Nuclear Corporation - Three Mile Island - Middletown, Pennsylvania" including the following appendices:

  - Appendix A - Plate No. 1 - Project Location Plan

    Plate No. 2 - Photographs of Existing Basins and Proposed Disposal Facility

    Plate No. 3 - Boring and Test Pit Location Plan

    Plate Nos. 4, 5 and 6 - Photographs of Test Pits and Existing PVC Vinyl Liners

August, 1984

DATE PREPARED
8-24-84

BUREAU OF SOLID WASTE MANAGEMENT

APPLICATION FOR PERMIT FOR SOLID WASTE DISPOSAL and/or PROCESSING FACILITIES

FORM NO. 1

I.D. NUMBER

PHASE NO. 1

ee INSTRUCTIONS on Reverse Side

1. Applicant (Name and Address)
GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, PA 17057

2. Authorized Agent (Name, Title and Address)
Mr. Thomas A. Grace
Environmental Licensing Engineer
GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, PA 17057

DEPT. USE ONLY

Date Rec'd

Publ. Date

Date Issued

3a. Property Owner(s) (Name and Address)
GPU Nuclear Corporation
100 Interpace Parkway
Parsippany, N.J. 07054

Telephone Number 201-263-6500

b. Site Acquisition

X Presently owned By General Public Utilities Corp.

__ Will purchase

__ Will lease for ____ years

4. Type of Operation Solid Waste Disposal Facility

5.
Name of Facility Three Mile Island

Address of Facility Route 441 South
(Include Access Road Name and Legislative Number)
Middletown, PA ZIP 17057

City-Borough-Township Londonderry Twp. County Dauphin

6. U.S.G.S. Map Location of Facility

Map Name Middletown Quad Date 1963 (Photo revised 1972)

7.5' Quad [X] 15' Quad [ ] Provide 7.5' Quad if published

Center of Facility: LAT. 40° 09' 26"
LONG. 76° 43' 18"

Facility location measured from S.E. corner of Map:

N.E. Corner – NORTH 6.00 in. WEST 13.45 in.

N.W. Corner – NORTH 6.00 in. WEST 13.45 in.

S.E. Corner – NORTH 5.60 in. WEST 13.45 in.

S.W. Corner – NORTH 5.60 in. WEST 13.45 in.

7. General Information: Existing [ ] Proposed [X]

Number of acres proposed for permit 0002.0 ±

Total acres of the property 0360

Planned life of the facility 15 ± years

Has this facility been included as a part of the Solid Waste Management Plan for the area?

YES [ ] NO [X]

Is this facility located in a coal mine?

Yes [ ] No [X]

(If yes, submit County Commissioner Approval)

8. Documents prepared by: (Name, Title and Address)
Felix T. Kitlinski, P.E.
F. T. Kitlinski & Associates, Inc.
3608 N. Progress Avenue
Harrisburg, PA 17110
Telephone Number 717-652-8620

9. AFFIDAVIT:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF Dauphin SS:

Sworn and subscribed to before me this

12th Day of September 19 84

[illegible] NOTARY PUBLIC

MY COMMISSION EXPIRES JUNE [illegible]
Member, Pennsylvania Association of Notaries

My Commission Expires ____

PRINT or TYPE Name to be Signed: Date: 9/12/84

I, H.D. Hukill, Vice President/Director TMI duly sworn according to law, depose and say that I ~~(am the applicant)~~ (am an officer or official of the applicant) ~~(have the authority to make this application)~~ and that the documents, statements submitted as part of this application are true and correct to the best of my knowledge and belief.

Signature H D Hukill

DATE PREPARED
8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

I. LOCATION

A. The name and date of the latest edition of the 7.5 minute topographic map covering the area is Middletown, PA Quadrangle (1963) - Photorevised 1972.

1. Is the required copy or, if not available, a topographic map of equivalent scale attached? X YES ___ NO

2. Is the proposed and/or existing facility shown on the 7.5 minute topographic map? X YES ___ NO

3. Supply location of the facility, measured to the nearest 0.05 inch North and West from the southeast corner of the 7.5 minute topographic map or express location in latitude and longitude. (Degrees, minutes and seconds)

(a) Sanitary Landfill
(1) Proposed North ____.____; West ____.____ Latitude ____ Longitude ____
(2) Existing North ____.____; West ____.____ Latitude ____ Longitude ____

(b) Impoundments: Locate a point at the center of each impoundment.

(1) Proposed
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____

(2) Existing
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____
North ____.____; West ____.____ Latitude ____ Longitude ____

(c) Other (describe): Solid Waste Disposal Facility for site generated industrial waste filter cake to be stored in two (2) existing impoundment basins.

(1) Proposed North 5.80"; West 13.45" Latitude 40° 09'26" Longitude 76° 43'18"
(2) Existing North ____.____; West ____.____ Latitude ____ Longitude ____

B. Is the required large scale map showing the facility attached? X YES ___ NO

1. Is the large scale topographic map drawn to the following minimum scale? scale 1" = 200' Contour interval 10' X YES ___ NO

2. Is the following information plotted on the large scale map:

(a) Location of soils/geologic/and hydrologic test pits, wells or borings? X YES ___ NO

(b) The sprayback or leachate recirculation systems. ___ YES ___ NO X N/A

C. All of the following which occur within the site boundaries or within 0.25 mile of the site must be plotted on the large scale map and/or the 7.5 minute topographic map.

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

I. LOCATION (continued)

Check the appropriate space:

	7.5 min. topo map	large scale map	not applicable
1. Water wells			X
2. Springs			X
3. Swamps			X
4. Streams			X
5. Public water supplies			X
6. Other bodies of water	X	X	
7. Sinkholes			X
8. Underground and/or surface mines			X
9. Mine pool discharge points			X
10. Mining spoil piles or mine dumps			X
11. Quarries			X
12. Sand and gravel pits			X
13. Gas and oil wells			X
14. Diversion ditches (existing)			X
15. All water quality monitoring point		X	
16. Occupied dwellings			X
17. Roads			X
18. Power lines			X
19. Pipelines			X
20. Public buildings			X
21. Abandoned canal			X

II. SOILS

A. List each of the soil series and phases present on the site.

Soil Series - Phase

1. Lw - Lindside silt loam, coal overwash
2. Tg - Tioga fine sandy loam, high bottom
3.
4.
5.

B. Is the required copy of the U.S.D.A. Soil Conservation Service soil map for the area showing site boundaries attached? X YES ___ NO

C. Have borings or test pits been made to describe soils and determine their depth? X YES ___ NO

1. Are their locations shown on both the large scale map and the soils map? X YES ___ NO (large map only)

2. The minimum thickness of soil to horizon(s) containing 60% or more coarse fragments is 228± inches.

a. How was soil thickness determined? Test Borings and Test Pits

b. What is the degree of weathering of the coarse fragments? None

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

II. SOILS (continued)

3. Attach pit or excavation descriptions written in the following format:

Pit #	Depth	Color	Texture	Structure	Consistence	Mottling
Example:						
Pit # 1	0"-12"	dark brown	sandy loam	granular	friable	none
	12"-24"	yellowish brown	silt loam	subangular blocky	firm	none
	24"-40"	brown	loam	prismatic	hard	grayish brown mottles
	40"+	bedrock				
Pit # 2	etc. . .					
. . # 3	etc. .					

4. Have laboratory analysis been performed and attached on samples from backhoe pits or borings to determine acceptability of soils for: a. Cover material b. renovative material Yes

D. 1. What are the drainage characteristics of the soil? "k" factors of 10^{-3} to 10^{-5} cm/sec

2. For sites proposing a natural liner for leachate collection, provide permeability in cm/sec and thickness of material in inches. (Include laboratory data)

E. What is the maximum slope at the proposed site? 1 to 2 percent

F. What is the shallowest depth from the surface to mottling? No mottling to 240± inches

1. How was the above determined? Test Pits and Test Borings

G. Is there a fragipan present? ____ YES X NO

1. What is the shallowest depth to the fragipan? N/A inches

a. How was the above determined? Test Pits and Test Borings

b. Name and address of the soil scientist or geologist supplying the above data:

Name Felix T. Kitlinski, P.E., Geotechnical Engineer, Soil Scientist
F. T. Kitlinski & Associates, Inc.
Street 3608 N. Progress Avenue
City and State Harrisburg, Pennsylvania Zip 17110-9698
Phone number (include area code) (717)-652-8620

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

II. SOILS (continued) PHASE I

Sources of Data: Soil Survey Report for Dauphin County, Pennsylvania; and Test Pits, Test Borings, Laboratory Tests and Site Reconnaissances

III. GEOLOGY

A. All of the following which occur within the site boundary or within 0.25 mile of the site are to be plotted on the large scale map and the 7.5 minute topographic map.

1. Location (s) of maximum and minimum thickness of glacial deposits
2. Lithologies
3. Areas where bedrock outcrops
4. Faults
5. Lineaments
6. Fracture traces
7. Directions of ground water flow

B. Sediments

1. Is the site within the glaciated area of Pennsylvania? ____ YES __X__ NO

2. Are there
   a. glacial deposits present under the propose site? ____ YES __X__ NO
   b. colluvial deposits ____ YES __X__ NO
   c. alluvial deposits __X__ YES ____ NO
   d. lacustrine deposits ____ YES __X__ NO

3. Describe the type and texture of the unconsolidated materials:

   Brown, fine sandy silt with some clay; and brown medium to coarse sand and gravel with silt and clay

4. What is their maximum thickness? 34.0 feet

5. What is their minimum thickness? 19.0 feet

6. How were the thicknesses determined? Test Borings

7. Are the location(s) of maximum and minimum thicknesses shown on the large scale map? ____ YES __X__ NO

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

III. GEOLOGY (continued)

8. Discuss the effects of these materials on discharges from the proposed facility.

m There are no discharges from this facility to the ground water. If accidental outages should percolate downward, the alluvial deposits would provide an adequate degree of filtration/renovation, particularly the fine grained phases.

C. Bedrock

1. Formation name Gettysburg Formation

2. Lithologies (plot on large scale map if more than one lithology)

Soft red shales and medium to fine-grained red sandstones.

3. Is the location of all places where the bedrock is less than 5 feet plotted on the large scale map? ____YES X NO

4. How were the locations determined? N/A

5. Does bedrock crop out within the boundaries or within 200 feet of the proposed facility? ____YES X NO

6. Are all outcrops shown on the large scale map? N/A ____YES ____NO

D. Weathering

1. Characterize the degree of weathering Weathered in top two feet in some cases.

2. Has a saprolite developed on the bedrock? X YES ____NO

a. What is the shallowest depth from the surface to bedrock 19 feet.

b. Describe the texture Highly weathered red shale fragments with clayey silt.

3. If bedrock is a carbonate rock: N/A

a. Are there any undrained surface depressions or sinkholes at the site? N/A ____YES ____NO

b. Are all sinkholes within 0.25 mile of the site shown on the 7.5 minute topographic map and/or on the large scale map? N/A ____YES ____NO

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8-24-84

DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

III. GEOLOGY (continued)

E. Structure

1. Are all lineaments and fracture traces on the site and within 0.25 miles of the site located on the 7.5 minute topographic map and/or the large scale map? Alluvial deposits prevent reliable fracture trace analysis. ___ YES X NO

2. Briefly characterize these fractures, joints, etc. and discuss their control on the movement of infiltrating water and ground water. The fractures, etc., are below the water table. Ground water will follow the fractures, etc., in flowing towards the nearby Susquehanna River.

3. Describe the regional structure of bedrock in the area of the site? The bedrock has a monoclinal dip to the north and northwest.

4. Give a detailed description of the local structure There is insufficient information available to describe the local structure because of the alluvial deposits which mantle the site.

5. Describe folding as it applies to the site Alluvial cover prevents the determination of the presence of variations from the regional dip.

   a. Strike and plunge of fold axis are: N/A

      Strike _____ Plunge _____

   b. Location of site in relation to local structure N/A

6. Attitude of bedding

   a. Strike NE and dip 20° ± of Gettysburg formation. Interpreted from geologic map and verified by test borings.

   b. Strike _____ and dip _____ of _____ formation.

   c. Strike _____ and dip _____ of _____ formation.

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DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

III. GEOLOGY (continued)

PHASE I

d. Are there extractable coal seams beneath the site that are not being presently mined?

____YES X NO

e. If "d" is yes, would mining these coal seams have any effect on the proposed facility? N/A

____YES ____NO

Sources of Data:

1. Driller's Logs and Test Borings
2. "Geology and Mineral Resources of Middletown Quadrangle, PA" - G. W. Stose & Anna I. Jones, Bulletin 840, U.S.G.S., 1933
3. Site Reconnaissances

Comments: (Attach additional sheets if necessary)

Name and address of geologist supplying the above data:

Name: James A. Humphreville

Street: 211 S. President Avenue

City & State: Lancaster, PA Zip 17603

Phone Number (Include area code): (717)-397-1034

DATE PREPARED
8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

III. GEOLOGY (continued)

7. Attitude of jointing Information not available for the site. (Item Nos. 7 thru 11)
   a. Strike _____ and dip _____ of joints.
   b. Strike _____ and dip _____ of joints.
   c. Strike _____ and dip _____ of joints.

8. What is the respective spacing of these joints?
   a. _____
   b. _____
   c. _____

9. Are joints open? (explain) _____YES _____NO
   a. _____
   b. _____

10. Cleavage
   a. Strike _____ and dip _____ of cleavage.
   b. Strike _____ and dip _____ of cleavage.
   c. Strike _____ and dip _____ of cleavage.

11. Faults
   a. Strike _____ and dip _____ of faults.
   b. Strike _____ and dip _____ of faults.
   c. Strike _____ and dip _____ of faults.

12. Are the locations of all faults that occur within 0.25 mile of the site's boundaries shown on the large scale map and 7.5 minute topographic map? ____YES X NO

F. Land Use

1. Are there any active or inactive *surface* mines at the site or within the site property boundaries? ____YES X NO
   If inactive, are they under a Surface Mining Bond? ____YES ____NO

2. Are there any active or inactive *deep* mines at the site or within 0.25 mile of the site boundaries? ____YES X NO
   a. What is the minimum depth to mined-out area? _____ feet
   b. What is the aerial extent of the mined-out area? _____
   c. What mineral resource was extracted? _____
      (1) If coal, name the seam(s) that were mined. _____

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

IV. HYDROLOGY

A. Have test pits _____, borings X, or wells _____ (check one or more) been made for the hydrologic investigation? X YES _____ NO

1. Is the required complete geologic description (log) of all earth materials penetrated included? X YES _____ NO

2. If a well, what was the method of drilling? Core Boring Drilling Rig

B. Depth to ground water table

1. The maximum depth to the water table within the site is 28 feet. (Boring No. 3)

   a. Date of measurement 7-31-84.

   b. The location is shown on the 7.5 minute _____ or large scale X map (check one)

   c. If measurement is from a well or pit, give date of completion for same 7-12-84

2. The minimum depth to the water table within the site is 13.3 feet. (Boring No.

   a. Date of measurement 7-13-84.

   b. Is the location shown on the 7.5 minute _____ or large scale X map (check one)

   c. If measurement is from a well or pit, give date of completion for same 7-10-84

3. Describe seasonal water table fluctuations at the above locations.
   The seasonal fluctuations are not known, but are expected to be less than about 3 feet.

4. Describe all perched or special water table conditions. Minimum depth to the perched water table is _____. N/A

5. Does ground water drain to deep mines? _____ YES X NO

DATE PREPARED
8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

IV. HYDROLOGY (continued)

PHASE I

C. Have you shown the direction (s) of ground water movement from the site on the large scale or X 7.5 minute map (check one)?

a. Describe how the above was determined:

Water level measurements and study of topographic setting.

b. The location of the ground water discharge point(s) affected by this facility is

Susquehanna River

c. Discuss the rate of ground water flow at this site as it applies to the operation of this facility:

The rate of ground-water flow will not apply to the operation of the lined basins at this facility.

D. Describe below the *proposed* ground water quality monitoring points for approval. (For sanitary landfills, monitoring point proposals are subject to final approval of the Engineering Design Plans. No wells are to be drilled until final approval of the Engineering Design Plans.) Use numbers only and number all monitoring points consecutively. No monitoring wells are proposed.

1. Wells, (check one). For multiple wells indicate with monitoring point number (a) for existing and (b) for proposed.

(a) _____ For existing wells complete the table below.

(b) _____ For proposed new well construction, complete the table from your specifications.

Monitoring Point Number	Drilling Method	Depth	Diameter	Casing		Location *2		Elevation
				Size & Depth	Zones *1 Perforated	Inches North	Inches West	

*1 What zones or at what depth is the casing perforated?
*2 Measured from the southeast corner of the 7.5 minute topographic map.

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8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

2. Springs

Monitoring Point Number	Elevation	Rate of Flow (gpm)	Date of Measurement	Location*	
				Inches North	Inches West

*Measured from the southeast corner of the 7.5 minute topographic map

E. Do all springs listed have a continuous year-round flow? N/A _____YES _____NO

1. If not, explain _____

F. Other - Describe and locate.

FOR DEPARTMENT USE ONLY:

Proposed monitoring point locations and construction approved:

Name: _____ Date _____

Comments: _____

DATE PREPARED
8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. Number

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

IV. HYDROLOGY (continued)

Name and address of geologist or hydrogeologist supplying the above data:

Name: James A. Humphreville

Street: 211 S. President Avenue

City & State: Lancaster, PA 17603

Phone Number (include area code) (717) 397-1034

Sources of Data:

- Driller's Boring Logs
- Water level measurements in Observation Wells
- Study of Topographic Setting

Comments: (attach additional sheets if necessary)

V. CLIMATOLOGY AND FLOODING

A. Will this be an all-season operation? X YES ____ NO

1. If seasonal, include operating dates: _____ to _____.

B. Precipitation data: For a sanitary landfill requiring collection and treatment of leachate complete 1, 2, 3, 4, 5, & 6.
For impoundments complete 2, 5, & 6.
For sprayback complete 3, 4, 5, & 6.

1. Maximum precipitation — inches/yr. _____
2. Average precipitation — inches/yr. 37.74
3. Maximum monthly precipitation — Month _____ in. _____
4. Minimum monthly precipitation — Month _____ in. _____
5. Station of record York Haven
6. Length of historical record 61 years

DATE PREPARED
8-24-84

DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

V. CLIMATOLOGY AND FLOODING (continued)

C. Flooding Frequency

1. Will all or part of the site be inundated? (check one)

a. ____ once in 5 years or more
b. ____ once in 10 years
c. ____ once in 25 years
d. ____ once in 50 years
e. ____ once in 100 years
f. X never

D. Source of flooding information Site was not flooded during the great flood of June 1972 which is considered to be a flood of greater than a 100-year recurrence interval.

STORAGE OR TREATMENT OF WASTES

VI. IMPOUNDMENTS N/A

Answer the following questions for impoundments only:

A. How will the sides and bottom of the impoundment be made impervious? ____YES ____NO

Briefly describe or explain _____

B. Will the surrounding area be graded or diked to prevent surface water from entering the impoundment?
____YES ____NO

Briefly describe or explain _____

DATE PREPARED
8-24-84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

I. D. NUMBER

SOILS, GEOLOGY AND GROUNDWATER INFORMATION
MODULE NO. 2

PHASE I

IV. IMPOUNDMENTS (continued)

C. Will the sides be constructed to maintain a two (2) foot freeboard, and be protected against wave action?

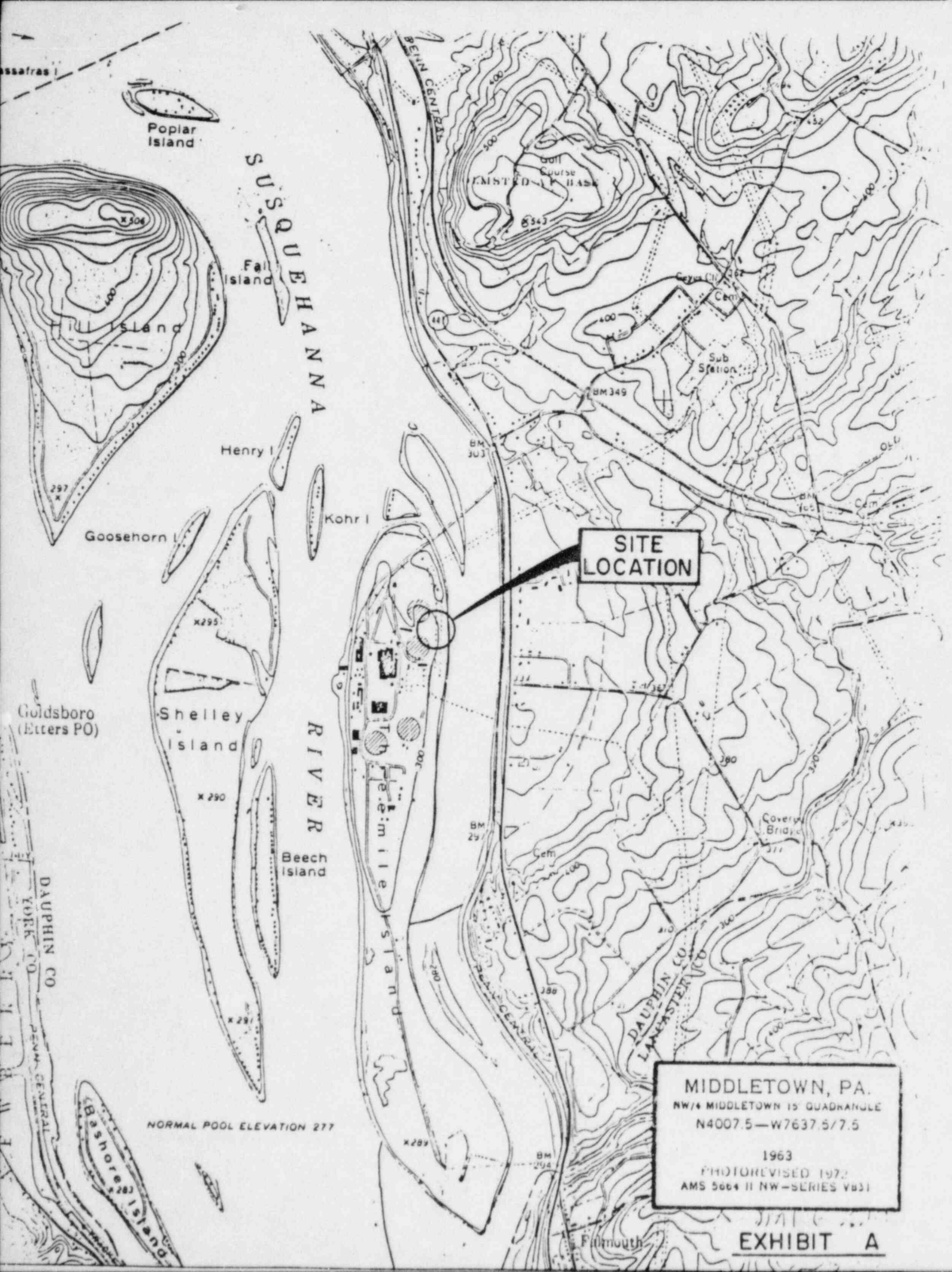
_____YES _____NO

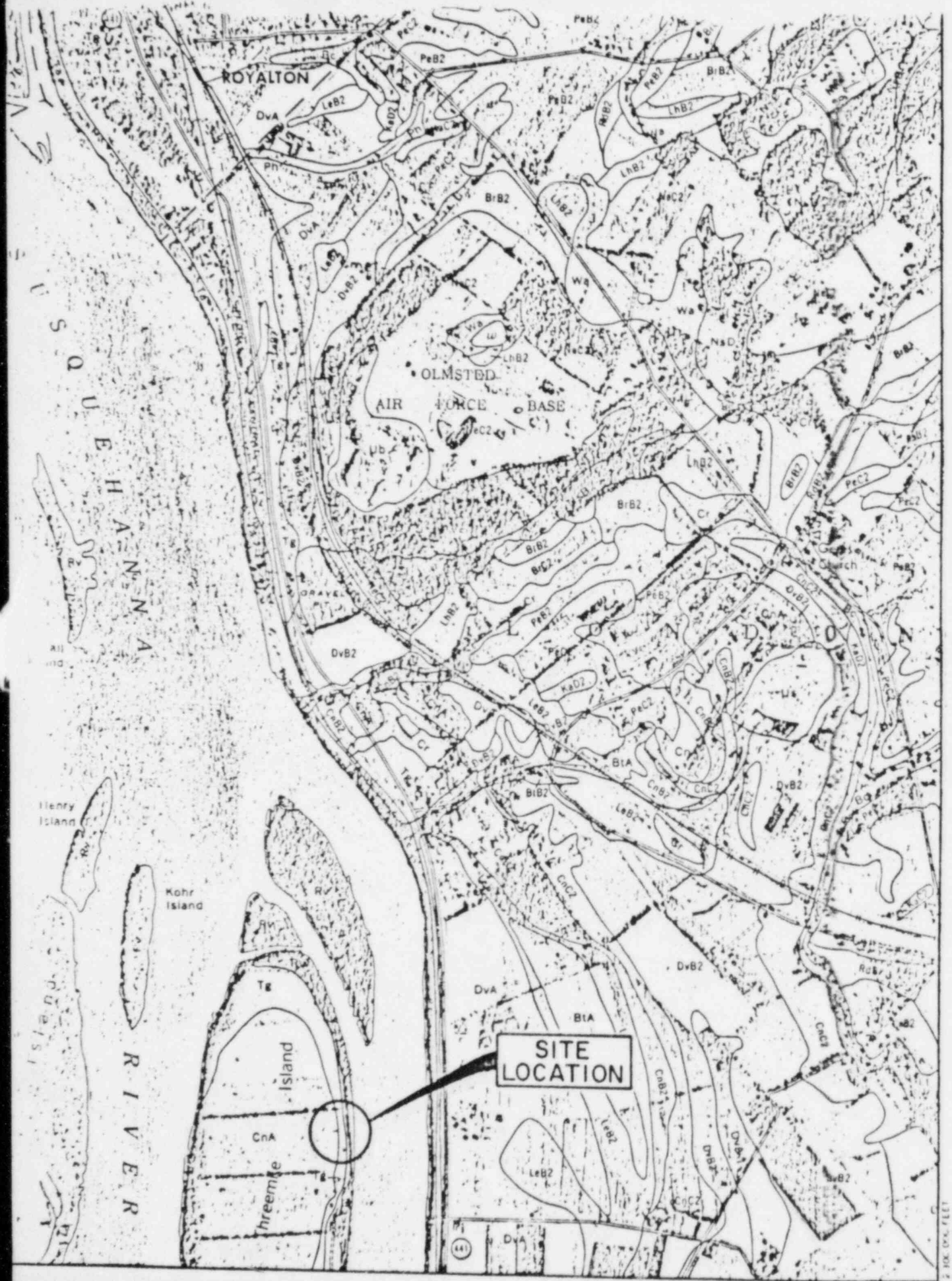
D. How will the impoundment be protected from acts of third parties? _____

_____

E. Provide plans for the vegetation of outside slope.

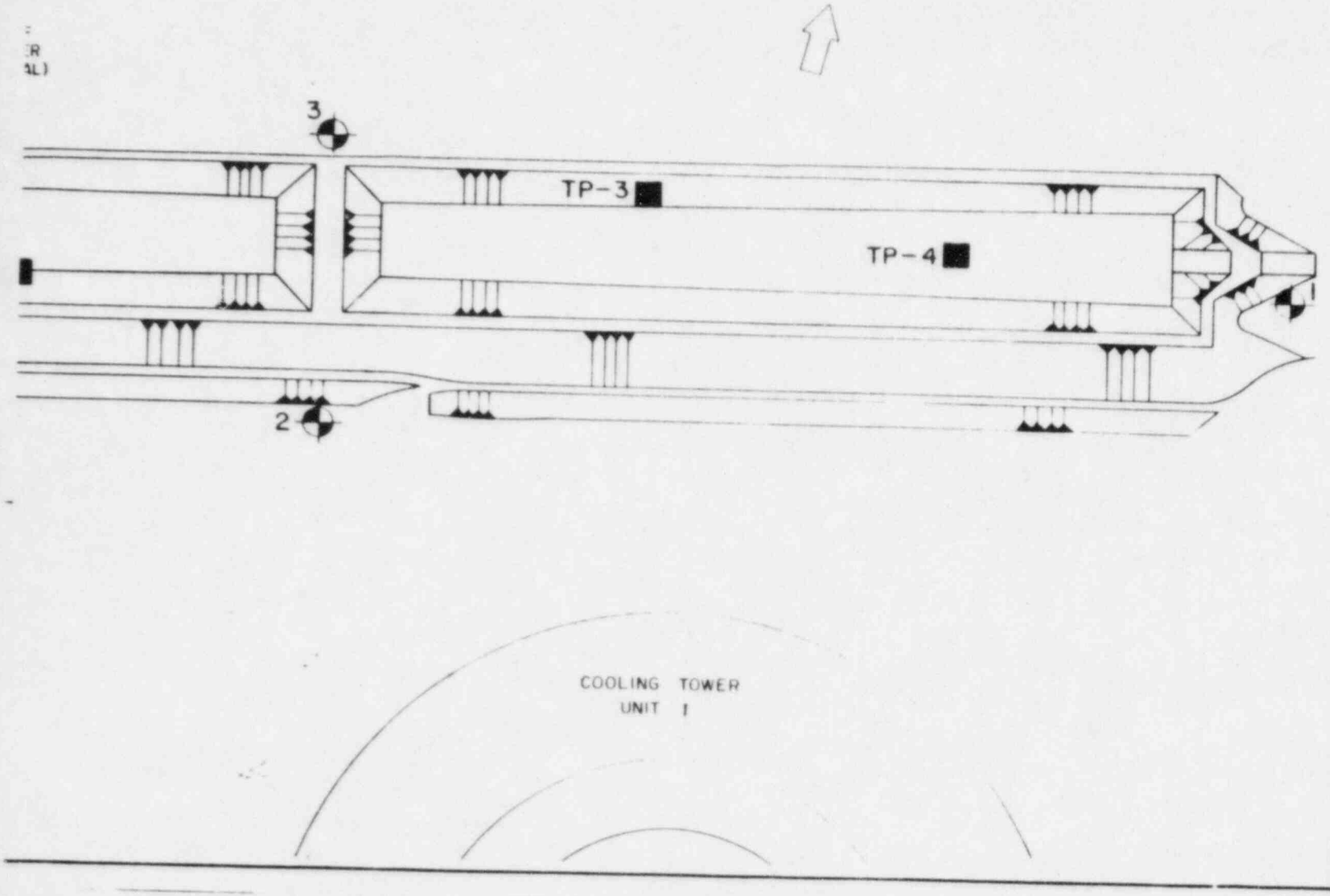
_____YES _____NO


Poplar Island
SUSQUEHANNA RIVER
Fall Island
Henry I
Kohr I
Goosehorn I
SITE LOCATION
Goldsboro (Etters PO)
Shelley Island
Beech Island
Three Mile Island
Golf Course
Sub Station
Cem
BM 349
BM 303
BM 294
Covered Bridge
DAUPHIN CO
YORK CO
PENN CENTRAL
DAUPHIN CO
LANCASTER CO
Bashore Island
NORMAL POOL ELEVATION 277
Falmouth
MIDDLETOWN, PA.
NW/4 MIDDLETOWN 15' QUADRANGLE
N4007.5—W7637.5/7.5
1963
PHOTOREVISED 1972
AMS 5664 II NW—SERIES V831
EXHIBIT A



USDA – SCS MAP

EXHIBIT B



INDICATES TEST BORING

INDICATES TEST PIT

PROPOSED

SOLID WASTE DISPOSAL BASI

THREE MILE ISLAND NUCLEAR PL

MIDDLETOWN , PENNSYLVANIA

BORING AND TEST PIT LOCATION PLAN

F T KITLINSKI & ASSOCIATES ,
Consulting Geotechnical Engineer
Harrisburg , Pennsylvania

SCALE 1" = 50' BY KMK	GPU NUCLEAR CORPORATION MIDDLETOWN , PENNSYLVANIA	

EXHIBIT

LOG OF TEST PITS

Test Pit No.	Depth	Color	Texture	Structure	Consistence	Mottling
1	0"-10"	Grey	Crushed Aggregate	Granular	N/A	N/A
	10"-28"	Brown	Silt/Clayey Silt	Subangular	Firm	None
	· 30-Mil Vinyl Liner (PVC) Encountered at 28".					
2	0"-9¼"	Grey	Crushed Aggregate	Granular	N/A	N/A
	9¼"-36"	Brown	Silt/Clayey Silt	Subangular	Firm	None
	· 30-Mil Vinyl Liner (PVC) Encountered at 36".					
3	0"-9"	Grey	Crushed Aggregate	Granular	N/A	N/A
	9"-33"	Brown	Silt/Clayey Silt	Subangular	Firm	None
	· 30-Mil Vinyl Liner (PVC) Encountered at 33".					
4	0"-9½"	Grey	Crushed Aggregate	Granular	N/A	N/A
	9½"-36"	Brown	Silt/Clayey Silt	Subangular	Firm	None
	· 30-Mil Vinyl Liner (PVC) Encountered at 36".					

EXHIBIT D

REPORT
ON
GEOTECHNICAL ENGINEERING INVESTIGATION
FOR
PROPOSED
SOLID WASTE DISPOSAL FACILITY
GPU NUCLEAR CORPORATION
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA

PREPARED
FOR
GPU NUCLEAR CORPORATION
MIDDLETOWN, PENNSYLVANIA

BY
F. T. KITLINSKI & ASSOCIATES, INC.
Consulting Geotechnical Engineers
Harrisburg, Pennsylvania

August, '984

EXHIBIT E

F. T. KITLINSKI & ASSOCIATES, INC.

CONSULTING GEOTECHNICAL ENGINEERS

FELIX T. KITLINSKI, P. E.

TELEPHONE 717.652.8620

3608 NORTH PROGRESS AVENUE
HARRISBURG, PENNSYLVANIA 17110
(1.2 MILES NORTH OF PROGRESS AVENUE
INTERCHANGE NO. 24 OF I-81)

August 24, 1984

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191

Re: Contract No. TC-015172
Proposed Solid Waste Disposal
Facility
Three Mile Island
Middletown, Pennsylvania

Gentlemen:

In accordance with your request, and as discussed with your office over the last four (4) months, we conducted a geotechnical engineering study of the subsurface and ground-water conditions relative to the use of two (2) existing chemical cleaning basins proposed for use as a disposal facility for site generated industrial filter waste. The revised June 14, 1984 letter proposal of F. T. Kitlinski & Associates, Inc. (superseding an earlier one dated April 20, 1984) outlined the scope of the geotechnical engineering services to be rendered based upon the GPU Nuclear Corporation request for services; and the issue of Contract No. TC-015172, bearing an effective date of July 9, 1984, authorized the physical execution of the work discussed herein.

SCOPE AND PURPOSE

This report presents the results of the field subsurface investigations, laboratory tests, engineering analyses and geological studies that were performed along with our subsequent conclusions relative to the use of the existing chemical cleaning basins which are proposed for use as a disposal facility for site generated industrial waste filter cake.

Basically, the scope of provided services revolved about the following items of work:

A. Provide monitoring services during the conduct of test borings and associated procurement of Shelby-tube undisturbed soil samples, the conduct of in-situ permeability tests in the test borings, and during the installation of piezometers in each boring to monitor the ground-water conditions.

B. Provide monitoring services during the excavation of test pits in the existing basins; and provide for the logging of the strata in the excavated pits and to procure soil samples as required.

C. Make site reconnaissance(s) and site inspections during the test boring and test pit work, such efforts to be by geotechnical engineers and/or a hydrogeologist from F. T. Kitlinski & Associates, Inc.

D. Perform laboratory soil tests in the laboratory of F. T. Kitlinski & Associates, Inc. to determine soil classification,

plasticity, specific gravity, natural moisture, natural density, and permeability of the in-situ soils, both on disturbed and undisturbed soil samples.

E. Prepare Pennsylvania Department of Environmental Resources (DER) Module No. 2, Phase I, "Soils, Geology and Groundwater Information."

F. Prepare in six (6) copies all accumulated field and laboratory data for the assignment along with analyses, discussions and conclusions.

G. Perform ancillary engineering services such as (1) assessment of the existing basin structures, confirmation of existing information of basin structures and profiles, and comparison of this information with existing drawings and specifications; (2) description of gravel and clay liners and description of the PVC liner; (3) determination of the clay liner permeability rate; (4) condition of PVC liner by visual means; and (5) being available for meetings and interfacing with TMINS Site Environmental Licensing Engineer.

EXHIBITS ACCOMPANYING THIS REPORT

Appendix A

- Plate No. 1 - Project Location Plan
- Plate No. 2 - Photographs of Existing Basins and Proposed Disposal Facility
- Plate No. 3 - Boring and Test Pit Location Plan
- Plate Nos. 4, 5 & 6 - Photographs of Test Pits and Existing PVC Vinyl Liners

Appendix B

- Test Boring Logs - Boring Nos. 1 to 4
- Test Pit Logs - Nos. TP-1 to TP-4
- Plate No. 7 - Typical Detail of Piezometer Installation
- Table I - Summary of Observation Well (Piezometer) Readings
- Results of Field Permeability Tests

Appendix C

- Results of Laboratory Soil Tests Covering Mechanical Analysis, Atterberg Limits, Specific Gravity, Natural Moisture Content, Falling Head Permeability and Unit Weight
- Logs of Undisturbed Samples

ACKNOWLEDGEMENTS

Acknowledgement is given to the following drawings and information made available and used in the preparation of this report:

- Technical Specifications for PennDER Phase I, Module 2, Solid Waste Disposal Site Application, Soils, Geologic and Groundwater Information, bearing respective dates of "Prepared By" on 3/29/84; and "Approved By" on 4/2/84.
- Drawing No. D-744-064, dated 1/27/72, as prepared by Gilbert Associates, Inc., Engineers and Consultants of Reading, Pennsylvania, and entitled "Site Improvements - Liquid Waste Basins - Plan and Sections - Three Mile Island Nuclear Station - Metropolitan Edison Company."

- Drawing No. E-744-001, dated 1/5/68, as prepared by Gilbert Associates, Inc., Engineers and Consultants of Reading, Pennsylvania, and entitled "Site Improvements - Plot Plan - Finished Grading - Plant Site - Three Mile Island Nuclear Station - Metropolitan Edison Company."

- Drawing No. E-746-012, dated 5/2/67, as prepared by Gilbert Associates, Inc., Engineers and Consultants of Reading, Pennsylvania, and entitled "Subsurface Exploration - Plot Plan - North End of Island, Test Boring Locations - Three Mile Island - Metropolitan Edison Company."

SITE DESCRIPTION AND PROPOSED FACILITIES

The proposed disposal facilities are represented by two (2) existing chemical cleaning basins which are no longer in service, located along the east side of the island, more or less, at the northern end. Three Mile Island as shown on Plate No. 1 in Appendix A is located in Dauphin County, Pennsylvania roughly 1,500 feet downriver from Middletown and about eight (8) miles downriver from Harrisburg.

The two (2) existing chemical cleaning basins are contiguous to each other in a long dimension basis with their long axes extending in an up and downriver direction.

As noted on Gilbert Associates, Inc. Drawing No. D-744-064, the basins are 425 feet long and 75 feet wide (top of embankment slope to top of embankment slope). The west side of the basin

consists of a 6-foot top width berm followed by a 30-foot-wide downward sloping embankment to the natural ground at roughly elevation 293.0, while the east side consists of a 28-foot-wide upward sloping embankment which crests at the centerline of the existing dike along the Susquehanna River at an elevation of about 307.0. Elevations within the bottoms of the basins range from 293.0 at the outer extremities to 291.0 at the inner extremities vs. top of dike elevations of 300.0 in both cases. Slopes of the basin embankments are 2 horizontal to 1 vertical except for the access roads to the basins which are on a 4 to 1 ratio (horizontal to vertical).

The basins were constructed about 1972 and basically consist of a 30-mil vinyl liner (PVC) bearing on native earth comprised of medium sand and gravel with some silt (material specified to be free of large cobbles and sharp stones). Immediately bearing on the vinyl liner rests a 2-foot-thick zone (normal to the bottoms and slopes) of imported soil on which rests a 9-inch-thick course of crushed stone (PennDOT No. 3A coarse aggregate having a maximum size of 2-1/2 inches). See photographs on Plate Nos. 4, 5 and 6 in Appendix A for details of existing basins.

In addition, each basin has been designed and constructed to be able to be drained via a gravity/pumping system. At the time this study was performed, the basins for all intents and purposes were dry with the exception of some residual water.

As we understand the nature of the proposed facilities, the existing basins are to be used for disposal of site generated industrial filter waste which is a non-hazardous industrial waste residue.

SURVEY OF TEST BORING AND TEST PIT LOCATIONS

The physical layout of all test borings discussed within this report and the determination of ground elevations at such points were performed by forces of the GPU Nuclear Corporation, while the test pit locations were selected by the office of F. T. Kitlinski & Associates, Inc. who also positioned them in the field.

SUBSURFACE EXPLORATIONS

A. Test Borings, Undisturbed Samples, Ground-Water Observation Wells (Piezometers) and Field Permeability

The drilling of the test borings forming a part of this investigation was performed by the Pennsylvania Drilling Company of Pittsburgh, Pennsylvania, under contract to GPU Nuclear Corporation during the period July 9-12, 1984. The borings extended to final depths of 31.0 to 45.0 feet. Test drilling inspection services were provided by F. T. Kitlinski & Associates, Inc. on a resident basis during the entire conduct of the work.

The subsurface exploration program was totally developed by GPU Nuclear Corporation and consisted of four (4) standard drive-sample/core borings. All borings were drilled outside of the existing basins to avoid puncturing the 30-mil vinyl liner (PVC). Refer to Plate No. 3 in Appendix A for location of the test

borings and also to Appendix B for logs of the test boring results. In this case, hollow-stem augers (3-1/4" I.D. x 6-5/8" O.D.) were used to advance the borings. As the borings advanced, soil samples were obtained following the standard penetration test (SPT) method. The SPT consists of driving a two (2)-inch-diameter (O.D.) split spoon sampler 18 inches into the ground using a 140-pound drop hammer falling freely through a distance of 30 inches. The number of blows required to drive the sampler each of three (3) six (6)-inch increments of penetration was recorded on the boring logs. Soil samples were obtained generally at intervals not exceeding 3 to 5 feet and closer in some cases.

In addition to the split-spoon soil sampling operations, four (4) special undisturbed or Shelby-tube soil samples were procured from the test borings. Such samples were obtained by hydraulically pressing three (3)-inch outside-diameter thin-wall steel tubes into the soil under steady pressure, thus extracting them as relatively undisturbed specimens. Immediately following procurement, each sample was preserved by sealing the ends with wax and then returned to the laboratory of F. T. Kitlinski & Associates, Inc. in Harrisburg for detailed review and testing.

As refusal was encountered to the advance of the hollow-stem augers or the soil sampling tools, NXM type and size diamond-coring tools capable of recovering rock cores 2-1/8 inches in diameter were employed to continue the borings. In all cases, the borings were advanced to the bedrock surface and at least ten (10) feet into bedrock.

During the course of executing the boring work, readings were taken at each boring location to determine the presence and level of any ground water. The readings were taken both at the completion of the borings and again in three (3) of the four (4) borings 24 hours later. All of the obtained ground-water readings are presented on the test boring logs in Appendix B, and on Table No. I in the same Appendix.

After completion of the borings, each one was developed into a ground-water monitoring well (piezometer) using 2" I.D. slotted PVC pipe (0.010" slots). The wells were typically installed in accordance with the detail shown on Plate No. 7 in Appendix B. Moreover, all wells project above the ground surface by approximately 3.5 to 4.0 feet and are protected with four (4)-inch I.D. steel pipes with locking caps. See Table No. 1 in Appendix B for observed levels of ground water.

As the borings were advanced, tests were conducted at selected depths to determine the permeability of the in-situ materials forming the subsurface strata. All permeability tests were performed immediately before the split-spoon samples were taken. A constant head was applied during the test by maintaining the water level at the top of the casing by continually adding water. The test period covered three (3) intervals of five (5) minutes each or a total of 15 minutes. The water losses were measured in ounces, quarts, or gallons depending upon the rate of loss.

B. Test Pits

Subsequent to the drilling of the test borings, four (4) shallow-depth test pits were dug within the basins. These pits were manually dug by personnel provided by the GPU Nuclear Corporation and were roughly two (2) feet wide by three (3) feet long. They extended to depths of 28 to 36 inches so as to expose and verify the 30-mil vinyl liner (PVC), in addition to permitting the examination and logging of the materials covering the liner and the lifting of samples for laboratory testing. In a manner similar to the test borings, GPU Nuclear Corporation developed the test pit program and F. T. Kitlinski & Associates, Inc. provided inspection services during the examination process. The test pits were excavated on July 13, 1984 at locations shown on Plate No. 3 in Appendix A; and their results are included in Appendix B. Moreover, Plate Nos. 4, 5 and 6 in Appendix A present photographs of the exposed liner in the pits in addition to showing the nature of the spoil excavated from the pits. All pits were carefully backfilled after they were logged, sampled and photographed.

In addition to the field investigations, site reconnaissances were conducted by Felix T. Kitlinski, Geotechnical Engineer, Soil Scientist and Professional Engineer, of this office on June 19 and July 13, 1984. The June 19 site visit was conducted as a preliminary to the execution of the test boring program while the July 13 site view was conducted while the test pit work was underway at which time logging of the test pits was conducted in conjunction with the resident field inspector from F. T. Kitlinski & Associates, Inc.

LABORATORY TESTS

Following the completion of the field work, laboratory tests were conducted on representative soil samples, both disturbed and undisturbed, procured during the test boring and test pit work.

These tests consisted of ten (10) natural moisture content tests, six (6) grain-size analyses tests (both sieve and hydrometer), six (6) Atterberg limits tests, four (4) specific gravity tests, four (4) unit weight determinations (on Shelby-tube undisturbed samples) and two (2) falling head permeability tests. All tests were conducted in accordance with the latest standards set forth by the American Society for Testing Materials (ASTM). The results of the tests are presented in Appendix C of this report. No tests were conducted on any of the recovered rock cores; however, all rock cores were visually reviewed and classified in detail.

DISCUSSION OF SUBSURFACE CONDITIONS

A. Native Deposits

1. Soil Series and Phases

As indicated on the USDA-SCS Soil Map appended to the Ground Water Module as Exhibit B, the native soil series and phases found at the project site are L_w and T_g. The L_w symbol represents the Lindside silt loam-coal overwash, while the T_g symbol represents the Tioga fine sandy loam. The Lindside series is described in "Soil Survey, Dauphin County, Pennsylvania", as prepared by the USDA-SCS (1972), as deep, mostly level, moderately well-drained silt loam soils

on flood plains subject to flooding and having thicknesses ranging up to 60 inches. The coal overwash on the surface is as much as seven (7) inches thick. The Tioga fine sandy loam, high bottom, is nearly level and occurs on high bottoms of low stream terraces that normally are above flood waters. Additionally, the Tioga series consists of deep, nearly level, well-drained soils on flood plains and high bottoms along the Susquehanna River and Swatara Creek formed in alluvial deposits from various rocks such as sandstones, limestones and shales. The subsoil extends to a depth of 60 inches or more. Furthermore, the subsoils are rated as having moderate permeability, rapid internal drainage and moderate available moisture capacity.

Samples of the Tioga series are considered to have been obtained from the borings, thus correlation of the soil is possible in this case.

2. Grain Size and Plasticity Characteristics

Four (4) samples of the overburden were subjected to laboratory classification tests to determine their grain size and plasticity characteristics. The results of these tests are presented in Appendix C of this report. According to the Unified Soil Classification System (USCS), two (2) samples have a CL-ML symbol, one (1) a SM symbol and one (1) a GP-GM symbol. The CL-ML symbol denotes a dual classification consisting of inorganic silts and very fine sands and clays of

low to medium plasticity, whereas the SM symbol denotes silty sand. The GP-GM symbol also denotes a dual classification consisting of poorly-graded gravel, silty gravels and gravel-sand-silt mixtures.

3. Natural Density and Natural Moisture

The four (4) undisturbed soil samples were tested for their unit weight and moisture content. In addition, two (2) disturbed samples were tested for natural moisture content. These tests indicate natural dry density values ranging from 89.2 to 99.7 p.c.f. (pounds per cubic foot) and natural moisture contents ranging from 4.4 to 19.5 percent, averaging 13.0 percent.

4. Soil Permeability

Eight (8) field in-situ permeability tests and two (2) laboratory falling head permeability tests were performed within or on the overburden deposits. The results of the field tests revealed variable rates of percolation. In some cases, virtually no percolation or "water take" was experienced, while in other cases a measurable percolation rate was established. For the most part, the in-situ tests indicate a permeable to a fairly impermeable natural condition. As noted by the soil permeability tests results in Appendix B, the coefficient of permeability, k, ranges from 1.28×10^{-3} cm/sec to 6.96×10^{-5} cm/sec. The laboratory tests on the undisturbed samples disclosed coefficients of permeability of 5.30×10^{-4} cm/sec and 1.98×10^{-4} cm/sec.

5. Overburden Thickness

The overburden thickness at the project site is very uniform, the exception being at the location of Boring No. 3 where the soil thickness is 14 feet greater than the other three (3) borings - this condition is solely due to the boring being drilled on the top of the river dike which is some 14 feet higher than the surrounding area. As noted on the boring logs in Appendix B, the overburden thickness is 21.0 feet at Boring No. 1, 21.0 feet at Boring No. 2, 35.0 feet at Boring No. 3 and 21.2 feet at Boring No. 4. (These depths include the highly weathered bedrock zone where present which form a part of the bedrock strata and which were penetrated by the soil sampling tools.) In terms of elevation, the bases (contact with the bedrock surface) of the overburden varies from elevation 271.2 to 273.5, averaging 272.3.

6. Bedrock

The project site falls in the Triassic Lowland Section of the Piedmont Physiographic Province. The bedrock in this area is related to the Gettysburg formation which is a member of the Newark Group of sedimentary rocks. On a regional basis, the Gettysburg is described as thick red shale interbedded with soft red sandstone.

In all four (4) test borings, the bedrock was encountered and cored for depths of at least ten (10) feet. The depth to bedrock ranges from 21.0, 21.0 and 21.2 feet respectively

at Boring Nos. 1, 2 and 4; and at a depth of 35.0 feet at the location of Boring No. 3. However, on an elevation basis, the bedrock surface is very level ranging from 271.2 to 273.5, averaging 272.3. Moreover, all four (4) borings confirmed the presence of the Gettysburg formation inasmuch as red shale was encountered and cored in all cases.

7. Ground Water

The ground-water table, as disclosed by the test borings and observation wells, was at a level (July, 1984) 13.3± feet (Boring No. 1) to 28.0 feet (Boring No. 3) below existing grade, but averaging elevation 279.7±. The 28.0-foot depth is due to the increased elevation of the surface of the boring and established observation well which accounts for the approximately 14.0-foot of elevation differential.

B. Man-Made Subsurface Conditions Within Existing Basins

The four (4) test pits excavated in the existing basins generally confirm the design and configuration of the basins. All four (4) pits encountered the 30-mil vinyl liner (PVC) at depths of 28 to 36 inches. Immediately overlying the liner lies a course of well compacted, medium to hard, slightly plastic, brown fine silt/clayey silt which classifies as CL-ML according to the USCS terminology and based on the two (2) laboratory tests. This course of material ranges in thickness from 18 to 26-3/4 inches, averaging 23-1/2± inches. Test Pit No. 2 is the only pit which disclosed a soil thickness less than the design thickness of 24 inches. Represented as a surface course, and overlying the CL-ML soil zone, exists

a well-graded, durable crushed limestone aggregate course ranging in thickness from 9 inches to 10 inches (as opposed to a design thickness of 9 inches). This aggregate is classified as PennDOT No. 3A coarse aggregate and possesses grading characteristics as follows:

Sieve Size	Total Percent Passing
2-1/2"	100
2"	90 - 100
1-1/2"	35 - 70
1"	0 - 15
1/2"	0 - 5

As judged by visual inspection on July 13, 1984, the vinyl liner is in excellent condition after approximately 12 years of service. This quality can, in part, be seen by viewing the photographs contained as Plate Nos. 4, 5 and 6 in Appendix A. Moreover, a snip of the liner was procured from the tucked-in tail end on the upslope edge of one of the basins for further visual laboratory review. This additional review confirms the liner to be in good to excellent condition and to be of 30-mil thickness as determined by a micrometer.

SUMMARY AND CONCLUSIONS

Based upon the evaluation of all available data generated as a part of this investigation and study, the following summary and conclusions are presented:

A. For the most part, the overburden at the project site is 21.0± feet thick and extends to elevation 272.3. The exception to thickness is at the location of Boring No. 3 where the soil thickness is 35.0 feet due to an increased elevation of 14.0 feet at the test boring point.

B. Bedrock is present at depths of 21.0 to 35.0 feet below the existing ground surface and rather uniformly exists at elevation 272.3±.

C. Ground water is present (July, 1984) at depths of 13.3 to 28.0 feet below the existing ground surface and prevails at a very uniform elevation of 279.4 to 280.1. These levels, more or less, match the level of the Susquehanna River which is some 150 to 200 feet away to the east; and considering the stages of the river at various times will fluctuate according to the river elevations, such fluctuations to be almost instantaneous due to river proximity and the permeability of the soil strata.

D. The native soil deposits are heterogeneous and range from slightly plastic to non-plastic CL-ML to SM to GP-GM types according to the Unified Soil Classification System; and the bedrock without exception, within the depth limits explored, is reddish-brown shale which chiefly is in a soft to medium hard state.

E. Although all the test borings were drilled outside the immediate limits of the existing basins, there is no reason to believe that the subsurface strata beneath the basins, i.e. below the liner, are any different than those disclosed by the borings.

F. The coefficient of permeability, k, of the native soil deposits as disclosed by the in-situ field permeability tests ranges from 1.28×10^{-3} cm/sec to 6.96×10^{-5} cm/sec; while the permeability as revealed by the laboratory tests on two (2) Shelby-tube undisturbed samples indicates "k" factors of 5.30×10^{-4} cm/sec and 1.98×10^{-4} cm/sec.

G. The test pits results and visual reviews indicate the existing basins are substantially constructed in accordance with the design, i.e. the topmost zone of the bottoms and side slopes are comprised of a 9-inch-thick crushed aggregate surface course beneath which lies a layer of fine-grained, slightly plastic, silt/clayey silt which is basically two (2) feet in thickness, the exception being at the location of Test Pit No. 1 where it was disclosed to be 18 inches thick. At the base of the soil layer exists the 30-mil PVC liner. The fine-grained soil classifies as CL-ML type which indicates clayey silt/silt soils. No in-situ permeability tests were conducted in the soil zone overlying the PVC liner because any such tests should be considered academic in this case because of the underlying 30-mil PVC liner. Nevertheless,

the soil zone is judged to have a "k" factor of 10^{-4} to 10^{-5} cm/sec based upon its in-situ density and character.

H. The 30-mil vinyl liner (PVC) was intercepted in all four (4) test pits and in a number of areas at the top of the basin slopes where it is well tucked in and secured in the soil on a double fold basis. In all test pits, the PVC liner was disclosed to be sound and well positioned and in a good to excellent state of preservation. A snip taken from a runout at the top of the basin slope was further examined in the laboratory for its quality which also revealed a good to excellent state. In addition, the thickness of the liner was verified to be 30 mils by use of a micrometer.

I. The coefficient of permeability of the 30-mil PVC liner was not physically determined because of its basic imperviousness; however, available literature indicates the Water Vapor Transmission characteristics (WVTR) of such a liner will have a very low rating to the degree that it can be considered as virtually impervious inasmuch as transmissibility would be in the range of 3.8 gms/mil/day/100 sq. in. (Dow Chemical Company rating). Such a permeability rate should easily satisfy DER's liner requirement of 1×10^{-7} cm/sec or less as specified in their "Chapter 75, Solid Waste Management Rules and Regulations."

J. Weighing up all accumulated information, it appears very reasonable to assume a position that there will be virtually

no communication between the basins and the ground-water table, other than water vapors which might permeate the liner.

K. As a whole, the basins are rated to be in good to excellent condition with some crushed aggregate repairs being made during July to correct some slope washouts created by "trainee/practicing fire fighters". The repair zones can be seen by viewing the photographs forming Plate No. 2 in Appendix A.

In final summary, it is concluded that the natural soil conditions are favorable for the proposed solid waste disposal facility and that the existing basins compare favorably with the design drawings and specifications in all respects insofar as configuration, profile, gravel and clay liners, and the 30-mil vinyl liner (PVC). Furthermore, it is the opinion of this office that quality effort was provided as a part of the construction of basins in 1972 and that only a minimal amount of deterioration has taken place since that time.

We will be pleased to explain or amplify our studies at any time if you so request.

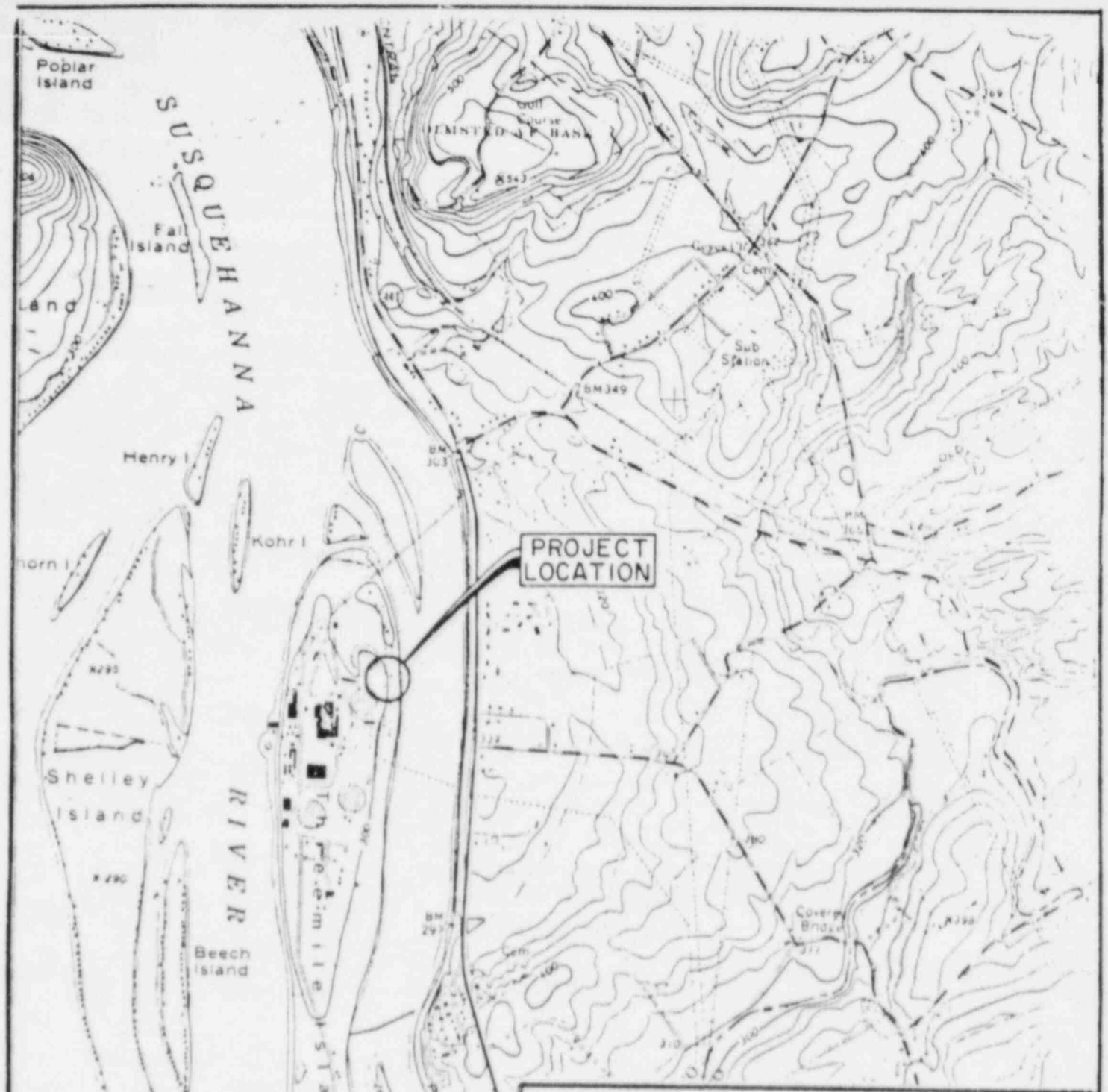
Very truly yours,

F. T. KITLINSKI & ASSOCIATES, INC.

Felix T. Kitlinski, P.E.

APPENDIX A

- Plate No. 1 - Project Location Plan
- Plate No. 2 - Photographs of Existing Basins and Proposed Disposal Facility
- Plate No. 3 - Boring and Test Pit Location Plan
- Plate Nos. 4, 5 and 6 - Photographs of Test Pits and Existing PVC Vinyl Liners



PROPOSED

SOLID WASTE DISPOSAL BASINS

THREE MILE ISLAND NUCLEAR PLANT

MIDDLETOWN , PENNSYLVANIA

PROJECT LOCATION PLAN

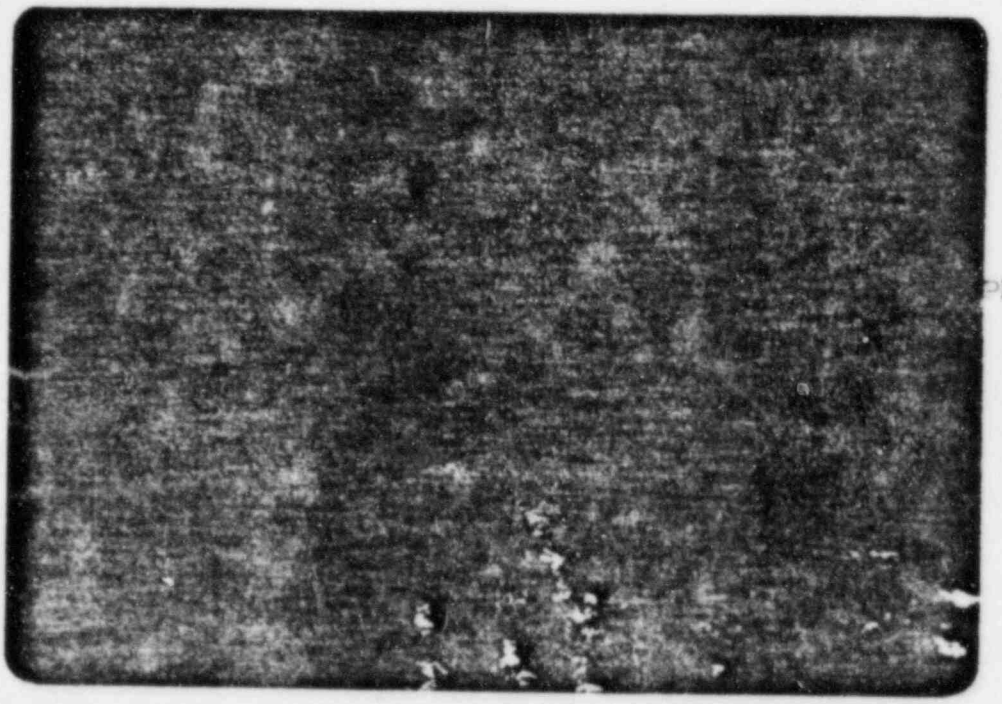
F. T. KITLINSKI & ASSOCIATES , INC.

Consulting Geotechnical Engineers

Harrisburg , Pennsylvania

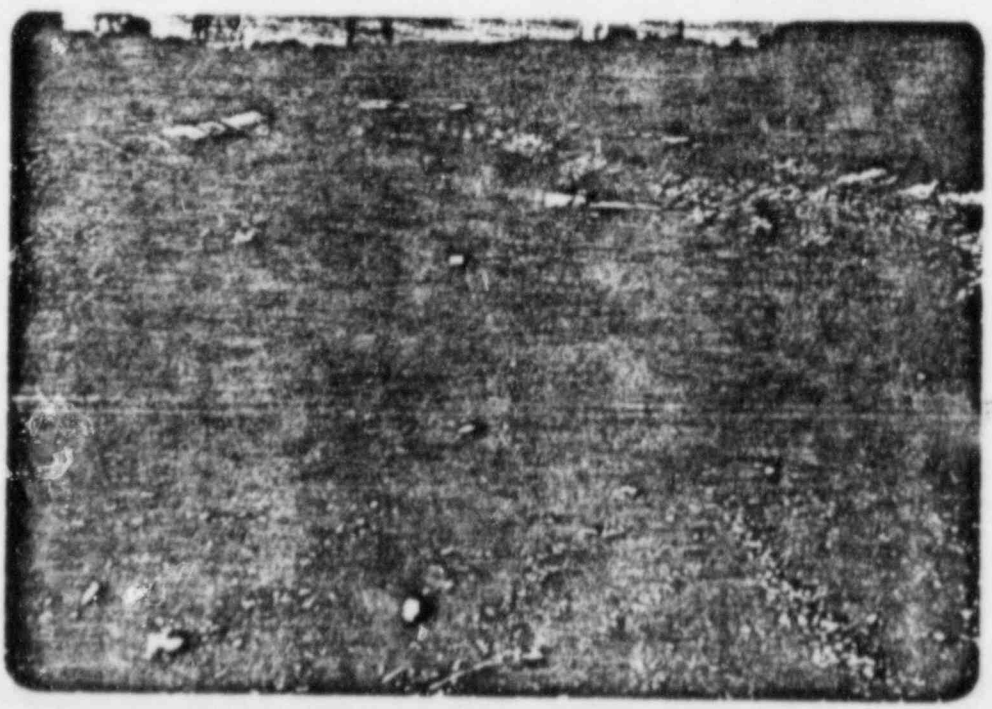
SCALE		DATE
1" = 2000' BY GAA	GPU NUCLEAR CORPORATION MIDDLETOWN , PENNSYLVANIA	AUG , 1984 PLATE NO 1

PROPOSED SOLID WASTE DISPOSAL FACILITY
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA



PHOTOGRAPH A

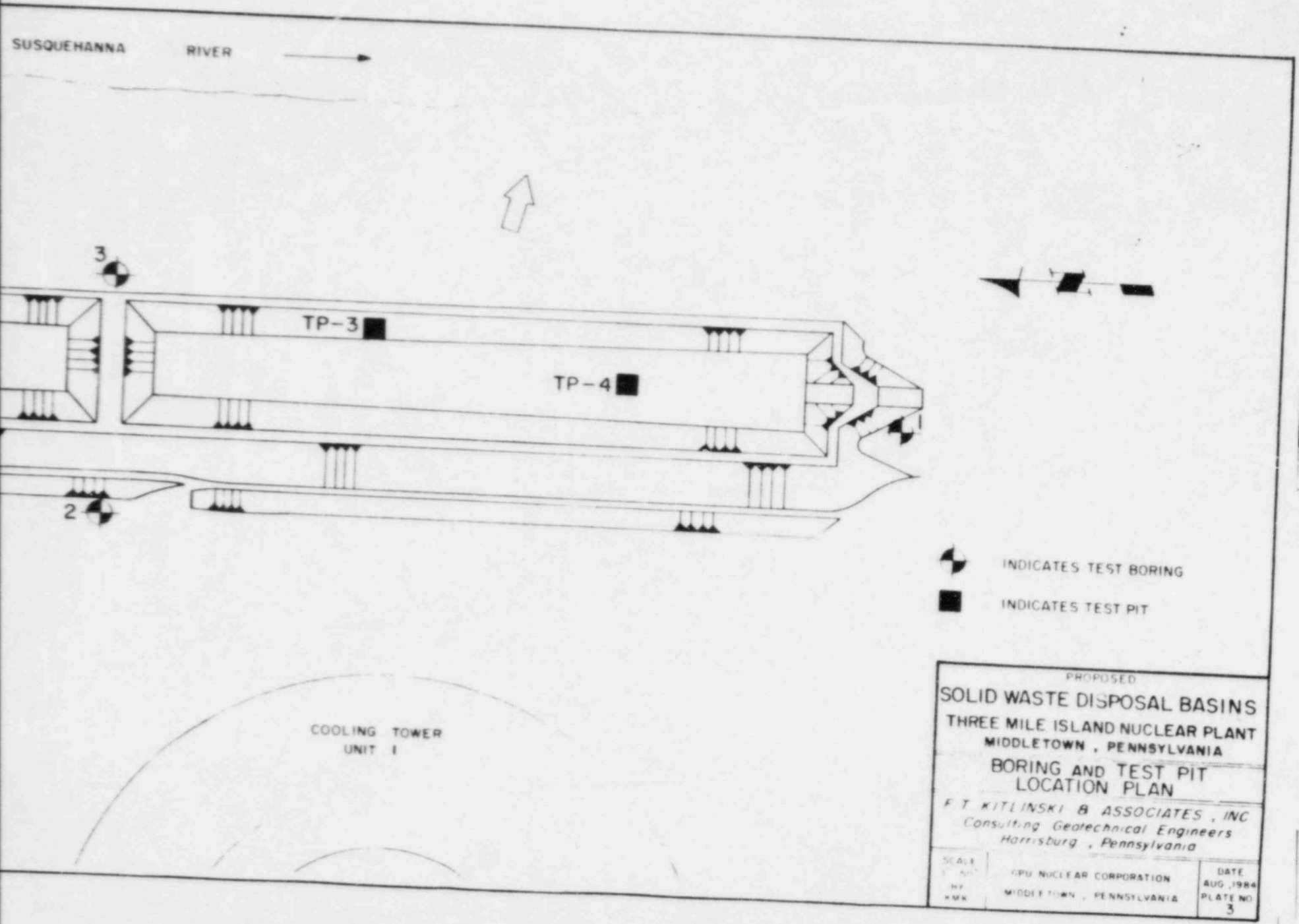
View of Existing "A" Basin
(Upriver One) Looking North



PHOTOGRAPH B

View of Existing "B" Basin
(Downriver One) Looking North

PLATE NO. 2



PROPOSED

SOLID WASTE DISPOSAL BASINS

THREE MILE ISLAND NUCLEAR PLANT

MIDDLETOWN , PENNSYLVANIA

BORING AND TEST PIT LOCATION PLAN

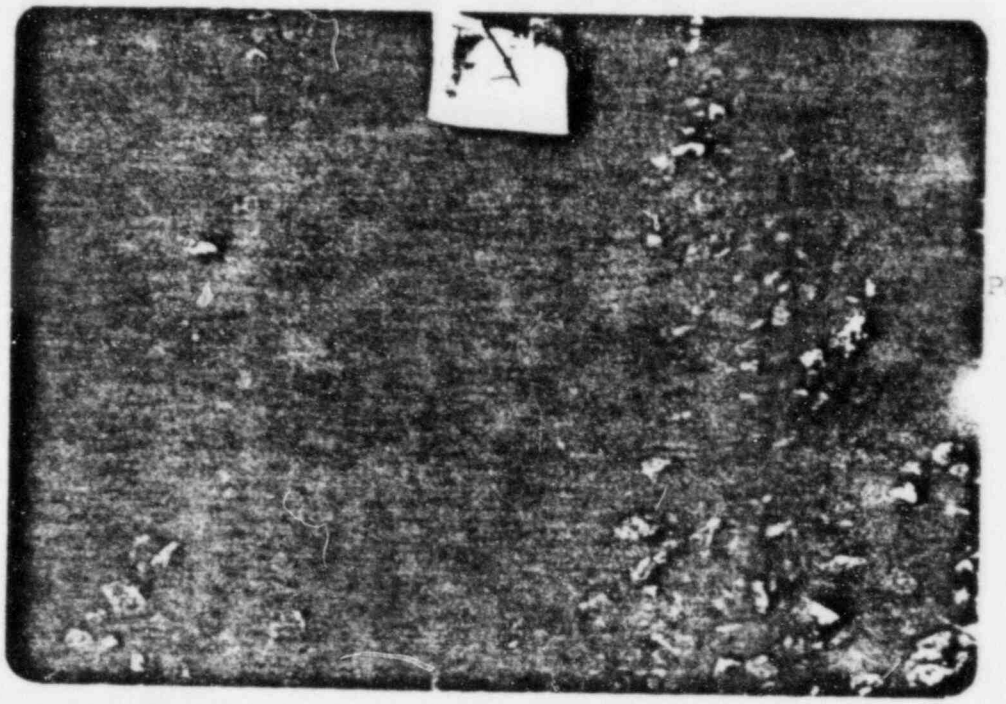
F T KITLINSKI & ASSOCIATES , INC

Consulting Geotechnical Engineers

Harrisburg , Pennsylvania

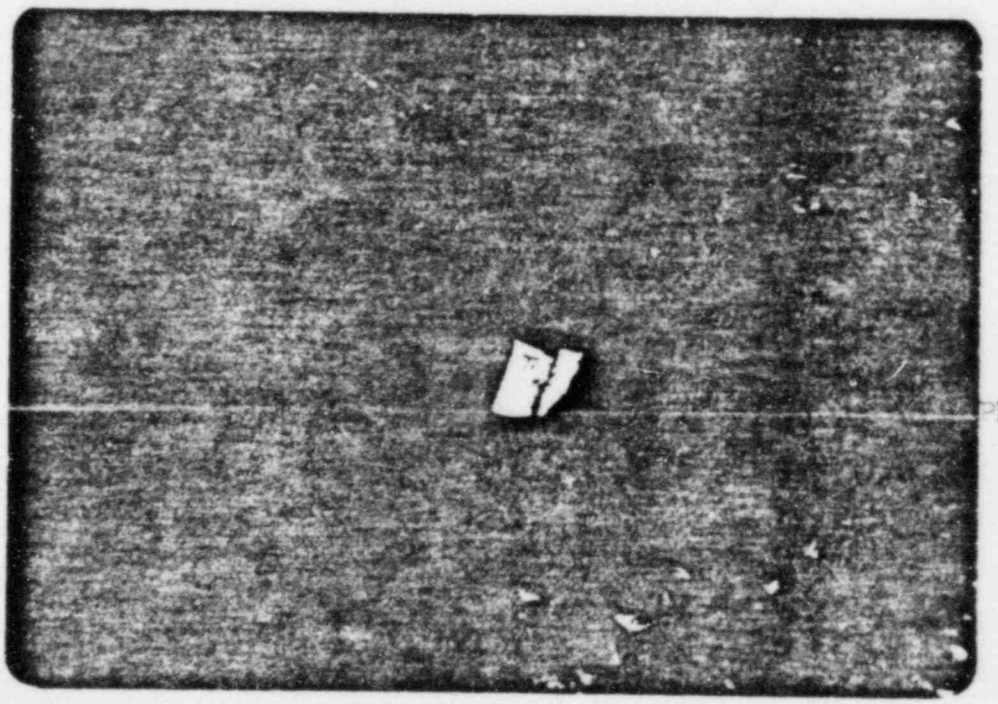
SCALE		DATE
BY KMK	GPU NUCLEAR CORPORATION MIDDLETOWN , PENNSYLVANIA	AUG ,1984 PLATE NO 3

PROPOSED SOLID WASTE DISPOSAL FACILITY
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA



PHOTOGRAPH C

View of Test Pit No. 1
Showing PVC Vinyl Liner and Pit Sidewalls

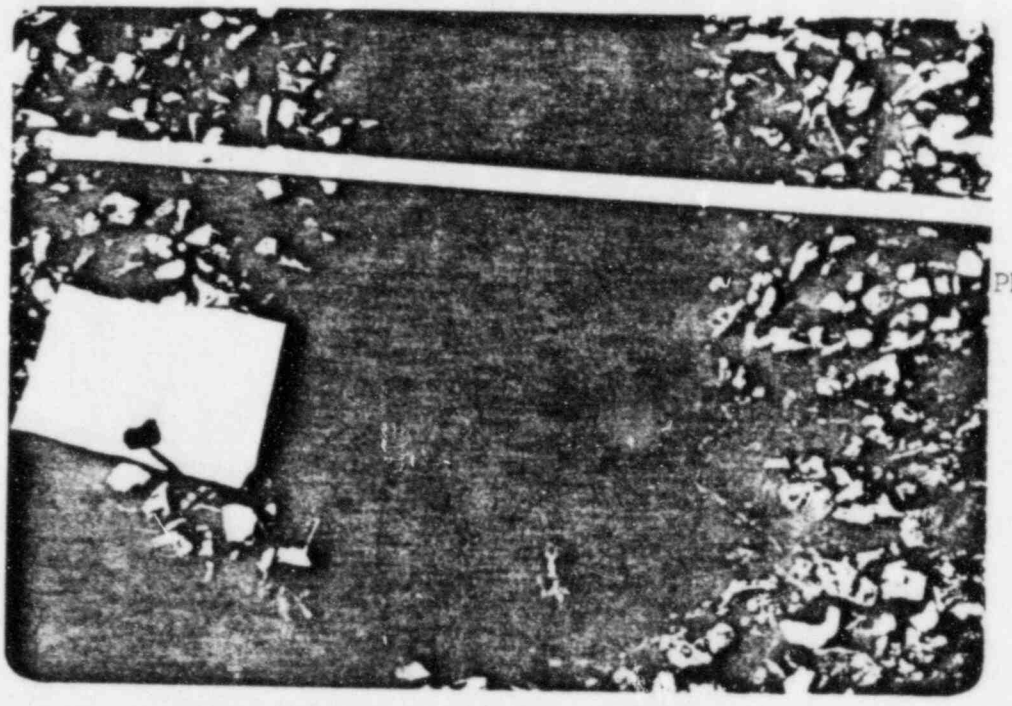


PHOTOGRAPH D

View of Excavated Spoil
from Test Pit No. 1; and
Surrounding Aggregate Surface Course

PLATE NO. 4

PROPOSED SOLID WASTE DISPOSAL FACILITY
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA



PHOTOGRAPH
E

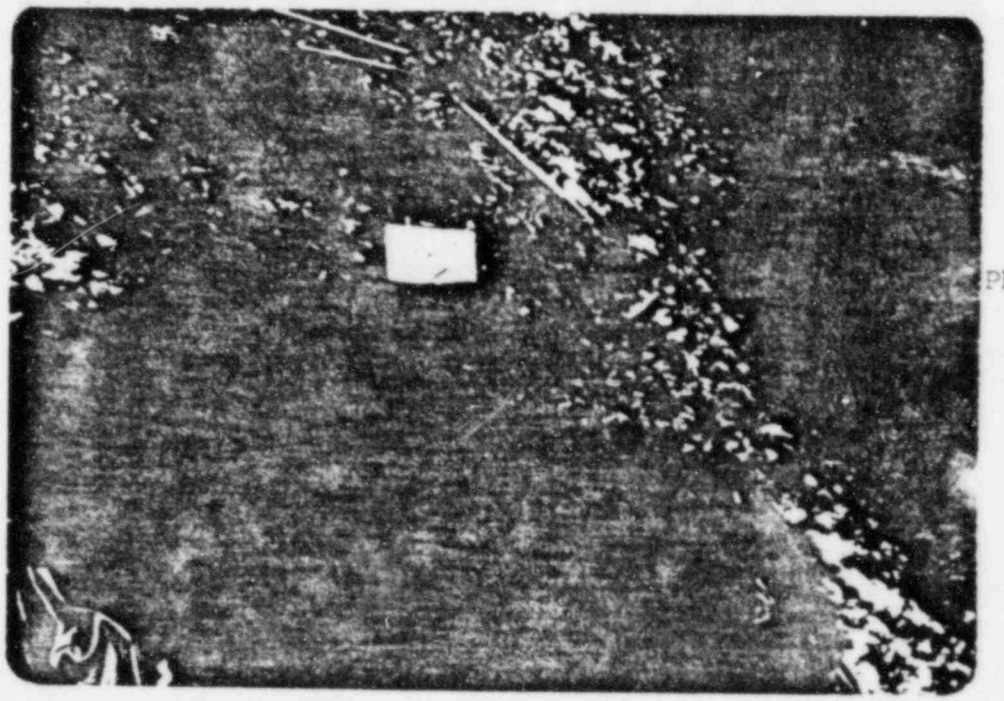
View of Test Pit No. 2 Showing
PVC Vinyl Liner, Pit Sidewalls and
Surrounding Aggregate Surface Course

PHOTOGRAPH
F

View of Test Pit No. 3 on
Side Slope Showing PVC Vinyl
Liner and Pit Sidewalls

PLATE NO. 5

PROPOSED SOLID WASTE DISPOSAL FACILITY
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA



PHOTOGRAPH G

View of Excavated Spoil
from Test Pit No. 3

PHOTOGRAPH H

View of Test Pit No. 4 Showing PVC Vinyl Liner,
Pit Sidewalls and Surrounding
Aggregate Surface Course

PLATE NO. 6

APPENDIX B

- Test Boring Logs - Boring Nos. 1 to 4
- Test Pit Logs - Nos. TP-1 to TP-4
- Plate No. 7 - Typical Detail of Piezometer Installation
- Table I - Summary of Observation Well (Piezometer) Readings
- Results of Field Permeability Tests

PENNSYLVANIA DRILLING COMPANY — TEST BORING RECORD

PITTSBURGH, PA. 15220

Driller James McCann
Water Level
1 hr. 8.8 24 hrs. 11.2
Casing Hammer Wt. ..... lbs. Drop ..... in.
Sampler Hammer Wt. 140 lbs Drop 30 in.
Sampler Size 2 in. O. D. Casing Size 4 in.

Hole No. 1 Surface Elevation ..... Sheet 1 of 1
For GPU Nuclear Corporation
Location Three Mile Island
Started 7/10/84 Completed 7/10/84 Job No. 84106-1

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☒ / Geologist's Log ☐ / Mechanical Analysis ☐	Remarks	Sample Depth	Blows / 6" Penetration on Sampler
	0.0					
			6.0' Brown Sand & Gravel		1.5	3-7-15
	6.0				4.5	10-12-14
			4.0' Brown Sandy Silt			
	10.0				9.5	3-4-7
			9.5' Brown Sand & Gravel with Big Gray Gravel - 12.0' to 19.0'	Rec. ☒ 0.5'	12.5 / 13.5	
					15.5	5-12-26
	19.5					
			1.5' Red Weathered Clay Shale		19.5	7-18-20
	21.0				21.0	
				Core Rec. 83%		
					24.0	
			10.5' Medium Hard Red silty Shale with Clay Seams			
	31.5			97%		
					31.5	

[X] = Shelby Tube Sample

1 - Screen, 10.0'
25.5' of 2" PVC Pipe
1 - Hole Cover

Test - 8.0' - 5 Min. 82 Oz.
5 Min. 80 Oz.
5 Min. 96 Oz.

14.0' - 5 Min. 10 Oz.
5 Min. 8 Oz.
5 Min. 8 Oz.

PENNSYLVANIA DRILLI ; COMPANY **TEST ORING RECORD**

PITTSBURGH, PA. 15220

Driller ....James McCann

Water Level _____

1 hr. 9.1 24 hrs. 11.0

Casing Hammer Wt. .....lbs. Drop.....in.

Sampler Hammer Wt. 140 lbs Drop 30 in.

Sampler Size 2 in. O. D. Casing Size 4 in.

Hole No. 2 Surface Elevation ..... Sheet 1 of 1

For .....GPU Nuclear Corporation.....

Location .....Three Mile Island.....

Started 7/10/84 Completed 7/10/84 Job No. 84106-1

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☒ / Geologist's Log ☐ / Mechanical Analysis ☐	Remarks	Sample Depth	Blows & Penetration on Sampler
	0.0					
					1.5	15-21-19
					4.6	6-50/.1'
			19.0' Very Hard Brown Sandy Gravel - Big Gravel 9.0 to 19.0'			
					9.5	22-39-69
					14.0	6-11-14
	19.0				18.5	13-16-19
	21.0		2.0' Red Clay Shale		21.0	
				Core Rec.		
			10.0' Hard Red Silty Shale with Clay Seams	68%	26.0	
	31.0			84%	31.0	
			1 - Screen, 10.0' 23.5' of 2" PVC Pipe 1 - Hole Cover			
			Test - 8.0' - 5 Min. 93 Oz. 5 Min. 95 Oz. 5 Min. 108 Oz.			
			14.0' - 5 Min. 83 Oz. 5 Min. 75 Oz. 5 Min. 70 Oz.			

PENNSYLVANIA DRILL[illegible]G COMPANY — TEST [illegible]ORING RECORD

PITTSBURGH, PA. 15220

Driller ....James McCann.....
Water Level _____
1 hr. 26.2 24 hrs. _____
Casing Hammer Wt. _____ lbs. Drop _____ in.
Sampler Hammer Wt. 140 lbs Drop 30 in.
Sampler Size 2 in. O. D. Casing Size 4 in.

Hole No. 3 Surface Elevation _____ Sheet 1 of 1
For GPU Nuclear Corporation
Location Three Mile Island
Started 7/11/84 Completed 7/12/84 Job No. 84106-1

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☒ / Geologist's Log ☐ / Mechanical Analysis ☐	Remarks	Sample Depth	Blows /6" Penetration on Sample
	0.0				1.5	6-9-22
					6.0	1-14-25
			20.0' Very Stiff Brown Silty Clay			
					10.5	12-16-24
					15.0	15-20-24
					18.0	
				☒ Rec. 1.9'		
	20.0				20.0	
			5.0' Brown Sandy Silt		21.5	5-6-8
	25.0				24.0	
				☒ Rec. 1.5'		
					26.0	
			9.0' Brown Sandy Gravel		27.5	21-28-28
	34.0				34.5	31-42-48
					35.0	
				Core Rec.		
			11.0' Soft to Medium Hard Red Silty Shale	68%	40.0	
	45.0			100%	45.0	
				Test 24.0'	- 5 Min.	20 Oz.
			[X] = Shelby Tube Sample		5 Min.	16 Oz.
					5 Min.	8 Oz.
			1 - Screen, 10.0'	28.0'	- 5 Min.	104 Oz.
			39.0' of 2" PVC Pipe		5 Min.	72 Oz.
			[illegible]ole Cover			

PENNSYLVANIA DRILLI ; COMPANY — TEST ORING RECORD

PITTSBURGH, PA. 15220

Driller James McCann
Water Level
1 hr. 10.0 24 hrs. 12.2
Casing Hammer Wt. ..... lbs. Drop ..... in.
Sampler Hammer Wt. 140 lbs Drop 30 in.
Sampler Size 2 in. O. D. Casing Size 4 in.

Hole No. 4 Surface Elevation ..... Sheet 1 of 1
For GPU Nuclear Clorporation
Location Three Mile Island
Started 7/11/84 Completed 7/11/84 Job No. 84106-1

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☒ / Geologist's Log ☐ / Mechanical Analysis ☐	Remarks	Sample Depth	Blows & Penetration on Sampler
	0.0					
			2.5' Brown Sand & Gravel			
	2.5				1.5	3-7-24
			3.5' Brown Sandy Silt	☒ Rec. 2.0'	3.5	
	6.0				5.5	
					7.0	3-5-15
					9.5	12-20-48
			13.5' Dense Brown Sand, Gravel Big Gravel 9.0' to 17.6'		14.0	20-21-29
	19.5					
	21.2		1.7' Red Clay Shale		19.5	26-41-56
					21.2	
				Core Rec.		
			10.3' Medium Red Silt Shale	72%		
					26.2	
	31.5			96%	31.5	

[X] = Shelby Tube Sample

1 - Screen, 10.0'
24.5' of 2" PVC Pipe
1 - Hole Cover

Test - 8.0' - 5 Min. 32 Oz.
5 Min. 23 Oz.
5 Min. 36 Oz.

14.0' - 5 Min. 2 Oz.
5 Min. 2 Oz.
5 Min. 2 Oz.

F. T. KITLINSKI & ASSOCIATES
Harrisburg, Pennsylvania

TEST PIT LOG

For GPU Nuclear Corporation, Middletown, PA Project No. 84-06-3710
Job Name and Location Prop. Solid Waste Disposal Facility, 3-Mile Island, Middletown, PA
Test Pit Nos. 1 & 2 Pit Exc. Method: By Hand By: GPU

Test Pit No. 1 Date 7-13-84
Location Basin "A" (Per Location Plan)
Ground Elevation 292.5±
Ground Water Elevation None
Depth of Test Pit 28"

Log (in.)	Material and Remarks	Sample No.	Sample Depth
0" / 10"	Crushed limestone aggregate		
10" / 28"	Brown fine silt/ clayey silt - moist - compact - no coarse fragments - encountered PVC vinyl liner at 28"	1 Bag	10" to 28"
	End of Test Pit at 28"		
	Pit dug by hand with dimensions of 18" W x 36" L in center of basin floor		

Test Pit No. 2 Date 7-13-84
Location Basin "A" (Per Location Plan)
Ground Elevation 293.0±
Ground Water Elevation None
Depth of Test Pit 36"

Log (in.)	Material and Remarks	Sample No.	Sample Depth
0" / 9¼"	Crushed limestone aggregate		
9¼" / 36"	Brown fine silt/ clayey silt - moist - compact - no coarse frags. - encountered PVC vinyl liner at 36"	1 Bag	9¼" to 36"
	End of Test Pit at 36"		
	Pit dug by hand with dimensions of 24" W x 36" L on west slope 3½'± up from toe of basin		

General Remarks

Inspector David L. VanOrder Resident Engineer

F. T. KITLINSKI & ASSOCIATES
Harrisburg, Pennsylvania

TEST PIT LOG

For GPU Nuclear Corporation, Middletown, PA Project No. 84-06-3710

Job Name and Location Prop. Solid Waste Disposal Facility, 3-Mile Island, Middletown, PA

Test Pit Nos. 3 & 4 Pit Exc. Method: By Hand By: GPU

Test Pit No. 3 Date 7-13-84

Location Basin "B" (Per Location Plan)

Ground Elevation 293.0±

Ground Water Elevation None

Depth of Test Pit 33"

Log (in.)	Material and Remarks	Sample No.	Sample Depth
0" / 9"	Crushed limestone aggregate		
9" / 33"	Brown fine silt/ clayey silt - moist - compact - no coarse fragments - encountered	1 Bag	9" to 33"
	PVC vinyl liner at 33"		
	End of Test Pit at 33"		
	Pit hand dug with dimensions of 30" W x 42" L		
	on east slope 3½± up from toe of basin		

Test Pit No. 4 Date 7-13-84

Location Basin "B" (Per Location Plan)

Ground Elevation 292.5±

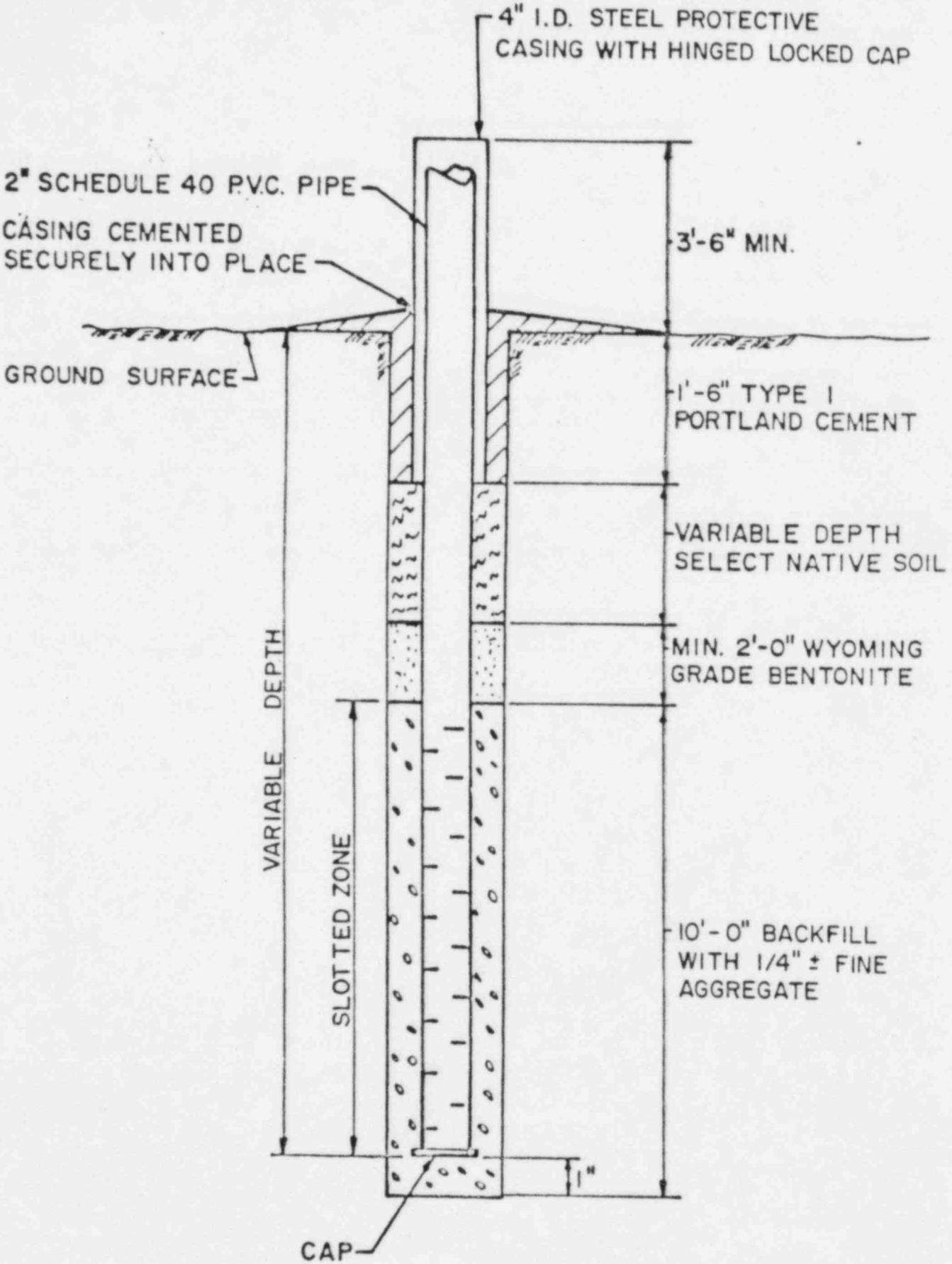
Ground Water Elevation None

Depth of Test Pit 36"

Log (in.)	Material and Remarks	Sample No.	Sample Depth
0" / 9½"	Crushed limestone aggregate		
9½" / 36"	Brown fine silt/ clayey silt - moist - compact - no coarse fragments - encountered	1 Bag	9½" to 36"
	PVC vinyl liner at 36"		
	End of Test Pit at 36"		
	Pit hand dug with dimensions of 24" W x 48" L		
	in center of basin floor		

General Remarks

Inspector David L. VanOrder Resident Engineer



TYPICAL PIEZOMETER INSTALLATION

PLATE NO. 7

TABLE NO. I

PROPOSED
SOLID WASTE DISPOSAL FACILITY
THREE MILE ISLAND
GPU NUCLEAR CORPORATION
MIDDLETOWN, PENNSYLVANIA

DATA ON GROUND-WATER OBSERVATION WELLS

Boring No.	Ground Elevation	Elev. Top of Pipe	Elev. Tip of Wellpoint	Elev. Bottom of Boring
1	293.0	296.5±	262.0	261.5
2	294.5	298.0±	264.5	263.5
3	307.4	311.4±	262.4	262.4
4	293.4	296.9±	262.4	261.9

NOTES:

1. Well pipes are 2" I.D. PVC.
2. Ten (10)-foot-long slotted wellscreens (0.010" slots) form lower part of wells.
3. All wells protected with 4" I.D. steel protecting casing with hinged locking cap.

SUMMARY OF OBSERVATION WELL READINGS

DATE	Ground Water Elevations			
	Boring No. 1	Boring No. 2	Boring No. 3	Boring No. 4
7/10/84	284.4	285.4	--	--
7/11/84	281.9	283.5	--	283.4
7/12/84	281.6	283.2	281.2	281.0
7/31/84	279.7	280.1	279.4	279.4

August, 1984

F. T. Kitlinski & Associates, Inc.
Harrisburg, Pennsylvania

Nuclear

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number:

April 1, 1985
5230-85-2017

Mr. Robert G. Benvin, Facilities Supervisor
Bureau of Solid Waste Management
Pennsylvania Department of Environmental Resources
One Ararat Boulevard
Harrisburg, Pa. 17110

Dear Mr. Benvin:

Subject: On-Site Disposal Facility for Site
Generated Filter Cake Phase II

In response to your approval of the Phase I application for the proposed disposal facility, GPU Nuclear hereby submits to your Bureau, Phase II of the Licensing application. Accompanying this letter of submittal is the following information:

1. Form No. 2 - Site Application Module
2. Module No. 3 - Sanitary Landfill with Liner
3. Module No. 7 - Industrial Hazardous Waste Disposal Sites
4. Module No. 8 - Groundwater Module Monitoring Points
5. Form No. 6 - Certification of Facility Design and Construction

Upon your Bureau's approval, GPU Nuclear will begin to implement permanent use of the proposed facility for landfill of the site-generated filter cake.

Should you have any questions or require further information in regard to this permit request, please contact Mr. Thomas A. Grace, our Environmental Licensing Engineer, at (717) 948-8793.

Sincerely,

H. D. Hukill
Director, TMI-1

HDH/TAG/spb
GPU Nuclear Corporation is a subsidiary of the General Public Utilities Corporation
Enclosures

0056R

SOLID WASTE DISPOSAL SITES
SITE APPLICATION MODULE
PHASE II

PROPOSED
SOLID WASTE DISPOSAL FACILITY
GPU NUCLEAR CORPORATION
THREE MILE ISLAND
MIDDLETOWN, PENNSYLVANIA

- FORM NO. 2

  - SOLID WASTE CHARACTERISTICS
  - LANDFILL DESIGN AND OPERATION

  - FIGURES

    1) PROJECT LOCATION PLAN - USGS MAP
    2) PROJECT COORDINATE PLAN ON TMINS
    3) PROJECT LAYOUT AND DETAILS

- MODULE NO. 3 - SANITARY LANDFILL WITH LINER

  - TABLE

    1) LINER MANUFACTURER'S TECHNICAL SPECIFICATIONS

  - FIGURE

    1) LEACHATE CONTROL SCHEMATIC

- MODULE NO. 7 - INDUSTRIAL AND HAZARDOUS WASTE DISPOSAL SITES

- MODULE NO. 8 - GROUNDWATER MODULE MONITORING POINTS

- FORM NO. 6 - CERTIFICATION OF FACILITY DESIGN AND CONSTRUCTION

MARCH, 1985

ER-SWM-5.6/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SOLID WASTE DISPOSAL SITES
SITE APPLICATION MODULE
FORM NO. 3
PHASE II

I. D. NUMBER
3 0 1 0 2 9

PART I – SOLID WASTE CHARACTERISTICS

SOURCE, TYPE, AND VOLUME OF WASTES (CHECK THE SOURCE AREA, GIVE A BRIEF DESCRIPTION OF THE TYPE OF PRESENT WASTE AND 10-YEAR PROJECTED VOLUME – IF THE PROPOSED LIFE OF THE LANDFILL IS LESS THAN 10 YEARS, WHAT IS THE PROJECTED VOLUME OF WASTE IN THE FINAL YEAR OF LANDFILL OPERATION? SUBMIT CHEMICAL ANALYSES OF HAZARDOUS WASTES WHICH ARE PROPOSED TO BE ACCEPTED OR ARE BEING ACCEPTED BY THE LANDFILL.)

A. SOURCE	TYPE (Description)	PRESENT VOL – (Tons, Cubic Yds. Gallons/yr.)	PROJECTED VOL (10 YRS) – (Tons, Cubic Yds. Gallons/yr.)
1. RESIDENTIAL			
2. COMMERCIAL			
3. INDUSTRIAL	Diatomaceous earth & silt based filter cake	365 tpy	365 ton/yr. for 10 yrs.
4. AGRICULTURAL			
5. OTHER (EXPLAIN)			

ADDITIONAL COMMENTS ON SOURCE, TYPE, AND VOLUME OF WASTE

B. DAILY WASTE QUANTITIES (INDICATE AMOUNT OF WASTE THE LANDFILL WILL ACCEPT EACH DAY–VOLUME OR WEIGHT STATED IN SAME UNITS AS A ABOVE).

1. MAXIMUM DAILY VOLUME OR WEIGHT: 2 tons per day
2. MINIMUM DAILY VOLUME OR WEIGHT: 0
3. AVERAGE DAILY VOLUME OR WEIGHT: 1 ton per day

PART II – LANDFILL DESIGN AND OPERATION

A. DETAILED PLANS AND MAPS OF LANDFILL

SUBMIT ALL PLANS AND DOCUMENTS IN TRIPLICATE. THE FRONT COVER OR FLYLEAF OF EACH SET OF DRAWINGS AND SPECIFICATIONS MUST BEAR THE SIGNATURE AND SEAL OF THE REGISTERED PROFESSIONAL ENGINEER. EACH DRAWING MUST BEAR AN IMPRINT OR REASONABLE FACSIMILE OF SUCH SEAL.

1. PROPERTY LINE MAP

A. INDICATE PROPERTY LINES OF SITE, USE OF ADJACENT PROPERTIES, AND SHOW ALL RIGHT-OF-WAYS (FUEL AND POWER LINES, ROADS, ETC).

ER-SWM-5 8/78

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SOLID WASTE DISPOSAL SITES
SITE APPLICATION MODULE
FORM NO. 2
PHASE II

I. D. NUMBER
3 0 1 0 2 9

A. DETAILED PLANS AND MAPS OF LANDFILL – CONTINUED

(1) IF RIGHT-OF-WAYS EXIST, NAME of OWNER/COMPANY AND USE N/A

(2) DOES OWNER OR OPERATOR OWN MINERAL RIGHTS? [X] Yes [ ] No

(3) IF NOT, NAME AND ADDRESS OF OWNER OF MINERAL RIGHTS N/A

2. DETAILED TOPOGRAPHIC MAP(S) OF SITE SHOULD INCLUDE THE FOLLOWING: (MORE THAN ONE MAP MAY BE USED TO SHOW THE REQUIRED INFORMATION LISTED BELOW)

A. SCALE (1:200' OR LARGER, MEANING RATIO LARGER THAN .008).	X
B. 10' CONTOUR INTERVAL.	X
C. LOCATION OF ACCESS ROADS.	X
D. LOCATION OF FENCING.	X
E. WEIGHING FACILITIES, IF ANY.	N/A
F. LOCATION OF EXISTING AND PROPOSED UTILITIES.	X
G. LOCATION OF DISCHARGE POINT OF GROUND WATER, IF ANY.	N/A
H. LOCATION OF AND IDENTITY OF MONITORING WELLS, SPRINGS, AND WELLS DRILLED.	X
I. DIRECTION OF GROUND WATER FLOW (IF MORE THAN ONE DIRECTION OF GROUND WATER FLOW, INDICATE OTHER DIRECTIONS ALSO). (Reference Phase I, Exhibit C, Plate 3)	X
J. LOCATION OF: (PLACE THE FOLLOWING INFORMATION ON THE DETAILED TOPOGRAPHIC MAP IF IT IS WITHIN THE SITE OR WITHIN A QUARTER-MILE OF THE OUTER PERIMETER OF THE SITE UNLESS OTHERWISE NOTED. CHECK EACH ITEM BELOW AS IT IS PLACED ON THE MAP).	X

[X] WELLS	N/A [ ] SOIL STOCKPILE	[X] POWER LINE RIGHT OF-WAYS
N/A [ ] SPRINGS	[X] FIRE HYDRANTS	N/A [ ] FUEL LINE RIGHT-OF-WAYS
N/A [ ] SWAMPS	N/A [ ] OTHER BODIES OF WATER	N/A [ ] LIFTS
[X] STREAMS	N/A [ ] UNDERGROUND & SURFACE MINES	[X] WATER TOWERS
[X] PUBLIC OR PRIVATE WATER SUPPLIES WITHIN ¼-MILE	[ ] MINING SPOIL PILES N/A	[X] DIVERSION DITCHES
N/A [ ] FIRE PONDS	N/A [ ] GAS & OIL WELLS	N/A [ ] AIRPORT AND/OR AIRPORT APPURTENANCES WITHIN 10,000 FT.

ER-SWM-5:6/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SOLID WASTE DISPOSAL SITES
SITE APPLICATION MODULE
FORM NO. 2
PHASE II

I. D. NUMBER
3 0 1 0 2 9

A. DETAILED PLANS AND MAPS OF LANDFILL - CONTINUED

3. DESIGN (CHECK EACH ITEM AS IT IS INCLUDED ON THE DETAILED PLANS). See pg. 5

X (i) COMPACTION OF SOLID WASTE, THICKNESS OF LIFT
X (ii) APPLICATION OF DAILY COVER MATERIAL, INTERMEDIATE, FINAL COVER
X (iii) ELEVATION AND GRADE OF FINAL COVER
X (iv) MANAGEMENT OF SURFACE WATER IN ACCORDANCE WITH CHAPTER 120
X (v) EROSION CONTROL IN ACCORDANCE WITH CHAPTER 102
X (vi) REVEGETATION PROCEDURES TO BE USED
X (vii) SCHEDULE OF FILLING
X (viii) SITE PREPARATIONS
X (ix) MONITORING DEVICES
X (x) LOCATION AND LIMITS OF AREAS PREVIOUSLY FILLED, IF APPLICABLE
X (xi) CROSS-SECTIONS INDICATING THE INTERFACE DETAILS BETWEEN AREAS PREVIOUSLY FILLED AND AREAS TO BE FILLED, WHERE APPLICABLE
X (xii) LIMITS OF CONSTRUCTION DEFINED BY GRID CONTROLS
X (xiii) BORROW AREAS ON-SITE DEFINED BY GRID CONTROLS/OR OFF-SITE
X (xiv) LOCATION, DESCRIPTION, AND PURPOSE OF ALL EASEMENTS EXISTING ON-SITE AND A DEFINITION OF ALL TITLE, DEED, OR USAGE RESTRICTIONS RELATIVE TO THE SITE
X (xv) LOCATION OF GAS AND OIL WELLS ON-SITE
X (xvi) LOCATION OF PUBLIC AND PRIVATE WATER SUPPLIES ON-SITE OR WITHIN ¼-MILE OF SITE
X (xvii) LOCATION OF UNDERGROUND AND SURFACE MINES ON-SITE
X (xviii) CROSS-SECTIONS SHOWN ON THE PLANS SHALL BE REFERENCED TO THE GRID SYSTEM FOR HORIZONTAL LOCATION, WHENEVER APPLICABLE
X (xix) GRADES REQUIRED FOR PROPER DRAINAGE OF LIFTS.
X (xx) THE DESIGN PLANS SHALL INCLUDE A CROSS-SECTION OF THE ACCESS ROADS AND ALL-WEATHER ROADS IDENTIFYING CONSTRUCTION MATERIALS, SLOPES, GRADES AND DISTANCES
X (xxi) CROSS-SECTIONS, GRADES AND/OR PROFILES OF DIVERSION DITCHES, CAPACITIES AND CALCULATIONS FOR DITCH VOLUME
X (xxii) GRADES INDICATING THE DEPTH OF SOIL AVAILABLE AT THE SITE FOR COVER MATERIAL
X (xxiii) A CONSTRUCTION SCHEDULE SHALL BE SUBMITTED BY THE APPLICANT TO THE DEPARTMENT IN A FORMAT ESTABLISHED BY THE DEPARTMENT
X (xxiv) GAS MANAGEMENT

4. LEACHATE COLLECTION AND TREATMENT PROPOSAL, INCLUDING DESIGN PLAN.

A. LOCATION OF COLLECTION AND TREATMENT FACILITIES. See pg. 9

B. CROSS-SECTIONS OF TREATMENT LAGOONS AND PROPOSED COLLECTION FACILITIES. N/A

C. LOCATION OF DISCHARGE POINTS OF TREATED LEACHATE (REQUIRES INDISUTRIAL WASTE PERMIT). See pg. 10

D. METHOD OF DISPOSAL IF NOT DISCHARGED (PUBLIC SEWER, SPRAY BACK, ETC.) N/A

5. LOCATION OF PROPOSED GROUND WATER MONITORING POINTS MUST BE SHOWN ON DETAILED TOPOGRAPHIC MAP.

A. HAVE PROPOSED GROUND WATER MONITORING POINTS BEEN SUBMITTED? ☒ YES ☐ NO

6. STREAM OBSTRUCTION OR RELOCATION REQUIRES APPLICATION TO BUREAU OF WATER QUALITY MANAGEMENT FOR PERMIT. N/A

ER-SW34-S 6/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SOLID WASTE DISPOSAL SITES
SITE APPLICATION MODULE
FORM NO. 2
PHASE II

I. D. NUMBER
3 0 1 0 2 9

B. OPERATION NARRATIVE – (DESCRIBE: CHECK AS COMPLETED) See pg. 11

1. DAILY OPERATIONAL RECORDS SYSTEM	X	11. SALVAGE	X
2. PROPOSED LANDFILL METHOD	X	12. ACCESS AND TRAFFIC CONTROL	X
3. SCHEDULE OF FILLING	X	13. COVER MATERIAL, QUANTITIES & USE	X
4. SITE PREPARATION	X	14. FINAL SLOPES AND CLOSURE PROCEDURES	X
5. DESIGNATION OF UNLOADING AREA	X	15. PROPOSED REVEGETATION PROCEDURE	X
6. COMMUNICATIONS	X	16. COMPLETED SITE MAINTENANCE PROVISIONS	X
7. FIRE PROTECTION	X	17. DUST CONTROL METHODS	X
8. COMPACTION & COVERING PRACTICE	X	18. VECTOR CONTROL METHODS	X
9. PROVISIONS FOR BLOWING LITTER CONTROL	X	19. ACCIDENT PREVENTION AND SAFETY	X
10. MANAGEMENT OF SURFACE WATER AND EROSION CONTROL	X	20. EQUIPMENT, LIST	X
		21. AVAILABILITY OF PUBLIC UTILITIES	X

C. *ENGINEER RESPONSIBLE*

1. NAME D.K.Croneberger
2. ADDRESS GPU Nclear Corp.
100 Interpace Parkway
Parsippany, New Jersey 07054
TELEPHONE NO. (201) 263-2031
3. REGISTRATION NUMBER 10225E
4. SIGNATURE
5. SEAL OF REGISTERED PROFESSIONAL ENGINEER

SEAL

Part II - Landfill Design and Operation

Section A. Detailed Plans and Maps of Landfill

3. Design

A.3.(i) Compaction of Solid Waste, Thickness of Lift

Each basin will be regarded as a cell incorporating the use of one approximately seven-foot thick lift. The filter cake is to be deposited into the basin on a weekly to bi-monthly schedule, depending on quantity of production. An average deposition will consist of 5 to 10 cubic yards (1 $yd^3 \approx$ 1 ton). The material will be deposited by dump truck and then spread and lightly compacted by a front end loader. Filling of each basin will begin at a point adjacent to the berm separating Basins A and B and opposite of the point where the access roads enter each basin. The north basin (Basin A) will be filled in a south to north fashion while the south basin (Basin B) will be filled in a north to south fashion. Prior to deposition on the gravel surface of the basin, plastic sheeting will be placed, to minimize infiltration of the filter cake into the gravel. This will allow maximum usage of the 0.50% slope in each basin to collect and transport rainwater to the leachate collection sump for treatment in the Industrial Wastewater Treatment Facility.

A.3.(ii) Application of Daily Cover Material, Intermediate, Final Cover

Due to the nature and composition of the fill material, daily and intermediate cover materials are not considered necessary. Once each basin is filled to capacity, it will be graded to slope rain away from the basin, covered with plastic sheeting, followed by a 2-foot thick cap of cover soil. The plastic sheeting will minimize infiltration of rainfall into the cell therefore avoiding a "bathtub" effect. A suitable soil similar to that found in several borrow sites located on the southern portion of Three Mile Island will be used for final cover material. The cover material is a fine-grained soil that is classified as CL-ML type, which indicates clayey-silt/silt soils. The soil proposed for the final cover is, in essence, identical to that used to provide the 24-inch thick layer covering each basin's 30-mil PVC liner.

A.3.(iii) Elevation and Grade of Final Cover

The final cover for each basin will slope in an east to west fashion as shown in Figure 3. This will allow rain runoff to be collected in the TMINS yard drainage system and prevent infiltration into the disposal cell. Final cover elevation for each basin will be 312.0 ft. with an east to west grade of 0.50%.

A.3.(iv) Management of Surface Water in Accordance with Chapter 102

As shown in Figure 3, surface water outside Basins A and B is directed to the TMINS yard drainage ditch via intercept ditch or natural slope runoff from outer basin sides. All surface runoff crosses either vegetation or stone stabilized surfaces thus minimizing accelerated erosion and sedimentation. Due to previous installation of the basins, there will be no new earth moving, with the exception of capping each basin with a final soil cover. The final cover will be stabilized with shallow rooted vegetation and have a gentle slope leading water towards the site's yard drainage system. Surface water collected within each basin will be treated as leachate via the TMINS Industrial Wastewater Treatment Facility.

A.3.(v) Erosion Control in Accordance with Chapter 102

Outer basin slopes have established vegetation to minimize erosion and interceptor ditches lead to the TMINS Yard Drainage System. The inner slopes of both basins are rip-rapped with a 9-inch thick layer of Pennsylvania Department of Transportation Number 3A coarse aggregate. The final cover surface will be stabilized and revegetated in the manner described in A.3.(vi).

The erosion control of both Basin A and B will be included within the Soil Erosion and Sedimentation Control Plan for TMINS.

A.3.(vi) Revegetation Procedures To Be Used

All outside slopes of the basins had been seeded, fertilized and mulched in conformance with Sections 804 and 805 of Form 408, Pennsylvania Department of Highways Specification. All slopes are now stabilized with standing vegetation cover. The final cover to the landfill will be treated in a similar manner, using a 50:50 mixture of Crown Vetch and Perennial Rye Grass as recommended in the Pennsylvania State Agronomy Guide. The seed shall be applied at the rate of 40 lbs. per acre. Pulverized limestone shall be applied at the rate of 3,500 lbs. per acre. The fertilizer shall be a commercial grade of 8-16-16 composition applied at the rate of 900 lbs. per acre. The mulch cover shall consist of hay, applied at the rate of 2 tons per acre.

A.3.(vii) Schedule of Filling

The schedule for filling of Basins A and B will be based on an "as-acquired" basis. Basin A will be filled first. Upon reaching capacity, it will be capped in the manner described in A.3.(iii), and then Basin B will be filled. The filter cake will be delivered to the disposal site from the filter cake storage building in 5 to 10 ton batch loads. As the filter cake is generated by the Industrial Wastewater Filtration System, it is delivered to the Filter Cake Storage Building. Filter cake is segregated and given a Radioisotopic Assay Analysis. Once the filter cake is cleared for disposal, it is placed in a stockpile adjacent to the building. When a sufficient quantity for disposal is collected in the stockpile, it will be loaded into a dump truck by a front end loader and transported to the disposal basin.

A.3.(viii) Site Preparations

All site preparations for the proposed facility have been completed. The existing basins have been in place since 1972. Monitoring wells and a geotechnical engineering investigation for the site were completed in August, 1984.

A.3.(ix) Monitoring Devices

Should they be required for monitoring, there are four monitoring wells, in place, surrounding Basin A and B, as shown in Figure 3. The technical specifications for all four wells was discussed in Phase I, Appendix B.

A.3.(x) Location and Limits of Areas Previously Filled, If Applicable

Not applicable.

A.3.(xi) Cross Sections Indicating the Interface Details Between Areas Previously Filled and Areas To Be Filled, If Applicable

Not applicable.

A.3.(xii) Limits of Construction Defined By Grid Controls

Figure 2 represents the limits of construction as defined by grid control based on the Pennsylvania Coordinate System, South Zone.

A.3.(xiii) Borrow Areas On-site Defined By Grid Controls/Or Off-site

The borrow area which will supply the soil required in covering the site is shown in Figure 1. The soil is a light brown, silty-clay, that is rated CL-ML in plasticity. As discussed in A.3.(ii), the soil is similar to that used in creating the clay layer covering the basin 30-mil PVC liner.

A.3.(xiv) Location, Description and Purpose of All Easements Existing On-site and a Definition of All Title, Deed and Usage Restrictions Relative to the Site

Three Mile Island Nuclear Station is controlled and operated by General Public Utilities Nuclear Corporation, a subsidiary of General Public Utilities Corporation. The site is deeded 50% Metropolitan Edison Company, 25% Pennsylvania Electric Company and 25% Jersey Central Power and Light Company. All three holding companies are subsidiaries to General Public Utilities Corporation. By deed of conveyance, Metropolitan Edison Company has easement rights at Three Mile Island Nuclear Station for the running, operation and maintenance of electrical lines. The reason for this is due to the station existing in Metropolitan Edison Company's operating area.

A.3.(xv) Location of Gas and Oil Wells On-Site

Not applicable, there are none on site.

A.3.(xvi) Location of Public and Private Water Supplies On-Site or Within 1/2 Mile of Site

There are no public or private water supplies on the site. Within 1/2 mile of the site there are approximately 27 private drinking water wells and 1 public water well, as shown on Figure 1. Since these wells are across the east channel of the Susquehanna River from the proposed disposal site, they will not be impacted upon by the disposal site in any fashion.

A.3.(xvii) Location of Underground and Surface Mines On-Site

Not applicable, there are none on site.

A.3.(xviii) Cross Sections Shown on the Plans Shall be Referenced to the Grid System for Horizontal Location

Not applicable.

A.3.(xix) Grades Required for Proper Drainage of Lifts

Each basin will be filled as one lift. A slope of 0.50% is already designed into each basin for the provision of drainage to the leachate collection and pumping station.

A.3.(xx) The Design Plans Shall Include a Cross Section of the Access Roads and All-Weather Roads, Identifying Construction Materials, Slopes, Grades and Distances

All information is shown in Figures 2 and 3.

A.3.(xxi) Cross Sections, Grades and/or Profiles of Diversion Ditches, Capacities and Calculations for Ditch Volume

Cross sections, grades and profiles of existing diversion ditches are shown in Figure 3. The TMINS Yard Drainage System is designed to have a 6 hour Probable Maximum Precipitation of 27.1" rainfall in 6 hours (TMI-2 FSAR Section 2.4.2.3) capacity. Due to the location of basins and the wall elevations of the dike surrounding north, west and south sides of the basins, flooding of the basins due to surface runoff is not probable. The 8-inch deep diversion ditch, running north to south on the east side of the basins prevents runoff of rainfall on the station river dike from entering the basins. Both basins have north, west and south wall elevations ranging from 7 to 14 feet higher than the existing grade adjacent to the wall. Existing grade surrounding the basin is elevation 293 feet ±. The TMINS yard drainage ditch running north to south on the west side of the basins has an existing grade of elevation 290 feet ± to

the north, descending to elevation 286 feet ± at the south end of the basins. The surface elevation of the basin dike is elevation 300 feet. The surface elevation of the TMINS dike adjacent to the east side of the basins is 307 feet ± on the north end, descending to 305 feet ± on the south end.

A.3.(xxii) Grades Indicating The Depth of Soil Available at the Site for Cover Material

Soils to be removed from the borrow pits, shown in Figure 1, are restricted to an excavation limit of elevation 282.0 feet.

A.3.(xxiii) A Construction Schedule Shall Be Submitted By The Applicant to the Department in a Format Established by the Department

Not applicable. All components to the proposed site and leachate collection/treatment are completed and in use systems.

A.3.(xxiv) Gas Management

Not applicable. Due to the nature of the material contained in the site generated filter cake, there will be minimal generation of methane gas. Gas management is not considered a necessary part to the system design.

4. Leachate Collection and Treatment Proposal

A.4.A. Location of Collection and Treatment Facilities

The location of leachate collection and treatment facilities for the proposed landfill are shown in Figure 2. The leachate to be collected would come from rainfall entering the basins. It will be collected in a manner similar to that already in use with dewatering the rainfall from the basins. The water will be pumped, using established equipment, via the pump house, located between Basin A and B, through the TMI-1 Turbine Sump and into the Industrial Wastewater Treatment Sump (IWTS). Once transported to the IWTS, the water is treated to meet those discharge requirements stipulated in the TMINS NPDES Permit for the IWTS, Discharge Serial Number (DSN) 107.

By use of the IWTS Air Flotation Separator, excessive solids from the IWTS sump, as introduced by station operation and/or leachate removal from the basins, are transferred to the Industrial Wastewater Filtration System (IWFS). At the IWFS, the solids are removed from the wastewater sludge via diatomaceous earth pressure filtration. Filtered water is discharged from the station via NPDES Permit DSN 104. The accumulated solids are dewatered using a hydraulic filter press. The results of the dewatering is the creation of filter cake. A simple flow path schematic of this operation is shown in Phase II, Module 3, Figure 1.

A.4.B. Cross Sections of Treatment Lagoons and Proposed Collection Facilities

Not applicable. There are no treatment lagoons in this system.

A.4.C. Location of Discharge Points of Treated Leachate

The treated leachate will be discharged, combined with all additional station discharges, out NPDES DSN 001, shown in Figure 2.

A.4.D. Method of Disposal, If Not Discharged

Not applicable. All collected leachate will be treated as described in A.4.A.

Section B. Operations Narrative

B.1. Daily Operational Records System

As filter cake is generated, it is taken to the Filter Cake Storage Building and segregated from other filter cake. Once placed in the building, a representative composite sample is taken, for routine radioisotopic analysis, per station procedure. Data is screened by TMINS personnel. Upon clearance, filter cake is then stockpiled and disposed of when a suitable quantity (5 to 10 tons) is reached. The filter cake generated and its respective radioisotopic analysis will thus be recorded and maintained.

B.2. Proposed Landfill Method

The proposed landfill method to be used would be a modified trench method. To start, the filter cake is placed into the respective basin, working from the end opposite the access ramp, spread into thin layers (18-24 inches thick) and compacted. This operation will continue until the desired elevation for final soil coverage is reached. Final cover material will be obtained from an outside source, as referenced in Section A.3.(xiii).

B.3. Schedule of Filling

Reference Section A.3.(vii).

B.4. Site Preparation

Reference Section A.3.(viii).

B.5. Designation of Unloading Area

Not applicable. There is to be no designated unloading area.

B.6. Communications

In case of emergencies, telephones are closely accessible within the station. There will be no telephone connection at the basins.

B.7. Fire Protection

Not applicable due to the nature of the material being disposed of. However, hydrants in the vicinity of the disposal basins are shown in Figure 3.

B.8. Compaction and Covering Practices

Reference Sections A.3.(i)-(iii).

B.9. Provisions for Blowing Litter Control

Not applicable. There will be no litter-type materials placed in the proposed landfill.

B.10. Management of Surface Water and Erosion Control

Reference Sections A.3.(iv) and (v).

B.11. Salvage

Not applicable. There will be no salvageable materials placed in the proposed landfill.

B.12. Access and Traffic Control

All access and traffic onto and off TMINS is monitored. Access and usage of the proposed landfill will be restricted only to those vehicles required to be there for the disposal and landfilling of the filter cake.

B.13. Cover Material, Quantities and Use

Reference Section A.3.(ii).

B.14. Final Slopes and Closure Procedures

Reference Section A.3.(iii).

B.15. Proposed Revegetation Procedure

Reference Section A.3.(vi).

B.16. Completed Site Maintenance Provisions

Upon completion of filling each basin and application of the final cover, the basins will be graded to final slope and revegetated. The leachate extraction wells will be monitored and leachate drawn from the basins on an as needed basis. Due to the site location within the Owner controlled Region of TMINS, access to the sites will be restricted. Once completed, periodic filling and regrading may be required to maintain, for the next 2 to 5 year period, proper surface drainage conditions.

B.17. Dust Control Methods

Not applicable due to the nature of the material and minimal vehicular traffic in the proposed landfill.

B.18. Vector Control Methods

Not applicable. The filter cake material is not conducive towards harboring vector species.

B.19. Accident Prevention and Safety

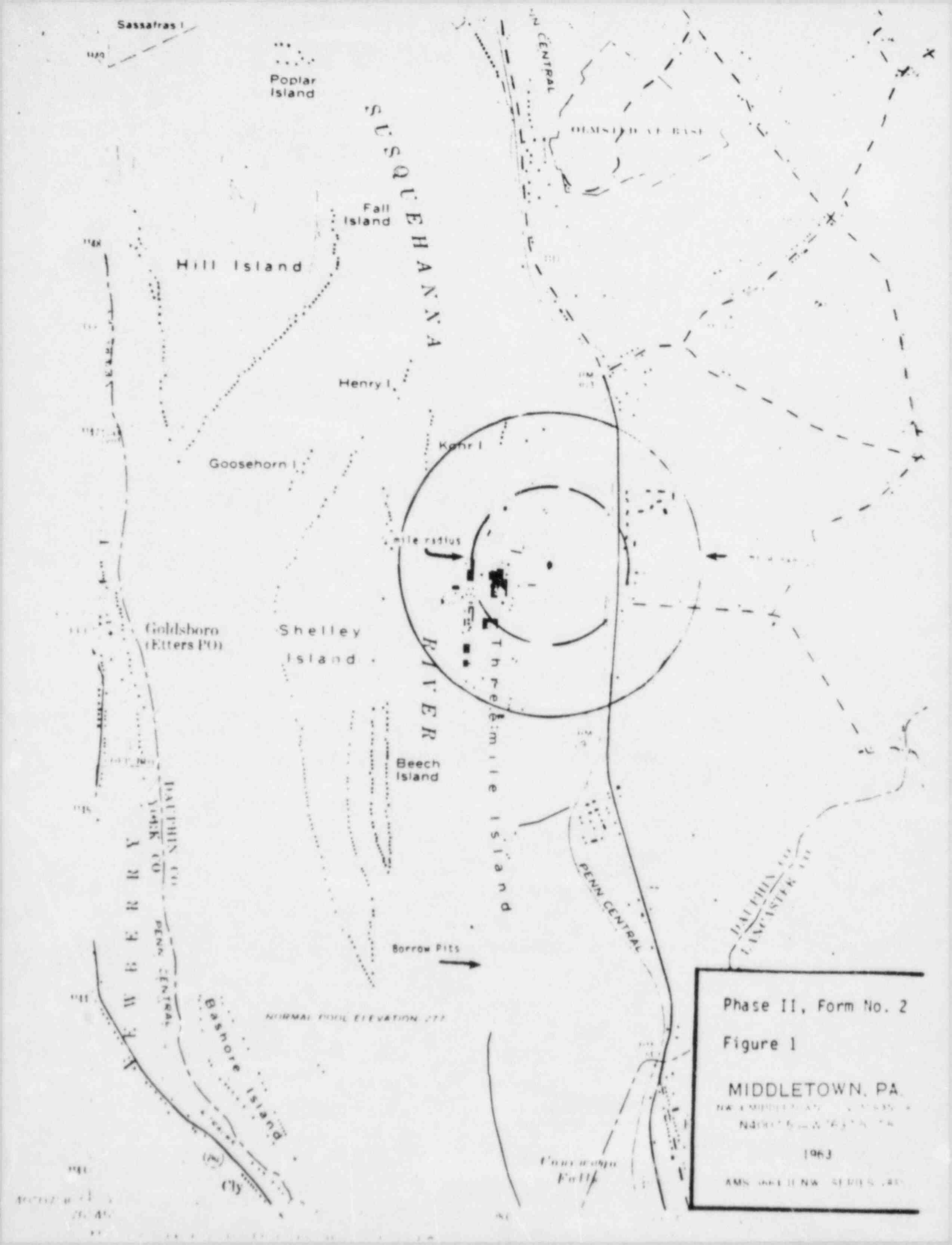
Accident prevention and safety procedures applicable to TMINS operations will be extended for usage with the landfill.

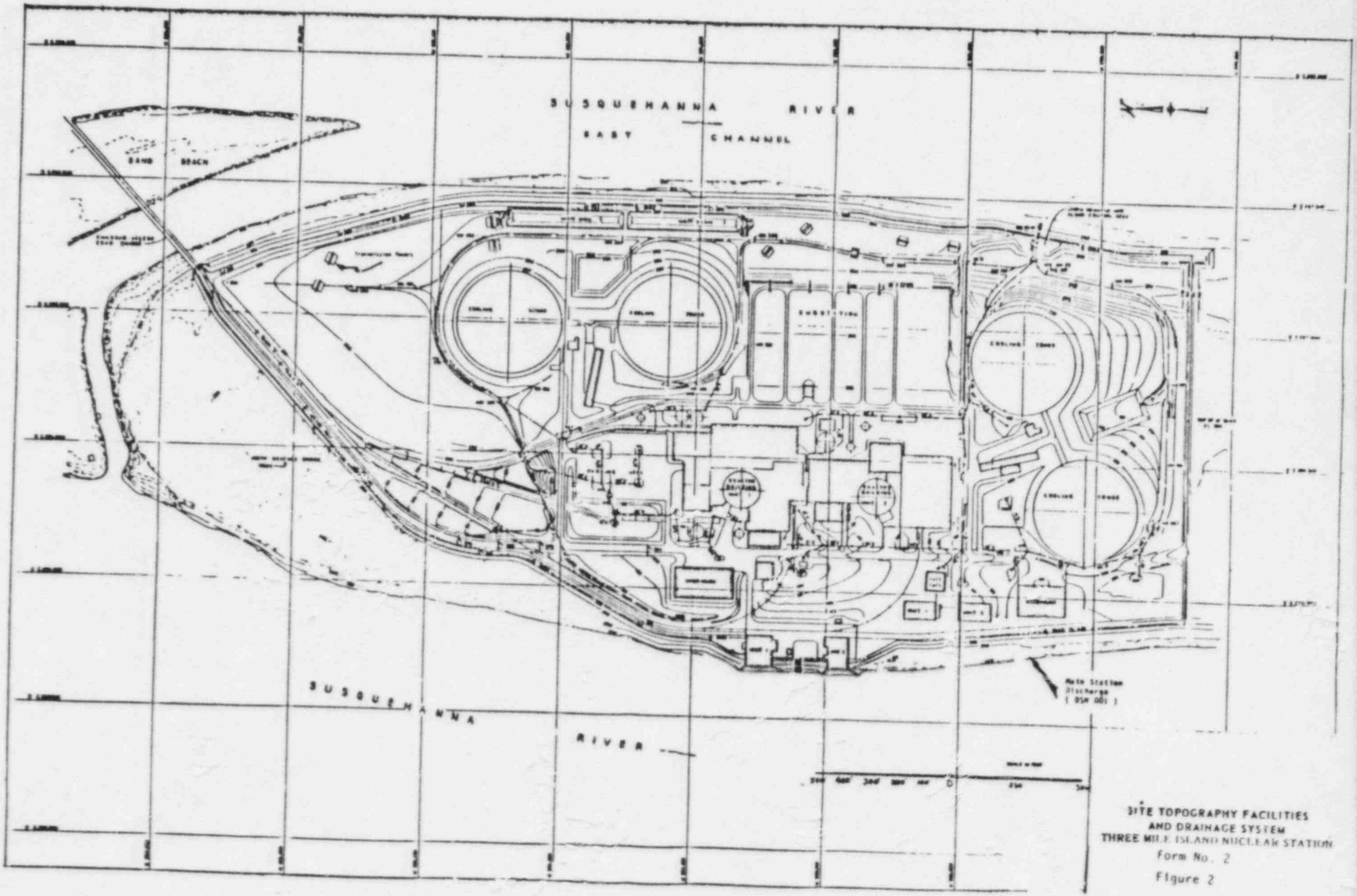
B.20. Equipment List

TMINS has available suitable tools and equipment which would be necessary to operate a licensed landfill. Large equipment available for usage includes the following: 5 ton dump truck, rubber wheeled front-end loader and backhoe.

B.21. Availability of Public Utilities

Availability of electrical power and water, should either be required, is readily obtainable.


Sassafras I
Poplar Island
SUSQUEHANNA
Fall Island
Hill Island
Henry I
Kohr I
Goosehorn I
mile radius
Goldsboro (Etters PO)
Shelley Island
RIVER
Three Mile Island
Beech Island
Borrow Pits
PENN CENTRAL
Bashore Island
Cly
Phase II, Form No. 2
Figure 1
MIDDLETOWN, PA.
1963



SITE TOPOGRAPHY FACILITIES
AND DRAINAGE SYSTEM
THREE MILE ISLAND NUCLEAR STATION
Form No. 2
Figure 2

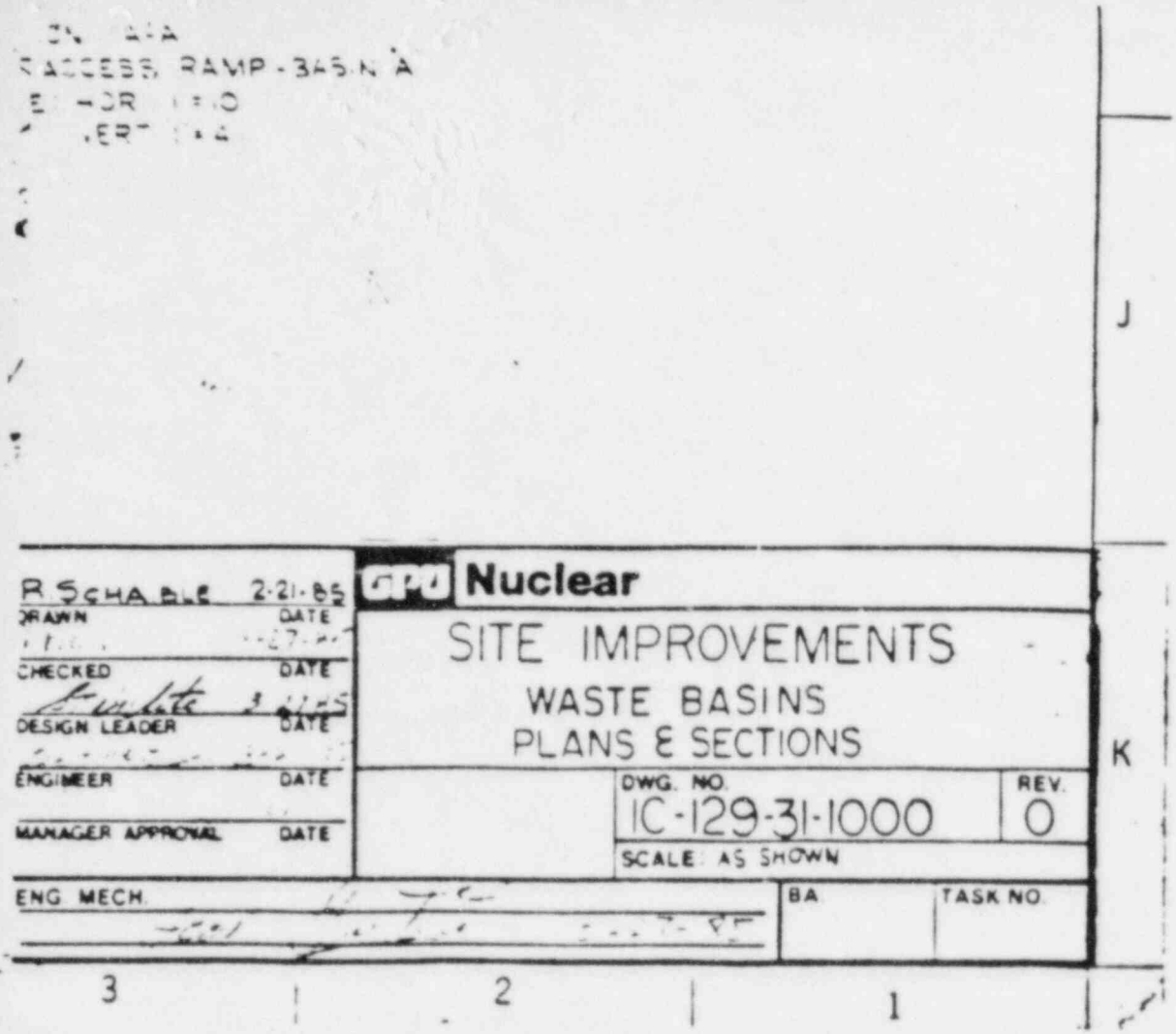


FIGURE 3

PROJECT LAYOUT AND DETAILS

ER-SWM-18:5/79

COMMOMWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

SANITARY LANDFILL WITH LINER
MODULE NO. 3
PHASE II

DATE PREPARED: 03-27-85

I. D. NUMBER: 3 0 1 0 2 9

1. LOCATION	A. Total Available Acreage of Site		1.5 acres	
	B. Total Acreage Utilitzed		1.5 acres	
	C. Distance (feet) To	(1) Nearest occupied dwelling(s)	1,300 ft.	
		(2) Nearest stream or spring	150 ft.	
		(3) Nearest well(s)	1,300 ft.	

2. MANUFACTURED LINERS	Liner composition generic and trade name	30-mil - Polyvinyl Chloride (PVC) Plastic***
	Size of increments to be constructed	*
	Permeability value of in place liner proposed - cm/sec	Manufacturer's testing of liner accords a permeability of less than 10^{-12} cm/sec
	Type of subgrade preparation required for liner installation	** p. 6
	Source of specification for liner quality control (Pennsylvania Department of Transportation, EPA, Manufacturer, etc)	Manufacturer (Staff Industries, Inc.), U.S. Bureau of Reclaimation, U.S. Army Corps. of Engineers
	Required protective cover, describe available quantity	** p. 6
	Type of monitoring system to be utilized for the liner and/or the total facility	** p. 9
	Bearing capacity of site - pounds/square foot	2200 psi minimum. Average test results show 2733 psi longitudinal & 2437 psi transverse
	Maximum applied load on liner - pounds/square foot	Not Applicable
	Minimum distance from liner subgrade to ground water	** p. 17c

*Basin A, 2 pcs, 48.7'x446' and 48.7'x456' (North Basin)
Basin B, 2 pcs, 48.7'x446' and 48.7'x460' (South Basin)

The PVC liner for each basin was supplied in two sections, with the seam in the longitudinal direction, field spliced upon installation.

**Phase I Application, Exhibit E, Report on Geotechnical Engineering Investigation for Proposed Solid Waste Disposal Facility, by F. T. Kitlinski & Associates.

***Manufacturer's Technical Specifications are shown in Table 1, p. 4.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SANITARY LANDFILL WITH LINER
MODULE NO. 3
PHASE II

I. D. NUMBER
3 0 1 0 2 9

SOIL LINERS

NATURAL LINERS, NATURALLY OCCURRING IMPERMEABLE ZONES.

3. A. Is the proposed collection medium available in an undisturbed state? ☐ Yes ☐ No
If yes, describe; give minimum thickness.
N/A

B. If a naturally occurring zone, what is the permeability and thickness of that zone, minimum and maximum? How determined, submit date substantiating conclusions.
N/A

C. Is there an upward groundwater gradient available to the influence area to be collected from?
Yes ☐ No ☐ Describe and substantiate.
N/A

D. Liners to be utilized by manipulation of soils, soil additives, or revisions of in situ soil characteristics. Attach additional information as necessary.) N/A

1. Describe the system proposed to meet permeability requirement for manmade liners. (§75.25a)

2. What is the permeability of the undisturbed in situ soils to be utilized? (Describe and substantiate)

3. What is the thickness of the in situ zone to be utilized? (Describe and substantiate)

4. Describe the quality control program to be implemented to insure uniformity in the design and placement process.

5. What is the compatibility of the manipulated zone with the standard leachate described in the regulations or the particular material to be contained? (Describe and substantiate)

6. Describe the protective covering to be installed over the propsed flow zone.

7. Indicate the quantity, constituency, and characteristics of all soil additives to be utilized and provide test data to justify integrity of the system.

8. How will monitoring requirements be accomplished above, below, or beyond the lined area?

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

SANITARY LANDFILL WITH LINER
MODULE NO. 3
PHASE II

I. D. NUMBER
3 0 1 0 2 9

4. A. How will sides and bottom be constructed so as to be impervious and maintain a 2' minimum freeboard? Briefly describe. N/A

B. With what will sides and bottom be lined? 30-mil vinyl liner, 24-inch clay, 9-inch rock

C. Will surrounding areas be graded to prevent surface water from entering lagoon? Describe ☐ Yes ☐ No N/A

D. Are the impoundments in an area that has been deep mined? ☐ Yes ☐ No N/A

E. Is there active sink hole development in the area? ☐ Yes ☒ No

5. Maximum Anticipated Annual Volumes - gallons
1st year _____ 2nd year _____ 3rd year _____
4th year _____ 5th year _____ N/A

Method of Leachate Management and Disposition (Attach Narrative) Attached, p. 5

If collection and treatment facilities with discharge are to be provided, an application must be made for an Industrial Waste Permit from the Bureau of Water Quality Management for the treatment facility with discharge.

If your landfill facility is to be located in a mine, you must provide the Department of Environmental Resources with written approval from the County Commissioners of the County in which your facility is located. The Department of Environmental Resources cannot issue a permit unless this approval is provided.

6. *ENGINEER*

1. Name D.K. Croneberger
2. Address 100 Interpace Parkway
Parsippany, New Jersey 07054
3. Registration Number 10225E
4. Signature [signature]
5. Seal of Registered Professional Engineer

SEAL

GOODYEAR AEROSPACE

CORPORATION

AKRON, OHIO 44315

TEST REPORT

STYLE: J13D-9635-13 .030x53-1/2"
CUSTOMER: Staff Industries

DATE PRODUCED: 7-8-72
ORDER NUMBER: CLE 62218
CUSTOMER PO#: 13785

TEST	TEST REQUIREMENT	AVERAGE TEST RESULT	
A. Specific Gravity	1.24 to 1.28	1.278	
B. Thickness	Gauge ± 10%	0.0295	
C. Tensile Strength	2200 psi min Long & Trans	Long 2733 psi	Tran 2437 psi
D. Ultimate Elongation	300% min	505 %	501 %
E. 100% Modulus	1000-1600 Range	1077 psi	1002 psi
F. Graves Tear	270 lbs/inch min	289 ppi	320 ppi
G. Water Extraction	0.35% loss max	0.10% loss	
H. Volatility	0.7% max	0.47%	
I. Cold Crack @ -20°F	8 of 10 pass	7 pass	3 fail
J. Dimensional Stability	4.0% max	-2.4%	+1.0%
K. Pinholes	None/10 yards^2 max	None	

Formulation has been tested and passes
Bureau of Reclamation soil burial test

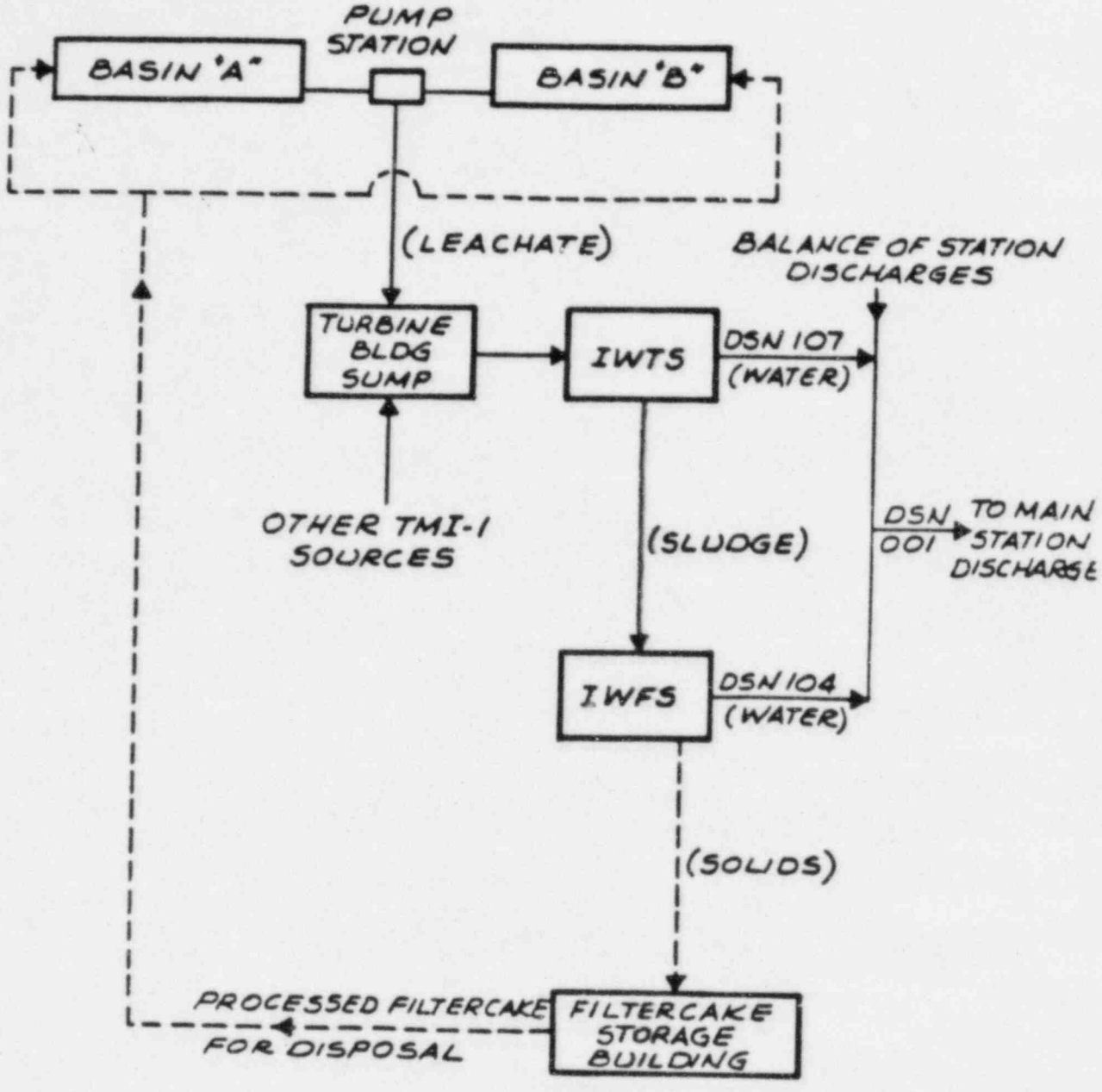
Module No. 3 - Sanitary Landfill with Liner

Section 5. Method of Leachate Management and Disposition

By using the existing Pre-operational Chemical Cleaning Basins for disposal of TMINS generated filter cake, rainfall, the only source of water capable of entering the basins, can be readily collected and treated as leachate. In the past, the basins were used to chemically treat water used to clean TMI-1 and 2 equipment prior to either unit operation, hence the original name, Pre-operational Chemical Cleaning Basins. As such, Basin A and B were designed to be water tight and capable of accumulating and treating water prior to discharge into the Susquehanna. The basins became incorporated into the TMINS NPDES Permit. The original discharge was assigned Discharge Serial Number (DSN) 103 and upon meeting permit guidelines, discharges via DSN 103 went directly into the main station discharge. After the intended use of the Pre-operational Chemical Cleaning Basins was completed, an industrial wastewater treatment system was designed and incorporated into station usage.

The wastewater treatment system was designed as two sections. One section, the Industrial Wastewater Treatment System (IWTS), is designed to take and treat non-radioactive station waste waters. The NPDES Permit DSN for the IWTS is 107. The other section, the Industrial Wastewater Filtration System (IWFS) is designed to take and treat sludges generated by the station's River Water Pre-Treatment Building and from the IWTS's Air Flotation Separation Unit, filter out the solids and discharge the filtered water. The NPDES Permit DSN for the IWFS is 104. The filtered solids from the IWFS are hydraulically pressed and produce filter cake. Both DSN 104 and DSN 107 release treated effluent into the Main Station Discharge (DSN 001). The bypassing of DSN 103 and subsequent usage of the IWTS and IWFS for the collection, treatment and discharge of rainwater collected in the basins is now accepted procedure, by way of the station's NPDES Permit. DSN 103 is now considered an emergency or alternate bypass route.

It is proposed to continue the use of those methods of management and disposition of rainfall, referring to accumulated rainfall as leachate in the landfill, in the same manner as previously discussed above. Figure 1 shows a schematic of what will become the leachate treatment flowpath. As shown in the schematic, the treatment flowpath is a loop. Material removed from the filter cake in the landfill by rainfall leaching can be reconstituted into filter cake in the IWTS/IWFS treatment process or discharged via DSN 107 under permit conditions of the TMINS NPDES Permit (PA 0009920).



LIQUIDS PATHWAY

SOLIDS PATHWAY

MODULE No. 3

FIGURE 1

LEACHATE TREATMENT SCHEMATIC

ER-SWM-21
5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

INDUSTRIAL AND HAZARDOUS WASTE DISPOSAL SITES

MODULE NO. 7

DATE PREPARED: 03-27-85

IDENTIFICATION NO.: 3 0 1 0 2 9

PHASE I

A. Describe the waste(s) by origin, composition and volumes. Utilize Solid Waste Module No. 1 and attach such additional data as may be necessary.

B. Submit Solid Waste Form No. 1.

C. Submit Solid Waste Module No. 2 after consultation with the Regional Solid Waste Manager to determine extent of data required for Phase I.

D. Provide both a chemical analysis and a leaching analysis of the waste(s).

PHASE II

A. Submit Solid Waste Form No. 2.

B. Submit Solid Waste Module No. 3 if proposed site is to be lined.

1. Provide manufacturer's warranty of waste to liner compatibility or miscibility data from a 100 hour undiluted exposure test where documentation of compatibility is not available in literature.

C. Submit Solid Waste Module No. 7.

D. Submit Solid Waste Module No. 8.

PREPARED BY:

Engineer's Name D.K.Croneberger

Address 100 Interpace Parkway

Parsippany, New Jersey 07054

Telephone Number & Area Code: AC(201) 263-2031

Registration No. 10225E

Signature D K Croneberger

SEAL

ER-SWM-22 5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

GROUND WATER MODULE
MONITORING POINTS
MODULE NO. 8

I. D. NUMBER
3 0 1 0 2 9

PHASE II

Facility Identification

Name General Public Utilities Nuclear Co Reviewed by _____ Date _____

Municipality Londonderry Twp. Recommend approval _____ disapproval _____

County Dauphin Conditions _____

TO BE SUBMITTED ON COMPLETION OF GROUND WATER MONITORING SYSTEM

I. For approved monitoring sites complete the following:

A. Wells

1. Location

Monitoring Point Numbers*	Background or Down Gradient	Name and Date of Topographic Map	Measured from Southeast Corner		Latitude	Longitude
			Inches North	Inches West		
NW-1	Down Gradient	Middletown, Pa. Photo revised 1972	5.4	13.5	76°43'19"	40°09'17"
NW-2	Down Gradient	"	5.7	13.6	76°43'20"	40°09'21"
NW-3	Down Gradient	"	5.7	13.4	76°43'17"	40°09'21"
NW-4	Background	"	6.0	13.5	76°43'18"	40°09'25"

* Number all monitoring points consecutively. These numbers must not be changed; they will be used in all subsequent reports and communications (use numbers only.).

2. Completion Data

*Refer to Phase I Application, Exhibit E, p. 7-9

Monitoring Point Numbers*	Method Drilled	Date Completed	Depth	Surface Elevation	Depth to Static Water Level	Date of Measurement
NW-1	Hollow-stem Auger	7/10/84	31.5'	293.0'	11.4'	7/12/84
NW-2	"	7/10/84	31.0'	294.5'	10.8'	"
NW-3	"	7/12/84	45.0'	311.4'	30.2'	"
NW-4	"	7/11/84	31.5'	293.4'	12.4'	"

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

GROUND WATER MODULE
MONITORING POINTS
MODULE NO. 8

I. D. NUMBER
3 0 1 0 2 9

PHASE II

2. Completion Data (continued) **

Monitoring Point Numbers*	Casing: Material (Type)	Size Diameter	Zones Cased	Zones * Perforated	Grouting: Zones Grouted	Type of Grouting
NW-1						
NW-2						
NW-3						
NW-4						

**Refer to Plate 7 of Exhibit B, Phase I Application. This figure is representative for all four wells.

a. Does each well have a minimum of 3.5 inch diameter entrance port for samplers? ___ Yes X No

b. If the entrance port is not provided, indicate how samples of the upper foot of ground water will be secured. _____

_____

_____

* Number all monitoring points consecutively. These numbers must not be changed; they will be used in all subsequent reports and communications (use numbers only).

ER-SWM-228.5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

GROUND WATER MODULE
MONITORING POINTS
MODULE NO. 8

I. D. NUMBER
3 0 1 0 2 9

PHASE II

3. Pump Test Data N/A

Monitoring Point Number					
Use of water other than monitoring (fire, domestic, sanitary facilities, etc.)					
Pump					
Type					
Rated Capacity					
Depth to Pump (ft.)					
Depth to Water Intake (ft.)					
Pump Test Data					
Bailed or Pumped at (GPM-Uniform Rate)					
Static Water Level (prior to start of pumping) (ft.)					
Pumping Water Level (at end of pump test) (ft.)					
Drawdown (ft.)					
Length of Pump Test (hrs.)					
Specific Capacity (GPM/FT)					
Pumping Rate / Drawdown					

a. Are the required geologic logs attached for each well?

Yes ____ No X*

*Geologic logs for each well are included with Phase I Application, Appendix B.

ER-SWM-22C 3/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

DATE PREPARED
03-27-85

GROUND WATER MODULE
MONITORING POINTS
MODULE NO. 8

I. D. NUMBER
3 0 1 0 2 9

PHASE II

B. Springs N/A

1. Location

Monitoring Point Numbers*	Background or Down Gradient	Name & Date of Topographic Map	Measured from Southeast Corner		Latitude	Longitude
			Inches North	Inches West		

2. Flow Data

Monitoring Point Numbers*	Elevation of Discharge Point	Rate of Flow GPM	Date of Measurement

C. Others(s)

Monitoring Point Numbers*	Describe or explain	List Pertinent Information (Flow, Depth to Ground Water, Elevations, etc.)

*Monitoring point numbers should be numbered consecutively. Example: Wells 1, 2, 3; springs 4, 5, 6; others 7, 8.

ER-SWM-220 5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

SANITARY LANDFILL
CHEMICAL ANALYSIS QUARTERLY REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

I.D. Number 301029

Monitoring point number NW-1 (south) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 19" Longitude 40° 09' 17"

Date sample collected 2/12/85 Time 10:45

Spring flow cu. ft/sec. N/A*

Depth to water level 16.25 feet

Sampling Depth NA** feet

Type of sample (check one) pump ____ bailer X

pH (00403) 6.01

Alkalinity (mg/l) (00410) 84.0

Total Iron (ug/l) (01045) 23250

Sulfates (mg/l) (00945) 88.9

Total Solids (mg/l) (00500) 1464

Chlorides (mg/l) (00940) 17.86

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 34.0

Specific Conductance (Micromhos) (00095) 406

For metals check one: 1. Standard method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

*N/A - Not Applicable
**NA - Data Not Available

ER-SWM-220 5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

SANITARY LANDFILL
CHEMICAL ANALYSIS QUARTERLY REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

I.D. Number 301029

Monitoring point number NW-2 (west) Check one: spring ____ well X

Monitoring point location: Latitude 76 ° 43 ' 20" Longitude 40° 09' 21"

Date sample collected 2/12/85 Time 10:20

Spring flow cu. ft/sec. N/A

Depth to water level 17.80 feet

Sampling Depth NA feet

Type of sample (check one) pump ____ bailer X

pH (00403) 5.98

Alkalinity (mg/l) (00410) 69.2

Total Iron (ug/l) (01045) 84250

Sulfates (mg/l) (00945) 152.3

Total Solids (mg/l) (00500) 3523

Chlorides (mg/l) (00940) 27.52

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 89

Specific Conductance (Micromhos) (00095) 507

For metals check one: 1. Standard method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

FR-SWM-120 6/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

SANITARY LANDFILL
CHEMICAL ANALYSIS QUARTERLY REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

I.D. Number 301029

Monitoring point number NW-3 (east) Check one: spring ____ well X

Monitoring point location: Latitude 76 ° 43 ' 17" Longitude 40 ° 09 ' 21"

Date sample collected 2/12/85 Time 9:15

Spring flow cu. ft/sec. N/A

Depth to water level 31.33 feet

Sampling Depth NA feet

Type of sample (CHECK ONE) pump ____ bailer X

pH (00403) 6.12

Alkalinity (mg/l) (00410) 49.5

Total Iron (ug/l) (01045) 139500

Sulfates (mg/l) (00945) 81.1

Total Solids (mg/l) (00500) 5838

Chlorides (mg/l) (00940) 16.9

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 117

Specific Conductance (Micromhos) (00095) 325

For metals check one: 1. Standard method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

SANITARY LANDFILL
CHEMICAL ANALYSIS QUARTERLY REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

I.D. Number 301029

Monitoring point number NW-4 (north) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 18" Longitude 40° 09' 25"

Date sample collected 2/12/95 Time 9:50

Spring flow cu. ft/sec. N/A

Depth to water level 17.40 feet

Sampling Depth NA feet

Type of sample (CHECK ONE) pump ____ bailer X

pH (00403) 5.94

Alkalinity (mg/l) (00410) 43.3

Total Iron (ug/l) (01045) 24000

Sulfates (mg/l) (00945) 235.4

Total Solids (mg/l) (00500) 1676

Chlorides (mg/l) (00940) 38.14

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 24

Specific Conductance (Micromhos) (00095) 688

For metals check one: 1. Standard method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

ER-6[illegible] 228 9/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

CHEMICAL ANALYSIS ANNUAL REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

Facility Number 301029

Check one: Sanitary Landfill X Spray Irrigation ____ Other ____

Describe ____

Monitoring point number NW-1 (south) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 19" Longitude 40° 09' 17"

Date sample collected 2/12/85 Time 10:45

Spring flow cu. ft/sec. N/A*

Depth to water level 16.25 feet

Sampling Depth NA** feet

Type of sample (CHECK ONE) pump ____ bailer X

Temperature (Degrees C) (00010) 10.2

pH (00403) 6.01

Alkalinity (mg/l) (00410) 84.0

Total Iron (ug/l) (01045) 29250

Manganese (ug/l) (01054) 1350

Aluminum (ug/l) (01105) 22630

Chlorides (mg/l) (00940) 17.86

Fluorides (mg/l) (00950) <0.1

Other Analysis Required

Albuminoid Nitrogen (mg/l) (00639) NA

Ammonia Nitrogen (mg/l) (00610) <0.1

Ortho Phosphates reported as P(mg/l) (70507) 0.034

Nitrate-Nitrogen (mg/l) (00615) 3.60

Nitrite-Nitrogen (mg/l) (00620) 0.011

Total Solids (mg/l) (00500) 1464

Suspended Solids (mg/l) (00530) 1040

Settleable Solids (ml/100 ml) (00545) 8 ml/l

TOC 19 mg/l

BOD 5 day (mg/l) (00310) NA

COD 25n $K_2Cr_2O_7$ (mg/l) (00340) 34.0

Specific Conductance (micromhos) (00905) 406

For Fluorides check one: 1. Standard Method ____ or 2. Selective ion probe X

For Metals check one: 1. Standard Method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

*N/A - Not Applicable
**NA - Data Not Available

ER-SWM-228 3/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

CHEMICAL ANALYSIS ANNUAL REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

Facility Number 301029

Check one: Sanitary Landfill X Spray Irrigation ____ Other ____

Describe ____

Monitoring point number NW-2 (west) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 20" Longitude 40° 09' 21"

Date sample collected 2/12/85 Time 10:20

Spring flow cu. ft/sec. N/A

Depth to water level 17.80 feet

Sampling Depth NA feet

Type of sample (CHECK ONE) pump ____ bailer X

Temperature (Degrees C) (00010) 8.8

pH (00403) 5.98

Alkalinity (mg/l) (00410) 69.2

Total Iron (ug/l) (01045) 84250

Manganese (ug/l) (01054) 6330

Aluminum (ug/l) (01105) 52380

Chlorides (mg/l) (00940) 27.52

Fluorides (mg/l) (00950) <0.1

Other Analysis Required

Albuminoid Nitrogen (mg/l) (00639) NA

Ammonia Nitrogen (mg/l) (00610) <0.1

Ortho Phosphates reported as P(mg/l) (70507) 0.046

Nitrate-Nitrogen (mg/l) (00615) 3.30

Nitrite-Nitrogen (mg/l) (00620) 0.004

Total Solids (mg/l) (00500) 3522

Suspended Solids (mg/l) (00530) 3010

Settleable Solids (ml/100 ml) (00545) 33 ml/l

TOC 37 mg/l

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 89

Specific Conductance (micromhos) (00905) 507

For Fluorides check one: 1. Standard Method ____ or 2. Selective ion probe X

For Metals check one: 1. Standard Method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

ER-SWM-228 9/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

CHEMICAL ANALYSIS ANNUAL REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

Facility Number 301029

Check one: Sanitary Landfill X Spray Irrigation ____ Other ____

Describe ____

Monitoring point number NW-3 (east) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 17" Longitude 40° 09' 21"

Date sample collected 2/12/85 Time 9:15

Spring flow cu. ft/sec. N/A

Depth to water level 31.33 feet

Sampling Depth NA feet

Type of sample (check one) pump ____ bailer X

Temperature (Degrees C) (00010) 11.7

pH (00403) 6.12

Alkalinity (mg/l) (00410) 49.5

Total Iron (ug/l) (01045) 189500

Manganese (ug/l) (01054) 8300

Aluminum (ug/l) (01105) 90750

Chlorides (mg/l) (00940) 16.9

Fluorides (mg/l) (00950) <0.1

Other Analysis Required

Albuminoid Nitrogen (mg/l) (00639) NA

Ammonia Nitrogen (mg/l) (00610) < 0.1

Ortho Phosphates reported as P(mg/l) (70507) 0.022

Nitrate-Nitrogen (mg/l) (00615) 2.88

Nitrite-Nitrogen (mg/l) (00620) 0.022

Total Solids (mg/l) (00500) 5838

Suspended Solids (mg/l) (00530) 5500

Settleable Solids (ml/100 ml) (00545) 48 ml/l

TOC 48 mg/l

BOD 5 day (mg/l) (00310) NA

COD 25n $K_2Cr_2O_7$ (mg/l) (00340) 117

Specific Conductance (micromhos) (00905) 325

For Fluorides check one: 1. Standard Method ____ or 2. Selective ion probe X

For Metals check one: 1. Standard Method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

ER-SWM-226 5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

CHEMICAL ANALYSIS ANNUAL REPORT

Facility Name GPU Nuclear Three Mile Island County Dauphin Municipality Londonderry

Facility Number 301029

Check one; Sanitary Landfill X Spray Irrigation ____ Other ____

Describe ____

Monitoring point number NW-4 (north) Check one: spring ____ well X

Monitoring point location: Latitude 76° 43' 18" Longitude 40° 09' 25"

Date sample collected 2/12/85 Time 9:50

Spring flow cu. ft/sec. N/A

Depth to water level 17.40 feet

Sampling Depth NA feet

Type of sample (check one) pump ____ bailer X

Temperature (Degrees C) (00010) 10.1

pH (00403) 5.94

Alkalinity (mg/l) (00410) 43.3

Total Iron (ug/l) (01045) 24000

Manganese (ug/l) (01054) 1050

Aluminum (ug/l) (01105) 16880

Chlorides (mg/l) (00940) 38.14

Fluorides (mg/l) (00950) < 0.1

Other Analysis Required

Albuminoid Nitrogen (mg/l) (00639) NA

Ammonia Nitrogen (mg/l) (00610) < 0.1

Ortho Phosphates reported as P(mg/l) (70507) 0.032

Nitrate-Nitrogen (mg/l) (00615) 5.80

Nitrite-Nitrogen (mg/l) (00620) 0.005

Total Solids (mg/l) (00500) 1675

Suspended Solids (mg/l) (00530) 1080

Settleable Solids (ml/100 ml) (00545) 6 ml/l

TOC 11 mg/l

BOD 5 day (mg/l) (00310) NA

COD .25n $K_2Cr_2O_7$ (mg/l) (00340) 24

Specific Conductance (micromhos) (00905) 688

For Fluorides check one: 1. Standard Method ____ or 2. Selective ion probe X

For Metals check one: 1. Standard Method ____ or 2. Atomic absorption X

Name and address of laboratory performing chemical analyses:

GPU Laboratory Services
P. O. Box 1018
Reading, Pa. 19603

ER-SWM-12
5/79

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT

CERTIFICATION OF FACILITY DESIGN AND CONSTRUCTION

FORM NO. 6

I, D.K.Croneberger, being a Registered Professional Engineer in accordance with the Pennsylvania Professional Engineer's Registration Law do hereby certify that to the best of my knowledge, information and belief that the:

(Engineer's Name - Print or Type)

FACILITY NAME: Filter Cake Disposal Landfill at TMINS

FACILITY LOCATION: Londonderry Twp. (Municipality) Dauphin (County)

is constructed, and prepared in accordance with the documents, statements, designs, and plans submitted as part of Application No. 301029 as approved by the Department of Environmental Resources.

Engineer's Signature D.K.Croneberger

Name of Firm General Public Utilities Nuclear Corporation

Address: 100 Interpace Parkway
Parsippany, New Jersey 07054

Telephone Number: AC (201) 263-2031

Date: 3-27-85

(SEAL)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF SOLID WASTE MANAGEMENT
One Ararat Boulevard
Harrisburg, Pennsylvania 17110
(717) 657-4588

February 25, 1985

5290-15-3003

Mr. Thomas A. Grace
Environmental Licensing Engineer
GPU Nuclear Corporation
P. O. Box 480
Route 441 South
Middletown, PA 17057

Re: Solid Waste Disposal Site
Application No. 301029
Three Mile Island
Londonderry Township, Dauphin County

Dear Mr. Grace:

The Phase I application for the above referenced facility has been approved by the Department. Please submit your Phase II application within forty-five (45) days of the date of this letter.

If you have any questions or concerns involving the submission of the Phase II application, please feel free to contact this office.

Sincerely,

Robert G. Benvin

Robert G. Benvin
Facilities Supervisor
Harrisburg Regional Office

RGB:flw