Report.BCP.C426027.2.03.1987

Phase I investigation

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BUREAU OF HAZARDOUS SITE CONTROL
DIVISION OF SOLID AND
HAZARDOUS WASTE

EA SCIENCE AND
TECHNOLOGY

A Division of EA Engineering, Science, and Technology, Inc.

EA REPORT CHG61A

PHASE I INVESTIGATION

CATSKILL COAL GASIFICATION PLANT SITE
TOWN OF CATSKILL
GREENE COUNTY, NEW YORK

Prepared for

Central Hudson Gas & Electric Corporation
284 South Avenue
Poughkeepsie, New York 12601

Prepared by

EA Science and Technology
R.D. 2, Goshen Turnpike
Middletown, New York 10940

A Division of EA Engineering, Science, and Technology, Inc.

January 1987

CONTENTS

1. Executive Summary

1. EXECUTIVE SUMMARY

The Catskill Coal Gasification Plant (Catskill Gas Plant or Catskill Gas Works) site (New York I.D. No. "unlisted", EPA I.D. No. NYD980531826) is located along Water Street in the Village of Catskill, Greene County, New York (Figures 1-1 and 1-2 and Photos 1-1 through 1-10). The site is comprised of three separate areas upon which two gas manufacturing facilities operated during two different periods in time. The northernmost area (Area C in Figure 1-2) is currently owned by the First National Bank of Boston and is currently a paved parking lot to J.J. Newberry Department Store. A second area (Area A), adjacent to an old foundry building, is owned by Ms. Barbara MacDonald of Catskill. The third area (Area B), the former location of a gas holding tank, is currently owned by Carl and Eva Yannoe of Catskill. The three parcels encompass a combined total area of approximately 3.7 acres.

The first plant which operated at this site was located at Area A (Figure 1-2). This facility utilized a carbonization process to manufacture gas from coal until the early 1900s. The gas manufactured by this facility was stored in a holding tank formerly located at Area B. This plant was constructed and operated by the Catskill Illuminating and Power Company. Around 1905, this plant was sold to the Upper Hudson Electric and Railroad Company who operated the plant until 1923. In the early 1920s, Upper Hudson Electric and Railroad Company constructed a new coal gas plant (at Area C) and changed processes to water gas production. In 1925, Upper Hudson Electric and Railroad Company sold the old gas plant property (Area A) to the Catskill Foundry and Machine Works. During the same year, Central Hudson Gas & Electric Company acquired the newly constructed gas plant (Area C). Central Hudson Gas & Electric Company consolidated with several other gas manufacturing companies to form Central Hudson Gas & Electric Corporation (CHG&E) in 1926. CHG&E converted the coal gas plant to a butane/air/gas operation in 1932. CHG&E operated this plant from 1932 until 1958. In 1958, a new natural gas transmission line became available and the butane/air/gas plant was no longer necessary. Therefore, the plant was disassembled, and property and equipment were sold.

On 27 June 1986, the U.S. EPA completed a "Potential Hazardous Waste Site Preliminary Assessment" of the former Catskill Gas Plant site. No indication of significant waste disposal activities were found as a result of this assessment, and no further actions were recommended.

On 3 September 1986, EA performed an inspection of the former Catskill Gas Plant site, and no evidence of coal gas manufacturing wastes or hazardous chemical compounds was observed, although no samples were taken from the site environs at that time. During the site inspection, a photoionization detector was used to measure for volatile organics in the air. No readings above background levels were obtained in the breathing zone.

EA has researched all pertinent agency files, interviewed CHG&E personnel who were potentially knowledgeable about this site, conducted a site inspection, and has found no documented hazardous waste or contamination at this site. Therefore, because the EPA Hazardous Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there is no documented hazardous waste or contamination in this case, it is not appropriate to provide a Hazard Ranking Score (or documentation) for this site.

In order to prepare a final HRS score for this site, analytical data regarding the quality of the ground water, surface water, soil, and sediment will be necessary, thus requiring performance of a Phase II investigation. The proposed Phase II study would include performance of a soil vapor survey, the installation of 7 observation wells, and the collection and analysis of ground-water, surface water, soil, and sediment samples.

Site Coordinates:

Latitude:	42° 13' 10"
Longitude:	73° 51' 57"

CATSKILL COAL GAS PLANT

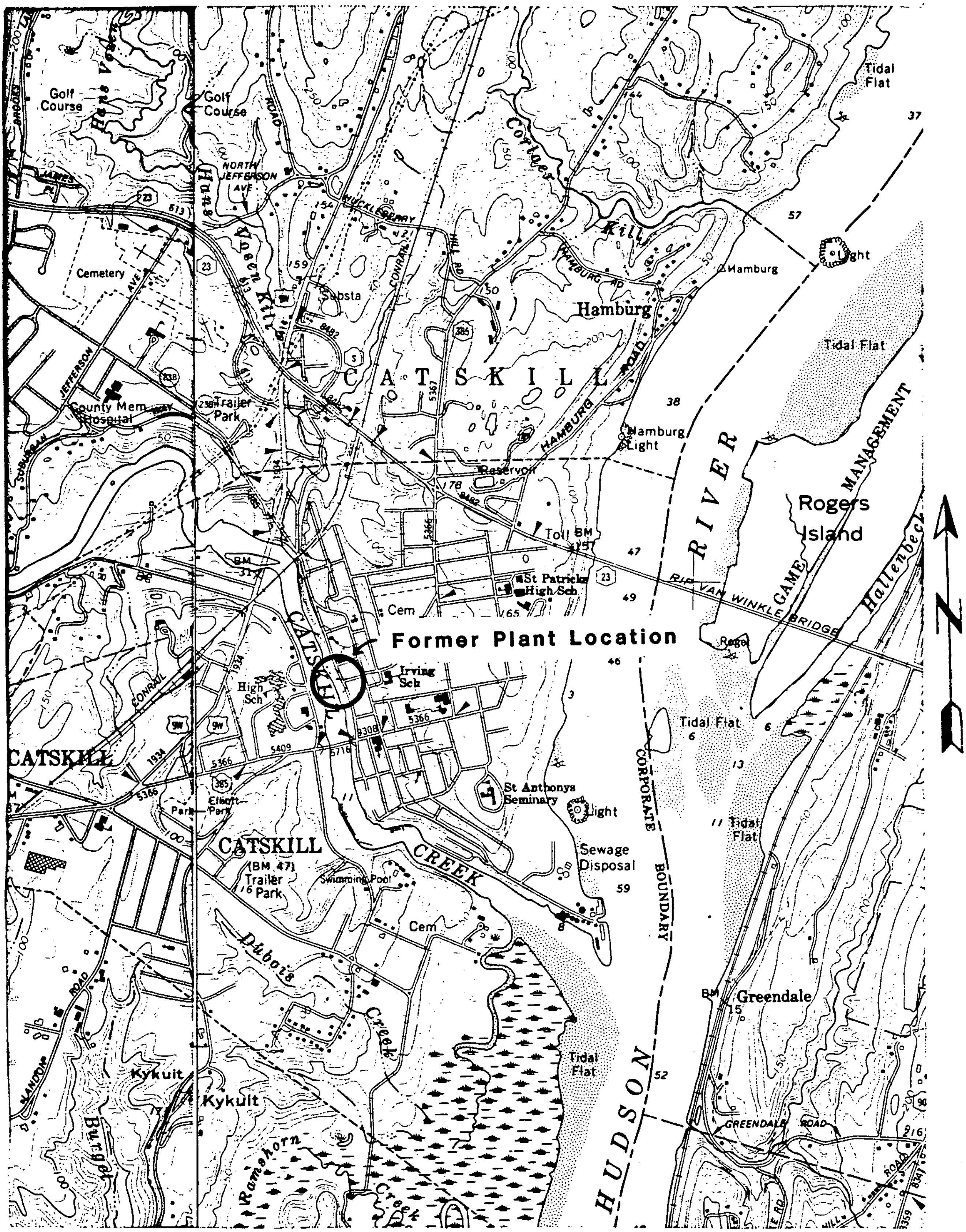


Figure 1-1. Site Locator Map.

Hudson South Quad
NYSDOT 7.5-Minute Series
Dated 1976
Scale 1:24,000

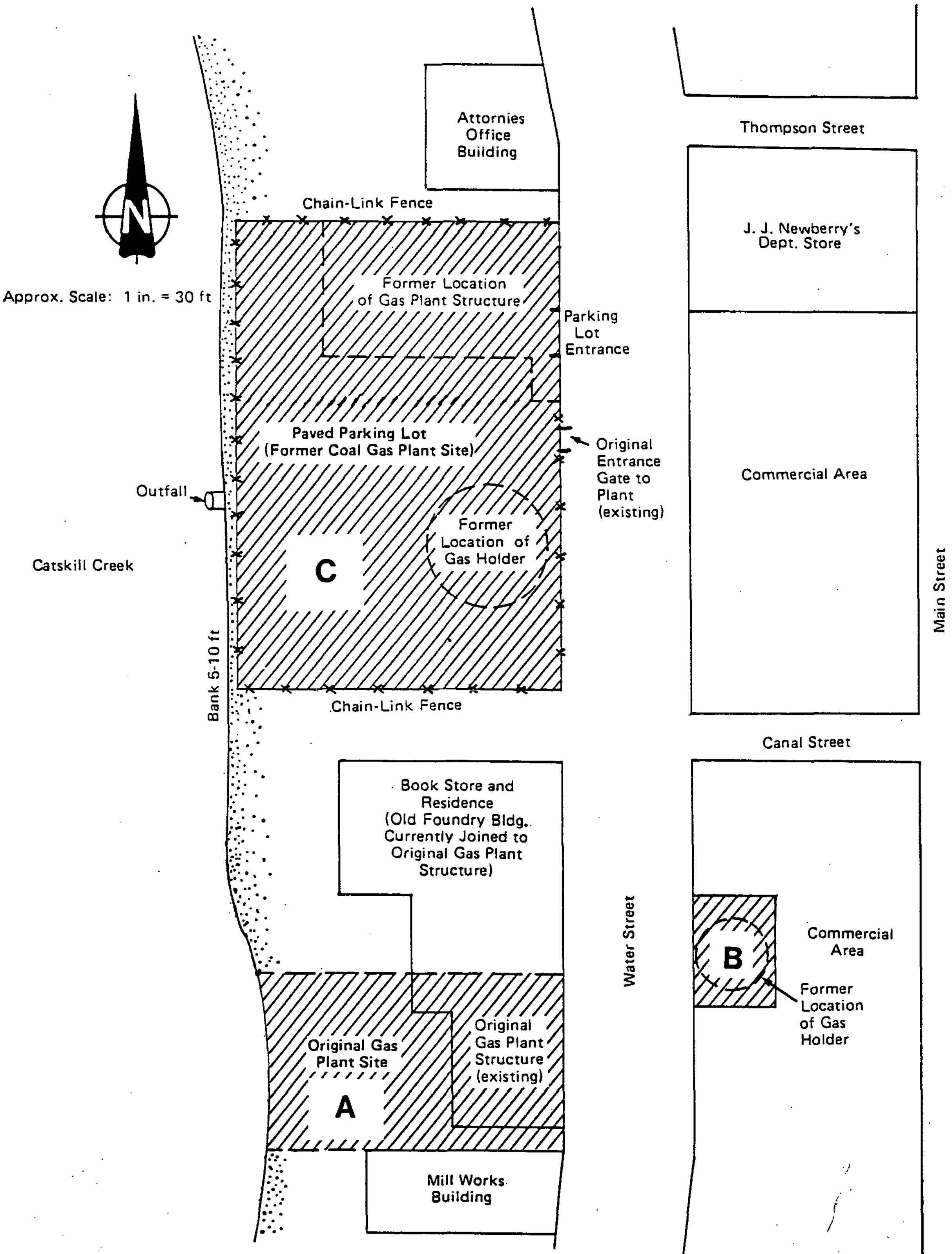
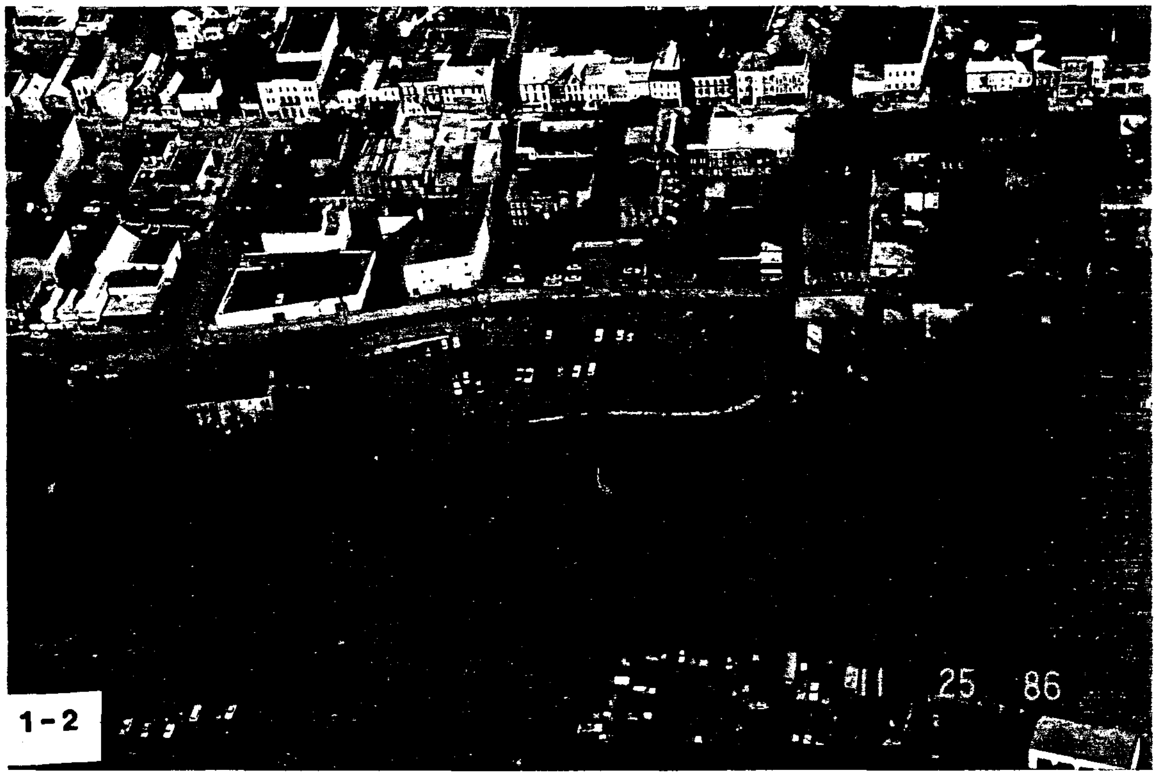
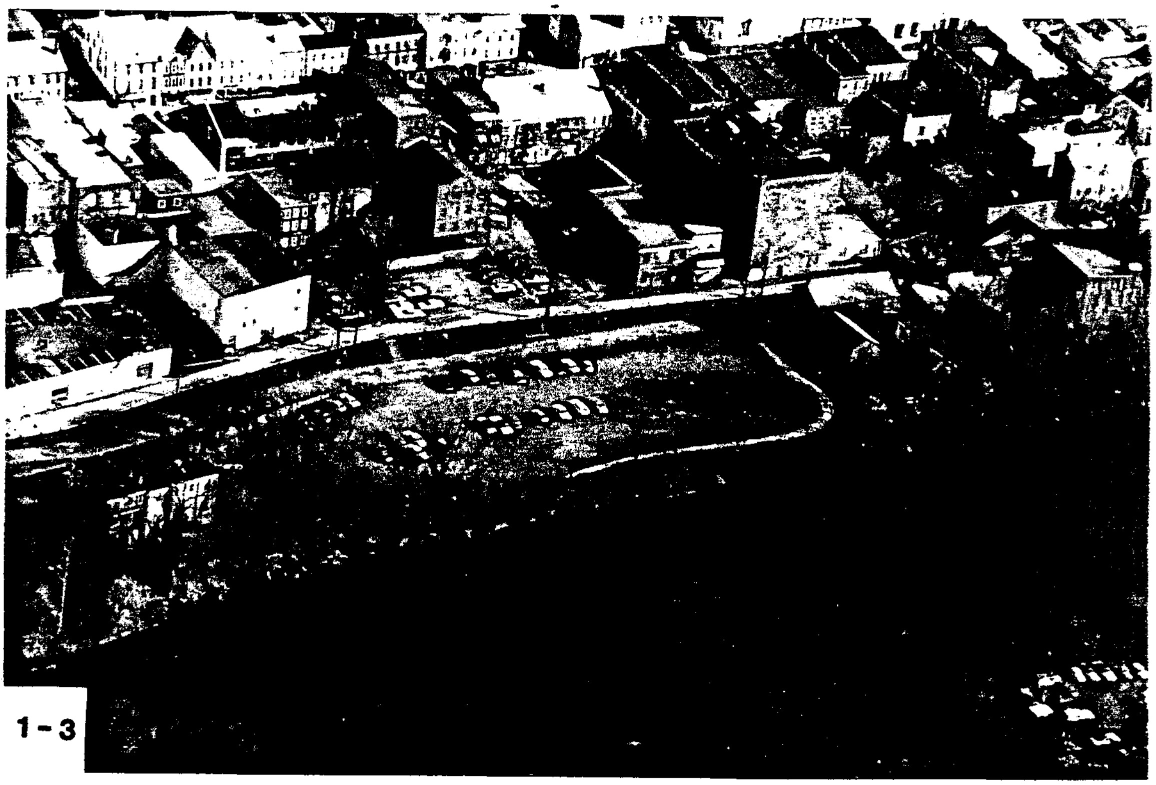


Figure 1-2. Sketch of the former Catskill Gas Plant site.

1-1

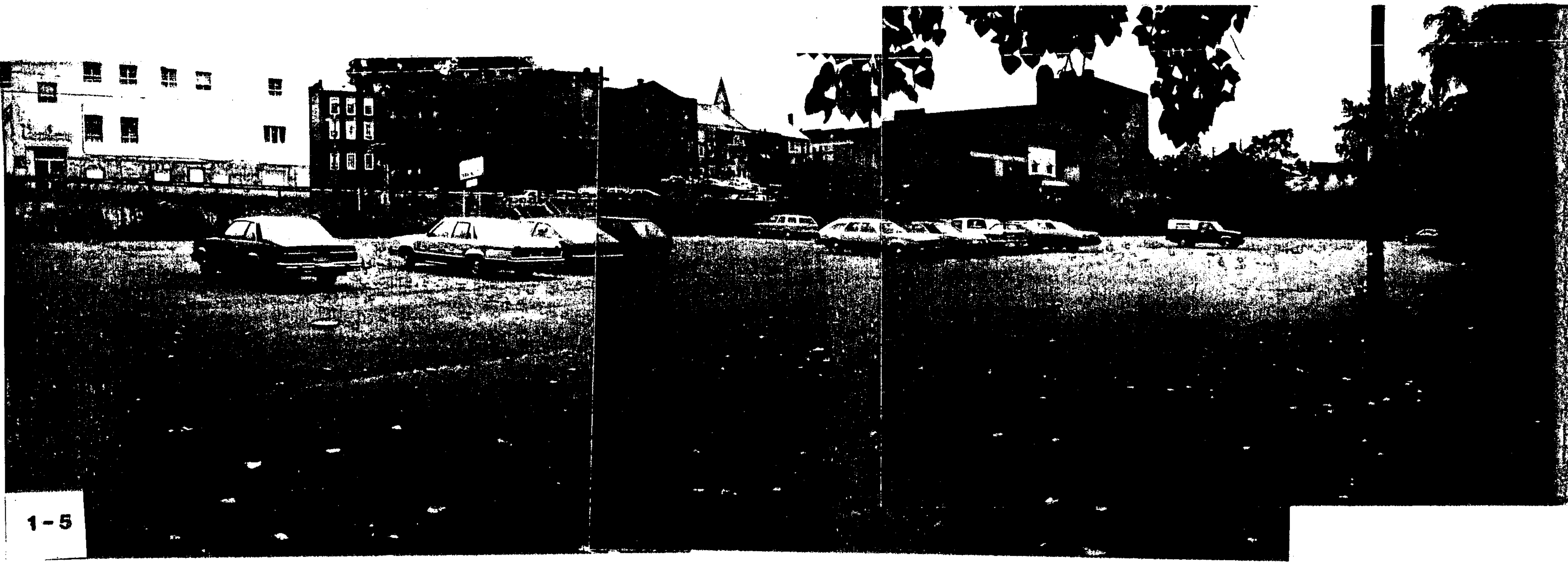


1-2



1-3

1-4



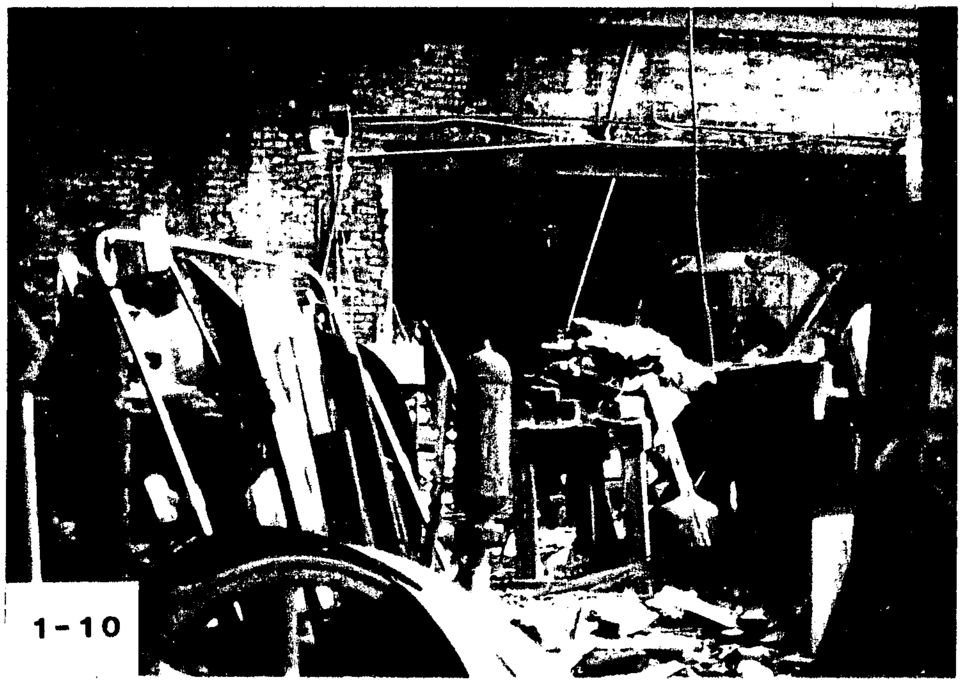
1-5

1-6

1-7

1-8

1-9



1-10

NUS CORPORATION
A Halliburton Company

Region 4

02-8606-12-PA

POTENTIAL HAZARDOUS WASTE SITE

PRELIMINARY ASSESSMENT

COMPLETED

Central Hudson G & E/
Catskill Gas Plant
Site Name

NYD980531826
EPA Site ID Number

Water Street
Village of Catskill, NY 12414
Address

02-8606-12
TDD Number

Date of Site Visit: Off-site Reconnaissance Conducted, 6/27/86.

SITE DESCRIPTION

The site is a former natural gas plant. The plant was owned by Central Hudson G & E Corporation and operated until 1930. The company reported a possibility of waste spillage during operation of the plant. There is no other known waste disposal on-site.

The area of the former site is presently a completely paved area used by Newberry as a store parking lot. The site is located between Water Street and the Catskill Creek just west of the center of town in a primarily commercial area. The Catskill Creek, which is used for fishing and boating, flows along the western boarder of the parking lot. The area of the site shows no evidence of the former plant or any waste associated with it.

PRIORITY FOR FURTHER ACTION: High ___ Medium ___ Low ___ None X

RECOMMENDATIONS

A site inspection is not recommended. The site is completely covered with pavement and has no documented evidence of any significant waste disposal.

Prepared by: Stephen Maybury
of NUS Corporation

Date: 7/15/86

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY D980531826

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)
Central Hudson G & E/Catskill Gas Plant

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Water Street

03 CITY
Village of Catskill

04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST.
NY	12414	Greene	039	29

09 COORDINATES
LATITUDE 4 2° 1 3' 1 3". N
LONGITUDE 0 7 3° 5 2' 0 3". W

10 DIRECTIONS TO SITE (Starting from nearest public road)
Take Rt. 23 to Spring Street (Rt. 385) toward the Village of Catskill. Turn right onto Bridge Street. Turn right onto Water Street at its intersection. The Newberry parking lot is on the left side.

III. RESPONSIBLE PARTIES

01 OWNER (if known)
Central Hudson G & E Corporation

02 STREET (Business, mailing, residential)
284 South Avenue

03 CITY
Poughkeepsie

04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
NY	12602	(914) 452-2000

07 OPERATOR (if known and different from owner)
J.J. Newberry Co.

08 STREET (Business, mailing, residential)
403-411 Main St.

09 CITY
Catskill

10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
NY	12414	(518) 943-3230

13 TYPE OF OWNERSHIP (Check one)
X A. PRIVATE
___ B. FEDERAL: ________ (Agency name)
___ C. STATE
___ D. COUNTY
___ E. MUNICIPAL
___ F. OTHER: ________ (Specify)
___ G. UNKNOWN

14. OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
___ A. RCRA 3001 DATE RECEIVED: / /
X B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: 6 / 9 / 81
___ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
___ YES DATE: / /
X NO

BY (Check all that apply)
___ A. EPA
___ B. EPA CONTRACTOR
___ C. STATE
___ D. OTHER CONTRACTOR
___ E. LOCAL HEALTH OFFICIAL
___ F. OTHER: ________ (Specify)

CONTRACTOR NAME(S): ________

02 SITE STATUS (Check one)
___ A. ACTIVE
X B. INACTIVE
___ C. UNKNOWN

03 YEARS OF OPERATION
Unknown (BEGINNING) 1930 (ENDING)
___ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
There is no known waste on-site. There is slight potential that coal tar may have been spilled during the plants operation prior to 1930.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
There is minimal potential that any waste on-site would still be available for migration. The area where the plant is believed to have been located is completely paved. The Catskill Creek which lies on the western boarder of the parking lot is used for fishing and boating. Groundwater is used for drinking in the area.

IV. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste information and Part 3 - Description of Hazardous Conditions and Incidents)
___ A. HIGH (Inspection required promptly)
___ B. MEDIUM (Inspection required)
___ C. LOW (Inspection on time available basis)
X D. NONE (No further action needed. complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Diana Messina	U.S. EPA Region II	(201) 321-6685

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Stephen E. Maybury		NUS Corp.	(201) 225-6160	7 /15 /86

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION
01 STATE: NY
02 SITE NUMBER: D980531826

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

☐ A. SOLID
☐ B. POWDER, FINES
☐ C. SLUDGE
☒ D. OTHER: Unknown
(Specify)
☐ E. SLURRY
☐ F. LIQUID
☐ G. GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)
TONS Unknown
CUBIC YARDS ______
NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

☐ A. TOXIC
☐ B. CORROSIVE
☐ C. RADIOACTIVE
☐ D. PERSISTENT
☐ E. SOLUBLE
☐ F. INFECTIOUS
☐ G. FLAMMABLE
☐ H. IGNITABLE
☐ I. HIGHLY VOLATILE
☐ J. EXPLOSIVE
☐ K. REACTIVE
☐ L. INCOMPATIBLE
☐ M. NOT APPLICABLE
☒ Unknown

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			Spillage may have occurred during operation of the coal gasification plant.
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Unknown				

FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	Coal		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (See specific references. e.g., state files, sample analysis, reports)

Notification of Hazardous Waste Site (103C) 6/9/86.

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

1. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY D980531826

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION 02 _ OBSERVED (DATE: ________) X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Unknown 04 NARRATIVE DESCRIPTION

There is minimal potential. There is no known significant waste disposal on-site but some waste spillage may have occurred during operation of the plant prior to 1930. Groundwater is used for drinking in the area.

01. X B. SURFACE WATER CONTAMINATION 02 _ OBSERVED (DATE: ________) X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Unknown 04 NARRATIVE DESCRIPTION

There is minimal potential. The Catskill Creek flows along the western border of the site. Groundwater from the site could possibly discharge into surface water.

01 _ C. CONTAMINATION OF AIR 02 _ OBSERVED (DATE: ________) _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

There is no potential. Waste, if present, is buried beneath the pavement.

01. _ D. FIRE/EXPLOSIVE CONDITIONS 02 _ OBSERVED (DATE: ________) _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

There is no potential. Any waste on-site is buried beneath pavement and probably in small quantities due to spillage.

01. _ E. DIRECT CONTACT 02 _ OBSERVED (DATE: ________) _ POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

There is no potential. Any waste on-site is buried beneath pavement.

01 X F. CONTAMINATION OF SOIL 02 _ OBSERVED (DATE: ________) X POTENTIAL _ ALLEGED
03 AREA POTENTIALLY AFFECTED: Unknown (ACRES) 04 NARRATIVE DESCRIPTION

There is potential. The entire plant site is currently covered with pavement. Spillage may have occurred during the operation of the plant.

01. X G. DRINKING WATER CONTAMINATION 02 _ OBSERVED (DATE: ________) X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 443 04 NARRATIVE DESCRIPTION

There is minimal potential. There is no known significant disposal on-site. Several non municipal community sources use groundwater within three miles of the site. The Village of Catskill drinking water is supplied from the Potuck Reservoir located approximately seven miles from the site.

01 _ H. WORKER EXPOSURE/INJURY 02 _ OBSERVED (DATE: ________) _ POTENTIAL _ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: 0 04 NARRATIVE DESCRIPTION

There are no workers on-site.

01 X I. POPULATION EXPOSURE/INJURY 02 _ OBSERVED (DATE: ________) X POTENTIAL _ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Unknown 04 NARRATIVE DESCRIPTION

There is minimal potential due to the slight possibility of contamination of groundwater and the adjacent Catskill Creek. The Catskill Creek is used for recreational fishing and boating.

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY D980531826

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 _ J. DAMAGE TO FLORA 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

There is no potential. Any waste on-site is beneath pavement and therefore unavailable to flora.

01 _ K. DAMAGE TO FAUNA 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

There is no potential. Waste, if present, is not available to fauna.

01 _ L. CONTAMINATION OF FOOD CHAIN 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

There is no potential. Waste, if present, is not available to the food chain.

01 _ M. UNSTABLE CONTAINMENT OF WASTES 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
(Spills/runoff/standing liquids/leaking drums)
03 POPULATION POTENTIALLY AFFECTED: ____ 04 NARRATIVE DESCRIPTION

Any waste on-site is due to spillage during plant operations. The area is covered with pavement.

01 _ N. DAMAGE TO OFFSITE PROPERTY 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

There is minimal potential. Any waste on-site is covered with pavement and therefore unavailable for overland migration. There is a slight possibility of groundwater migration to off-site property.

01 _ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

There is no potential. Any waste, if present, is unavailable for migration.

01 _ P. ILLEGAL/UNAUTHORIZED DUMPING 02 _ OBSERVED (DATE: ____) _ POTENTIAL _ ALLEGED
04 NARRATIVE DESCRIPTION

There is no known dumping on-site.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

There are no other known hazards.

III. TOTAL POPULATION POTENTIALLY AFFECTED: Unknown

IV. COMMENTS

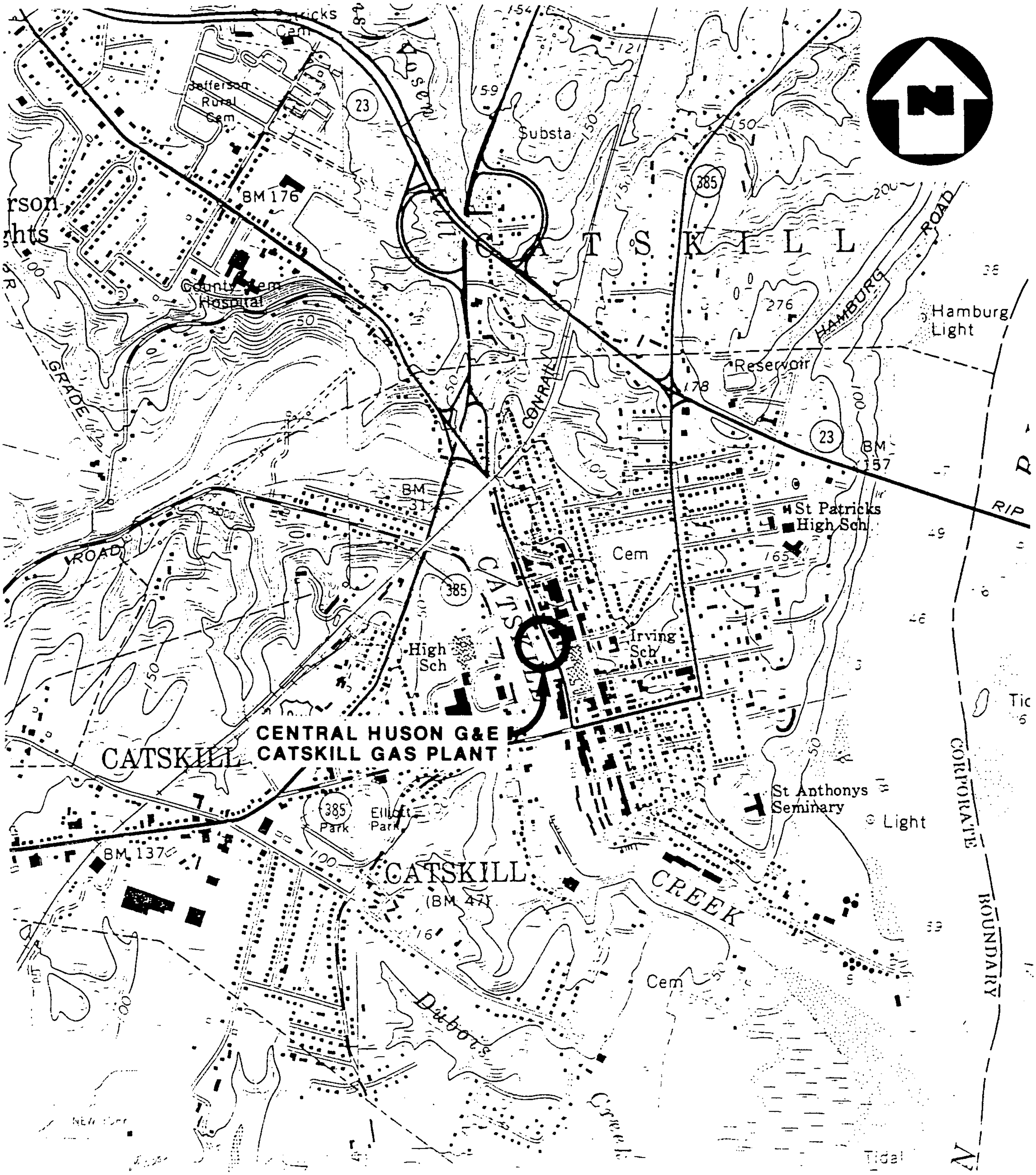
Any possible waste on-site has probably either leached away with time or was removed during the excavation for the parking lot and the demolition of the gas plant.

V. SOURCES OF INFORMATION (Cite specific references. e.g., state files, sample analysis, reports)

Off-site Reconnaissance by FIT II on 6/27/86.
Telecon between Stephen Maybury and Collen Darling on 6/27/86, 7-28-86.
Telecon between Stephen Maybury and Gary Johnston on 6/24/86.
Telecon between Denice Taylor and Joe Spytko on 7-1-86.
N.Y. State Atlas of Community Water Sources, 1982.

APPENDIX A

MAPS AND PHOTOGRAPHS



(QUAD) HUDSON SOUTH, N.Y.

FIGURE 1

SITE LOCATION MAP
CENTRAL HUDSON G&E CATSKILL GAS PLANT
VILLAGE OF CATSKILL, N.Y.

(NOT TO SCALE)

NUS CORPORATION
A Halliburton Company

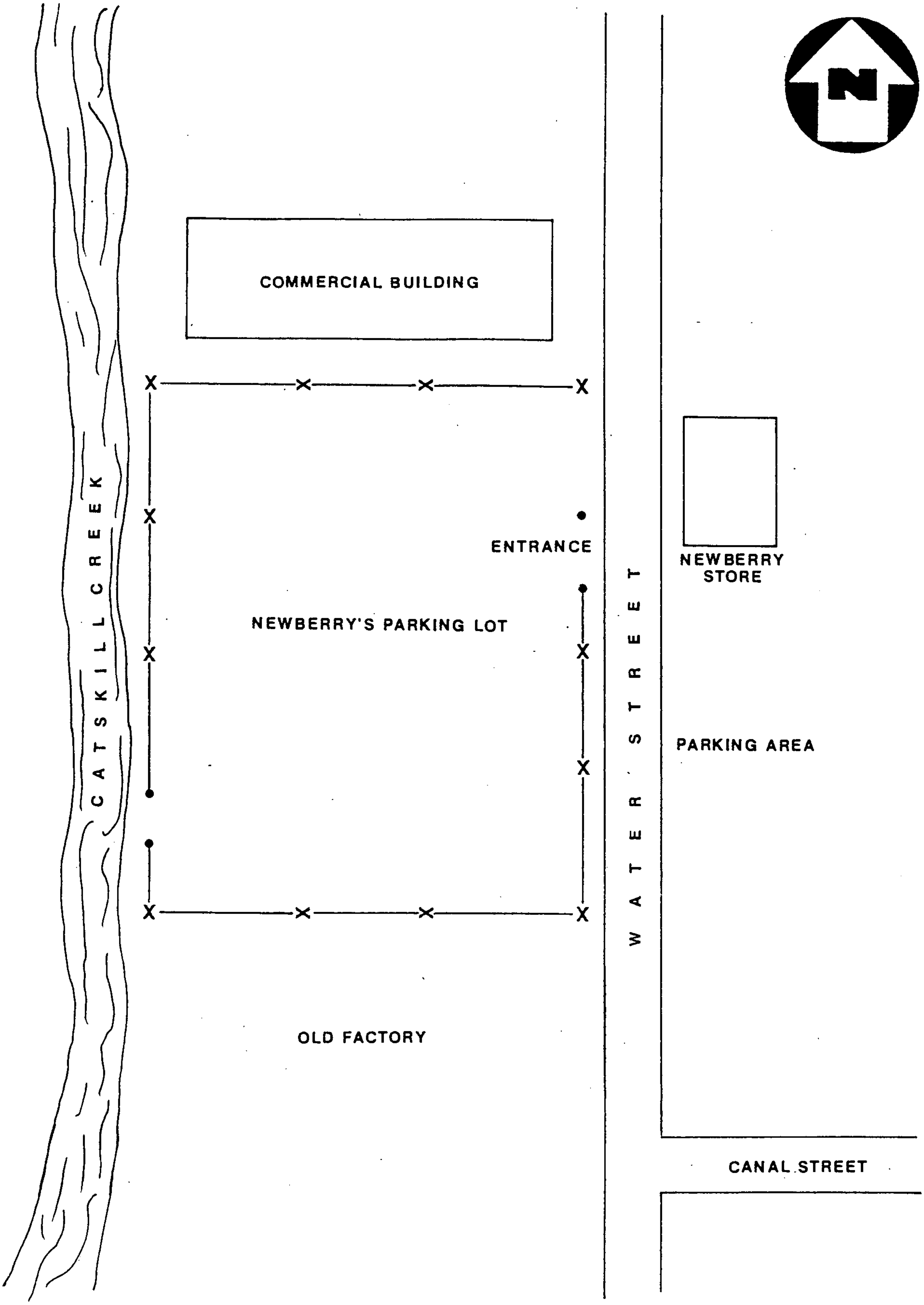


FIGURE 2

CENTRAL HUDSON G&E/CATSKILL PLANT
CATSKILL, N.Y.

(NOT TO SCALE)

NUS CORPORATION
A Halliburton Company

CENTRAL HUDSON G&E/CATSKILL GAS PLANT
CATSKILL, NEW YORK
TDD# 02-8606-12
JUNE 27, 1986

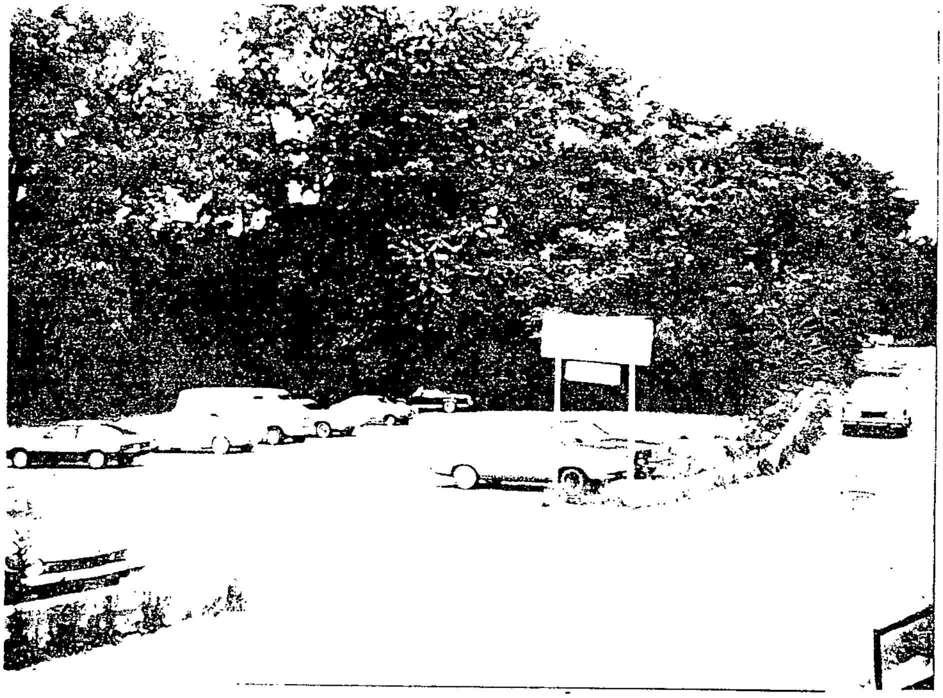
PHOTOGRAPH INDEX

CENTRAL HUDSON G&E/CATSKILL GAS PLANT
CATSKILL, NEW YORK
TDD# 02-8606-12
JUNE 27, 1986

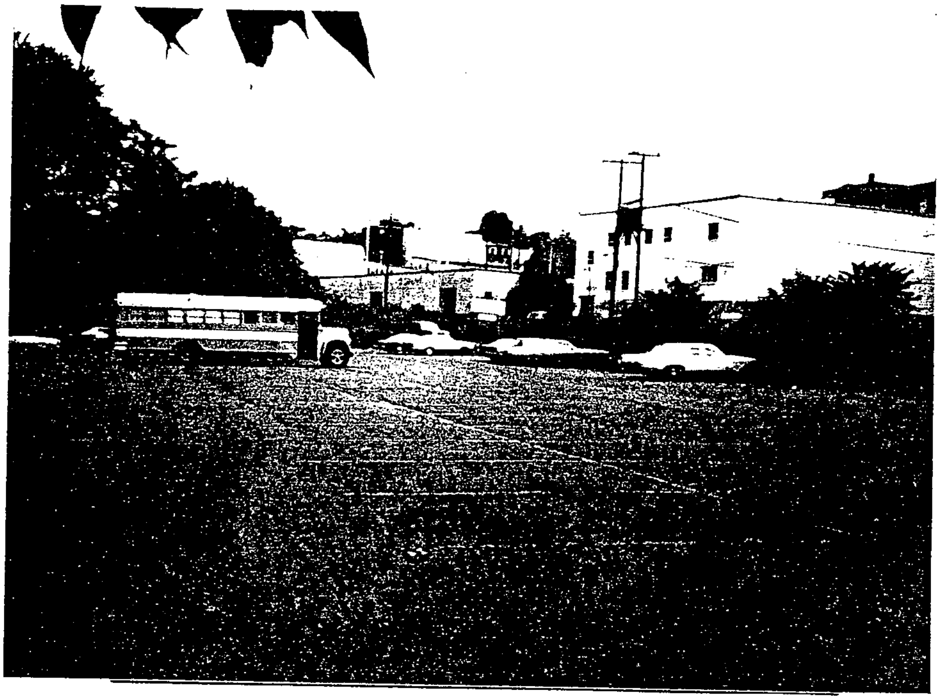
PHOTOGRAPH INDEX

Photo Number	Description	Time
1P-13	Looking south from Water Street at the Newberry sign and the parking lot. Photographer: Denice Taylor.	1050
1P-14	Looking west at the Newberry sign from Water Street. Photographer: Denice Taylor.	1052
1P-15	The north end of the parking lot. Photographer: Denice Taylor.	1055
1P-16	Looking west at the entrance gate to the Catskill Creek located in the back of the parking lot with a fisherman in the background. Photographer: Denice Taylor.	1100

1P-13 June 27, 1986 1050
Looking south from Water Street at the Newberry sign and the parking lot.
Photographer: Denice Taylor.



1P-14 June 27, 1986 1052
Looking west at the Newberry sign from Water Street.
Photographer: Denice Taylor.



1P-15 June 27, 1986 1055
The north end of the parking lot.
Photographer: Denice Taylor.

1P-16 June 27, 1986 1100
Looking west at the entrance gate to the Catskill Creek with a fisherman in the background.
Photographer: Denice Taylor.

APPENDIX B

BACKGROUND INFORMATION

```
REGION: 02
                                U. S. ENVIRONMENTAL PROTECTION AGENCY                                   PAGE:    035
                              OFFICE OF EMERGENCY AND REMEDIAL RESPONSE                                 RUN DATE: 83/03/17
                                    DATA BASE UPDATED 83/03/17                                          RUN TIME: 18:18:08
                                   T.1 - ERRIS TURNAROUND DOCUMENT
SITE DATA
*********                          EPA ID NO.:  NYD980531826  SHEET  01
        (ACTION : *_* - FOR DATA ENTRY USE ONLY)

  SF ID: *__* *_* *_*       SITE NAME:  CENTRAL HUDSON G & E /CATSKILL GAS PLANT    SOURCE:  N      SOURCE COUNTS (NOT UPDATABLE)

       *__* *_*             STREET:     WATER ST                           CONG. DIST.:  29          NOTIS:        1

  NATL PRIORITY:  N         CITY:       CATSKILL               ST:  NY   ZIP:  12414-____            STS:          0

  HRS: *_____*              CNTY NAME:  GREENE                 CNTY CODE:  039                       HWDMS:        0

  HRS DATE (YY/MM): *__/__*  LATITUDE: *__/__/____*   LONGITUDE: *___/__/____*                       COMPOSITE:    0

  RESPONSE TERMINATION (CHECK ONE IF APPLICABLE):  PENDING *_*   NO FURTHER ACTION *_*               OTHER:        0

  ENFORCEMENT DISPOSITION (CHECK ANY THAT APPLY):  NO VIABLE RESPONSIBLE PARTY *_*   VOLUNTARY RESPONSE *_*

                                                   ENFORCED RESPONSE *_*             COST RECOVERY *_*


EVENTS
******
         (ACTION - FOR                                        DATE (YY/MM)  DATE (YY/MM)   - - - - -CONDUCTED BY - - - -
     DATE ENTRY USE ONLY)   EVENT TYPE                          STARTED      COMPLETED    EPA  STATE  RESP/PARTY  OTHER    COUNTS
     ------------------     ---------------------------       -----------  -----------   --------------------------------   ------

              *_*      (X) SITE DISCOVERY (SD)                                 81/0A
   EVENTS
              *_*          PRELIMINARY ASSESSMENT (PA)                       *__/__*

              *_*          SITE INVESTIGATION (SI)             *__/__*       *__/__*    *_*   *_*

              *_*          REMEDIAL ACTION (RD)                *__/__*       *__/__*    *_*   *_*      *_*        *_*     *__*

              *_*          REMOVAL ACTION (RV)                 *__/__*       *__/__*                                      *__*

   ENFORCE    *_*          ENFORCEMENT INVESTIGATION (EI)      *__/__*       *__/__*    *_*   *_*                 *_*
   EVENTS
              *_*          ADMINISTRATIVE ORDER (AO)           *__/__*       *__/__*    *_*   *_*                 *_*

              *_*          JUDICIAL ACTION (JA)                *__/__*       *__/__*    *_*   *_*                 *_*
```

0002-B

02-8606-12/NYS

Notification of Hazardous Waste Site

United States
Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810609

NYS 000 001 236

Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name Central Hudson Gas & Electric Corp.
Street 284 South Avenue
City Poughkeepsie State N.Y. Zip Code 12602

Site Location:

Enter the common name (if known) and actual location of the site.

NYD 980531826

CENTRAL HUDSON GAS + ELECTRIC CORP.-
Name of Site Catskill Gas Plant
Street Water Street
City Catskill County Greene State N.Y. Zip Code 12414

Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title) Walker, Henry L., Vice President Production
Phone (914) 452-2000

Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year) To (Year) 1930

Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☒ Other (Specify)

Residuals from utility gas manufacture

300

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☒ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

ste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☐ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☒ Other (Specify) (spillage from normal operations)

600

Total Facility Waste Amount

cubic feet ~~unknown~~

gallons

Total Facility Area

square feet

acres

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☒ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name

Street

City State Zip Code

Signature Henry L Walker Date 06/09/81

Henry L Walker

☐ Owner, Present
☒ Owner, Past
☐ Transporter
☐ Operator, Present
☐ Operator, Past
☐ Other

NUS CORPORATION **TELECON NOTE**

CONTROL NO:

DATE: 6-24-86

TIME: 0910

DISTRIBUTION:

BETWEEN: Gary Johnston

OF: NYDEC

PHONE: (518) 382-0680

AND: Stphn Maybury (NUS)

DISCUSSION:

There are no files for Green County LF, Central Hudson G+E Catskill or CFG Yacht Company.

CFG was looked at and then taken off the list.

ACTION ITEMS:

NUS CORPORATION TELECON NOTE

CONTROL NO: 02-8606-12
02-8606-14

DATE: 6-27-86

TIME: 1020

DISTRIBUTION:

BETWEEN: Colleen Darling

OF: Village of Catskill Clerks office

PHONE: ( )

AND: Stephen C Magly (NUS)

DISCUSSION:

Central Hudson G+E Catskill Plant –
The plant was located on Water Street
where the Newberry Parking Lot is.

CFG Yacht Company –
The company ~~is in~~ was located near the
the point area of Main Street in
Catskill. It can be accessed from
the dirt road on the Right
side after the Marina Restaurant,
or from the same Road the Restaurant
is on. There are no building left. ~~on~~
The area is open right next to
the creek.

ACTION ITEMS:

NUS 037 REVISED [illegible]

02-3606-12/NYVS

NUS CORPORATION **TELECON NOTE**

CONTROL NO: 02-8606-12

DATE: 7-1-86

TIME: 10:00

DISTRIBUTION:

BETWEEN: Joe Spytko

OF: NY State Dept of Health (Oneida)

PHONE: (607) 432-3911

AND: Denice Taylor (NUS)

DISCUSSION:

SUBJECT: Background for Central Hudson Gas + Electric Plant, Water St., Catskill, NY.

JS: We don't have any information in our files on that site - We have one of these sites here in town.

If any study is done on that site we'd be very interested in receiving the results.

ACTION ITEMS:

address: NY State Dept of Health
Oneida Regional Office
PO Box 51C, RD. #4
Oneida, NY 13820

NUS 067 REVISED 0581

NUS CORPORATION **TELECON NOTE**

CONTROL NO: 02-86012

DATE: 7-29-86

TIME: 1440

DISTRIBUTION:

BETWEEN: Colleen Purling

OF: Town of Catskill

PHONE: (518) 943-3830

AND: (NUS)

DISCUSSION:

Newberry parking lot:

The Newberry parking lot taxes are paid by Newberrys.

ACTION ITEMS:

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-86012	7-29-86	1440

DISTRIBUTION:

BETWEEN:	OF:	PHONE:
Colleen Darling	Town of Catskill	(518) 943-3830

AND: Steve Muff (NUS)

DISCUSSION:

Newberry parking lot:

The Newberry parking lot taxes are paid by Newberry's.

ACTION ITEMS:

NUS 067 REVISED 0581

PHOTO LOG - CATSKILL GAS PLANT SITE

Photo	Description
1-1	Southeast facing aerial view of former Catskill Gas Plant site (parking lot along left bank of Catskill Creek - center of photo) and surrounding community of Catskill, New York. Regional slope of the area is westerly (left to right - toward the site). Surrounding land use is predominantly commercial and mixed residential. A school is located immediately west of site along opposite bank of Catskill Creek.
1-2	Aerial view of site facing east. Old (original) Catskill Gas Plant structures and former foundry are visible immediately south (right) of parking lot.
1-3	Same as Photo 1-2; closer image.
1-4	Aerial view of site facing west.
1-5	Panoramic view from the northwest corner of site facing east to southeast. This portion of site area is a paved parking lot for J.J. Newberry Department Store (upper left corner) patrons. Old foundry building is visible in far right-center of photo.
1-6	South facing view of the old foundry building and old Catskill Gas Plant structures located along Water Street.
1-7	View of waterfront facing north. Visible evidence of surface water contamination was not apparent during the site visit.
1-8 and 1-9	View behind former foundry and Catskill Gas Plant buildings showing dense vegetation and derelict machinery and equipment belonging to current owner.
1-10	View of inside of former Catskill Gas Plant structure. A furnace is visible (right center of photo).

2. Purpose

2. PURPOSE

In December of 1985, the site of the former Catskill Gas Plant was listed on the EPA Registry of Inactive Hazardous Waste Sites because coal gas manufacturing operations, in general, have been found to have generated waste byproducts which contain hazardous chemical compounds, and little is known about the disposition of the wastes generated by this facility.

The goal of the Phase I investigation of the Catskill Gas Plant site was to: (1) obtain available records on the site history from CHG&E, state, federal, county, and local agencies; (2) obtain information on site topography, geology, local surface water and ground-water use, previous contamination assessments, and local demographics; (3) interview site owners, operators, and other groups or individuals knowledgeable of site operations; (4) conduct a site inspection to observe current conditions; and (5) prepare a Phase I report. The Phase I report includes an assessment of the available information, and a recommended work plan for Phase II studies.

3. Scope of Work

3. SCOPE OF WORK

The Phase I investigation of Catskill Gas Plant site involved a site inspection by EA Science and Technology, as well as record searches and interviews. The following agencies or individuals were contacted:

Contact	Information Received
Mr. Jeff Clock Environmental Affairs Personnel Central Hudson Gas & Electric Corporation 284 South Avenue Poughkeepsie, New York 12601 (914) 452-2000	Site history/interview
Mr. Frank Fede Central Hudson Gas & Electric Corporation 284 South Avenue Poughkeepsie, New York 12601 (914) 452-2000	Site information
Mr. Wilbur Peters Central Hudson Gas & Electric Corporation 284 South Avenue Poughkeepsie, New York 12601 (914) 452-2000	Site history
Ms. Kristen E. Kennedy Central Hudson Gas & Electric Corporation 284 South Avenue Poughkeepsie, New York 12601 (914) 452-2000	Historical documents
Mr. Jack Corcoran Regional Customer Relation Manager Catskill District Central Hudson Gas & Electric Corporation 391 Main Street Catskill, New York 12414 (518) 943-3000	Site history/interview

Contact	Information Received
Mr. Joseph Warnock Central Hudson Gas & Electric Corporation 391 Main Street Catskill, New York 12414 (518) 943-3000	No information
Mr. John Shultz Central Hudson Gas & Electric Corporation 391 Main Street Catskill, New York 12414 (518) 943-3000	No information
Mr. Lester Roe Retired Central Hudson Gas & Electric Corporation Employee Catskill District 106 Jefferson Height Catskill, New York 12414 (518) 943-3563	Site history/operations
Mr. Erman Ourich Retired Central Hudson Gas & Electric Corporation Employee Catskill District 2 Koeppel Avenue Catskill, New York 12414 (518) 943-3836	Site history/operations
Mr. Evert Pelhem Retired Central Hudson Gas & Electric Corporation Employee Catskill District 32 Koeppel Avenue Catskill, New York 12414 (518) 943-4173	Site history/operations
Mr. Shaminder P. Singh/ Mr. Ramanada Pergadia, P.E. New York State Department of Environmental Conservation 21 South Putt Corners Road New Paltz, New York 12561 (914) 255-5453	Site file

Contact	Information Received
Mr. Walter Demick, P.E. New York State Department of Environmental Conservation Bureau of Site Control 50 Wolf Road Albany, New York 12233-0001 (518) 457-0639	Site file
Mr. Mark Moroukian New York State Department of Environmetnal Conservation Bureau of Remedial Action 50 Wolf Road Albany, New York 12233-0001 (518) 457-4346	No file/information
Mr. Peter Skinner, P.E. New York State Attorney General's Office Room 221 Justice Building Albany, New York 12224 (518) 474-2432	No file/information
Mr. Louis A. Evans, Atty. New York State Department of Environmental Conservation 202 Mamaroneck Avenue White Plains, New York 10601-5381 (914) 761-6600	No file/information
Mr. Roberto Olazagasti/ Mr. Dennis Farrar Bureau of Hazardous Site Control New York State Department of Environmental Conservation 50 Wolf Road Albany, New York 12233-0001 (518) 457-0747	No file/information
Mr. Jerry Meehan Bureau of Toxic Substance Assessment New York State Department of Health Empire State Plaza Corning Tower Building Albany, New York 12237 (518) 473-8427	No file/information

Contact	Information Received
Mr. James Covey, P.E. New York State Department of Health Nelson A. Rockefeller Empire State Plaza Corning Tower Building Albany, New York 12237 (518) 473-4637	Community Water Supply Atlas
Mrs. Carole Petersen NPL Coordinator, Site Compliance Branch U.S. Environmental Protection Agency Room 757 26 Federal Plaza New York, New York 10278 (212) 264-4595	Potential Hazardous Waste Site Preliminary Assessment
Mr. Bryan L. Swift/Mr. Larry Brown Significant Habitat Unit New York State Department of Environmental Conservation Wildlife Resources Center Delmar, New York 12054-9767	Significant habitat
Mr. Peter Housiak Mapping Information Unit New York State Department of Public Transportation State Campus Building 4 - Room 105 Albany, New York 12232	Aerial photos
Mr. Lloyd A . Wagner U.S. Department of the Interior Geological Survey Water Resources Division P.O. Box 1669 Albany, New York 12201	100-year floodplain maps, Topographic maps
Ms. Rebecca Harrison Program Manager Office of Parks, Recreation and Historical Preservation Empire State Plaza Agency Building One, 13th Floor Albany, New York 12238	Historical and archaeological information
Mr. Pat Walsh Chairman Planning/Zoning Commission Village of Catskill 349 Main Street Catskill, New York 12414 (518) 943-2650	Zoning information

Contact	Information Received
Mr. John Amerault Sewage Treatment Plant Operator Catskill Sewage Treatment Plant Lower Main Street Catskill, New York 12414 (518) 943-2585	Public sewer information
Mr. Tom Hart Coast Resources Specialist Department of State Coastal Management Programs 4th Floor 162 Washington Avenue Albany, New York 12233-0001 (518) 474-3642	No file/information
Mr. Norman McBride Fisheries Biologist New York State Department of Environmental Conservation Route 10 Stamford, New York 12167 (607) 474-3642	Environmental information
Mr. John Iannotti Supervisor Technical Support Section New York State Department of Environmental Conservation Bureau of Remedial Action 50 Wolf Road Albany, New York 12233-0001 (518) 457-5637	No file/information
Mr. Richard Clearwater Water Treatment Plant Manager Catskill Water Treatment Plant R.D. Box 20 Earlton, New York 12058 (518) 945-1839	Water supply information
Mr. Bill Tice Assistant Superintendent Catskill Department of Public Works 422 Main Street Catskill, New York 12414 (518) 943-5595	Public sewers information

Contact	Information Received
Mr. Doug Carlson Biologist New York State Department of Environmental Conservation Route 10 Stamford, New York 12167	Biologic information for Catskill Creek
Mrs. Mabel Smith Green County Historian 251 Main Street Catskill, New York 12414 (518) 943-5965	Site history
Mr. Vincent Ludo Greene County Agricultural Extension Account H.C.R. No. 3 Box 906 Ciaro, New York 12413 (518) 622-9820	Agricultural information
Mrs. Martin Skelly Water Relief Operator Catskill Water Treatment Plant R.D. Box 20 Earlton, New York (518) 945-1839	Population served by CWTP
Mr. Ron Roth Director Greene County Planning Commission Rt. 3, Box 906 Ciaro, New York (518) 622-3251	Census data

4. SITE ASSESSMENT - CATSKILL GAS PLANT

4.1 SITE HISTORY

The site of the former Catskill Gas Plant is located along Water Street in the Village of Catskill, Greene County, New York. The site encompasses an area of approximately 3.7 acres. Area C, depicted in Figure 1-2, is currently owned by the First National Bank of Boston and is currently a paved parking lot to J.J. Newberry's Department Store (Appendix 1.1-1). Area A, depicted in Figure 1-2, is currently owned by Ms. Barbara MacDonald of Catskill (Appendix 1.1-1). Area B, depicted in Figure 1-2, is currently owned by Carl and Eva Yannone of Catskill and is the former location of a gas holding tank (Figure 1-2 and Appendix 1.1-2).

The Catskill Gas Works began operation in 1858 (Appendix 1.1-3). By 1890, under the ownership and operation of Catskill Illuminating and Power Company, the coal gas plant was producing 3 million cu ft/year (Appendix 1.1-4). The initial plant was very small and by 1900, owing to increased consumer demand, new equipment was installed to increase the facility's capacity. At the turn of the century, the Catskill Gas Works was producing 6 million cu ft/year (Appendix 1.1-4). In 1905, the Catskill Illuminating and Power Company was purchased by Upper Hudson Electric and Railroad Company (Appendix 1.1-5).

By 1920, production rates reached 11 million cu ft/year, but it was not enough to meet the increasing demands of the Catskill district. In 1923, the Upper Hudson Electric and Railroad Company moved the gas plant to the site of the electric light and power station (from Area A and B to C in Figure 1-2) nearly adjacent to its original facility. In doing so, the capacity of the gas works was doubled (Appendix 1.1-4). There is only occasional mention of dumping, spilling, or disposing of wastes in the historical records of the Catskill Gas Plant. A letter dated 18 July 1899 mentions a dumping ground for ashes at the original gas plant site (Appendix 1.1-6). There is also mention of a tar well that was installed at the new facility in 1923 (Appendix 1.1-7).

In 1925, the Upper Hudson Electric and Railroad Company proposed to demolish the old gas plant, and establish an office and storeroom area in part of the facility while removing the coal shed and processing apparatus. These changes, however, could not be confirmed (Appendix 1.1-8). In June 1925, the old Catskill gas works were sold to the adjoining Catskill Foundry and Machine Company (Appendixes 1.1-9 through 1.1-13). In 1926, the Upper Hudson Electric and Railroad Company merged with several other small utility companies to form Central Hudson Gas & Electric Corporation (CHG&E) (Appendix 1.1-5). By 1930, the new gas works under CHG&E was producing 24 million cu ft/year (Appendix 1.1-4).

In 1931, a decision was made to install a butane-air gas plant at the Catskill site (Appendix 1.1-14). Butane-air gas plants were more efficient and cleaner. As a result, the coal gas plant was phased out.

As part of the effort to determine the history of the Catskill Gas Plant, EA obtained information from CHG&E's files; interviewed personnel potentially familiar with the plant and its operation; and contacted federal, state, county, and local government agencies and officials (Chapter 3). A detailed account of actual waste or byproduct production and management practices for the Catskill Gas Plant does not exist and could not be developed based upon available information. However, coal gas manufacturing processes, in general, and the waste byproducts that were typically generated (coal tar, spent oxide and lime, gas and ammonia liquors, coke, etc.) have been documented (Appendix 1.1-15). A review of the technical literature indicates that coal gas manufacturing byproducts and wastes contain chemical compounds (polynuclear aromatic hydrocarbons, phenolics, light aromatics [benzene, toluene, ethylbenzene, xylenes], trace metals, etc.) which have the potential to pose a risk to human health or the environment (Appendix 1.1-15).

The operator of the local sewer treatment plant reported that tars have gotten into the Catskill public sewers and caused problems at the sewer treatment plant. However, he could not say where the tar had come from and did not have any analytical data to determine the nature of the tar (Appendix 1.1-17).

On 27 June 1986, the U.S. EPA completed a "Potential Hazardous Waste Site Preliminary Assessment" of the former Catskill Gas Plant site (Appendix 1.1-16). There was no indication of significant waste disposal activities, and no further actions were recommended by the EPA as a result of the preliminary assessment of the site.

On 3 September 1986, EA performed an inspection of the former Catskill Gas Plant site and observed no evidence of the presence of hazardous chemical compounds, although no samples were taken from the site environs. Furthermore, EA has researched all pertinent agency files and interviewed persons who were affiliated with or potentially knowledgeable of the site, and found no documented hazardous waste or contamination at the site.

4.2 SITE TOPOGRAPHY

The Catskill Gas Plant site is situated along the east bank of Catskill Creek in the Village of Catskill, Greene County, New York, at an elevation of approximately 25 ft above MSL. The regional slope of terrain occurs at a gradient of approximately 15 percent to the southwest (toward Catskill Creek). The site itself is relatively flat. A 2 percent rise in slope occurs eastward across Water Street toward the Village of Catskill.

The site is comprised of three separate areas upon which two gas manufacturing facilities operated during two different periods in time. The northern-most area (Area C in Figure 1-2) is currently owned by the First National Bank of Boston and is currently a paved parking lot to J.J. Newberry Department Store. A second area (Area A), adjacent to an old foundry building, is owned by Ms. Barbara MacDonald of Catskill. The third area (Area B), the former location of a gas holding tank, is currently owned by Carl and Eva Yannoe of Catskill. The three parcels encompass a combined total area of approximately 3.7 acres.

The north border of the former Catskill Gas Plant site is a chain-link fence adjacent to a law office building, and the south border of the site is an old mill works building. Water Street borders the site to the east, and Catskill Creek borders the site to the west.

The nearest commercial establishment (a bookstore) is located directly on the site. The nearest residence is located onsite in the old foundry building. The nearest surface waterbody, Catskill Creek, forms the western border of the site. The nearest ground-water well is a privately-owned well located approximately 3,000 ft to the northwest of the site in the Town of Catskill (Appendix 1.2-1).

4.3 SITE HYDROGEOLOGY

Regionally, the unconsolidated sediment contiguous with the site is reported by Berdan (1954) to be stratified drift of a large delta that is present east of Jefferson Heights (located approximately 6,000 ft northwest of the site) along the Catskill Creek (Appendix 1.3-1). Additionally, Berdan states "that the delta has been divided into two parts by Catskill Creek, and the northern portion extends several miles up the valley of Hans Vosen Kill" (located approximately 2,000 ft upstream from the site). The deltaic deposit is reportedly composed mostly of sand and gravel that was deposited on older lacustrine clays (Appendix 1.3-1). However, in the immediate vicinity of the site, the upper 5 ft of unconsolidated sediment is reported by the Soil Conservation Service to be the Hudson silt loam, a "clayey soil formed in lake-laid deposits" (Appendix 1.3-2). The potential presence of sand and gravel at greater depths, the stratigraphic relationship of the Hudson silt-loam to the previously described coarse-grained deltaic deposits, and the total thickness of the unconsolidated sediment at the site are unknown.

The unconsolidated sediment in the vicinity of the site is underlain by sandstone and shale designated by Berden (1954) as the Ordovician Age Normanskill shale (Appendix 1.3-1), and more recently designated by Fisher et al. (1970) as the Ordovician Age Austin Glen Formation (Appendix 1.3-3).

There are no wells in the vicinity of the site which have been completed in the unconsolidated sediment. However, within 3 mi of the site, the sandstone and shale bedrock has reportedly been developed by several wells for domestic and farm use (Plate 1 and Table 6 of Appendix 1.3-1), and for non-municipal community water supply (Appendix 1.3-4). Because of the potential for sand and gravel layers/lenses within the unconsolidated sediment, there is a potential for hydraulic communication with the bedrock. Therefore, both the unconsolidated sediment and the sandstone and shale bedrock are designated as the aquifer of concern. The aquifer of concern is bounded to the east by the Hudson River, and to the west of the site by a change in rock type to Silurian/ Devonian Age carbonate rock (approximate extent shown on Plate 2 of Appendix 1.3-1).

The ground-water table at the site is anticipated to be at approximately the same elevation as the surface of Catskill Creek which was observed during EA site reconnaissance to be about 5 ft below the top of the river bank (ground surface) at high tide.

4.4 SITE CONTAMINATION

Waste Types and Quantities

A detailed account of actual waste or byproduct production and management practices for the Catskill Gas Plant does not exist. Furthermore, EA has researched all pertinent agency files, interviewed personnel potentially familiar with the facility, and conducted a site inspection, and has found no documented hazardous waste or contamination at this site.

Ground Water

No data available.

Surface Water

No data available.

Soil

No data available.

Air

During the EA site inspection, a photoionization detector was used to measure for volatile organics in the air. No readings above background levels were obtained in the breathing zone.

5. Preliminary HRS

5.1 Narrative Summary

CATSKILL GAS PLANT
VILLAGE OF CATSKILL, GREENE COUNTY

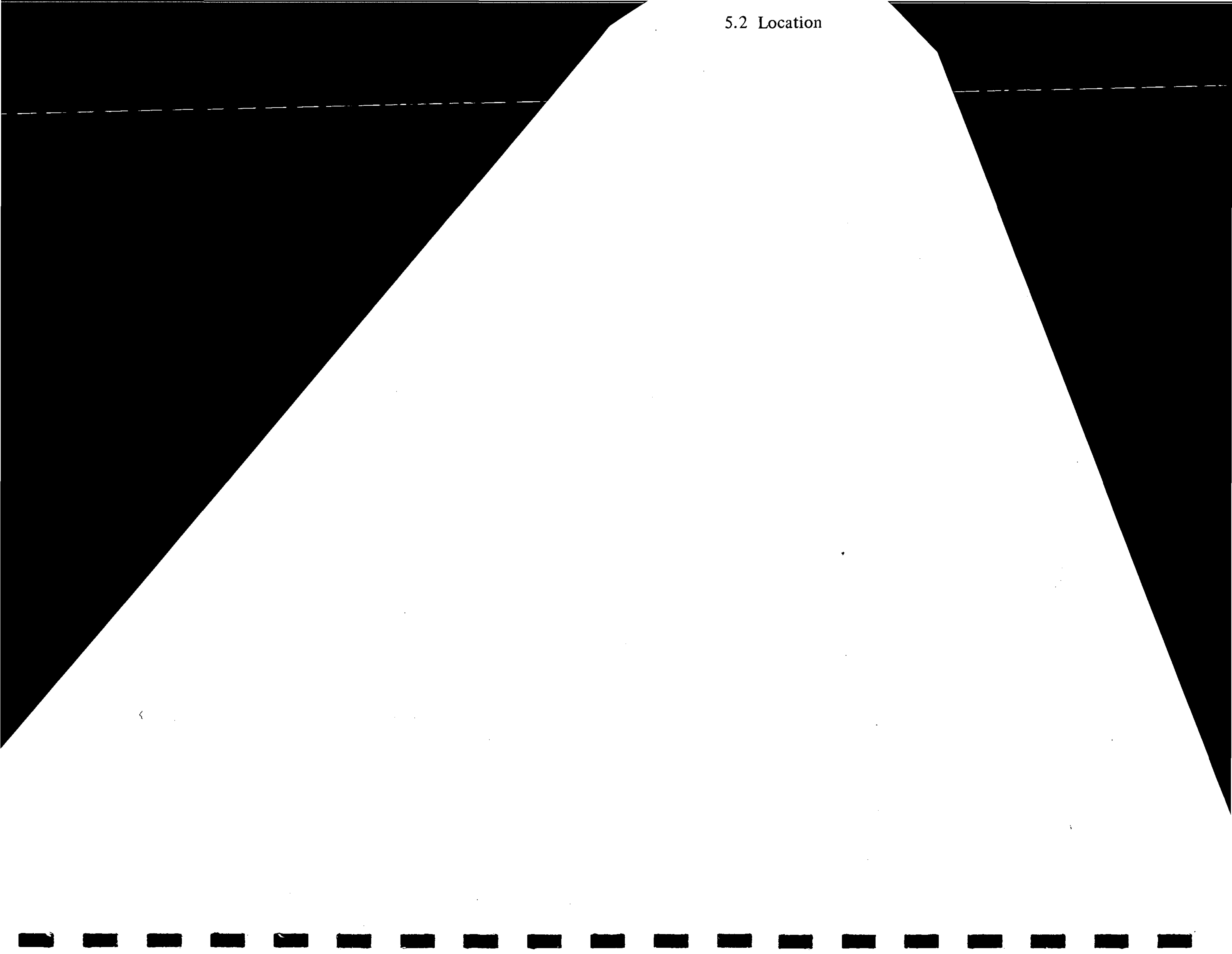
The Catskill Gas Plant site is located along Water Street in the Village of Catskill, Greene County, New York. The site is comprised of three separate areas upon which two gas manufacturing facilities operated during two different periods in time. One area is currently owned by the First National Bank of Boston and is currently a paved parking lot to J.J. Newberry Department Store. A second parcel adjacent to an old foundry building is owned by Ms. Barbara MacDonald of Catskill. The third parcel, the former location of a gas holding tank, is currently owned by Carl and Eva Yannoe of Catskill. All three parcels encompass a total area of approximately 3.7 acres.

The first (oldest) plant which operated in this area utilized a carbonization process to manufacture gas until the early 1900s. This plant was constructed and operated by the Catskill Illuminating and Power Company. Around 1905, this plant was sold to the Upper Hudson Electric and Railroad Company who operated the plant until 1923. In the early 1920s, Upper Hudson Electric and Railroad Company constructed a new coal gas plant north of the old plant and changed processes to water gas production. In 1925, Upper Hudson Electric and Railroad Company sold the old gas plant property to the Catskill Foundry and Machine Works. During the same year, Central Hudson Gas & Electric Company purchased the newly constructed gas plant. In 1926, Central Hudson Gas & Electric Company consolidated with several other gas manufacturing companies to form Central Hudson Gas & Electric Corporation (CHG&E). CHG&E changed the coal gas plant to a butane/gas/air plant in 1931. The coal gas manufacturing operations were subsequently disassembled, and the property and equipment sold.

A recent EPA review of the site (June 1986) indicated that there is no documented evidence of any significant waste disposal. On 3 September 1986, EA performed an inspection of the former Catskill Gas Plant, and no evidence of coal gas manufacturing wastes or hazardous chemical compounds was observed, although no samples were taken from the site environs at that time. During the site inspection, a photoionization detector was used to measure for volatile organics in the air. No readings above background were obtained in the breathing zone.

EA has researched all pertinent agency files, interviewed CHG&E personnel who were potentially knowledgeable about this site, conducted a site inspection, and has found no documented hazardous waste or contamination at this site. Therefore, because the EPA Hazardous Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there is no documented hazardous waste or contamination in this case, it is not appropriate to provide a Hazard Ranking Score (or documentation) for this site.

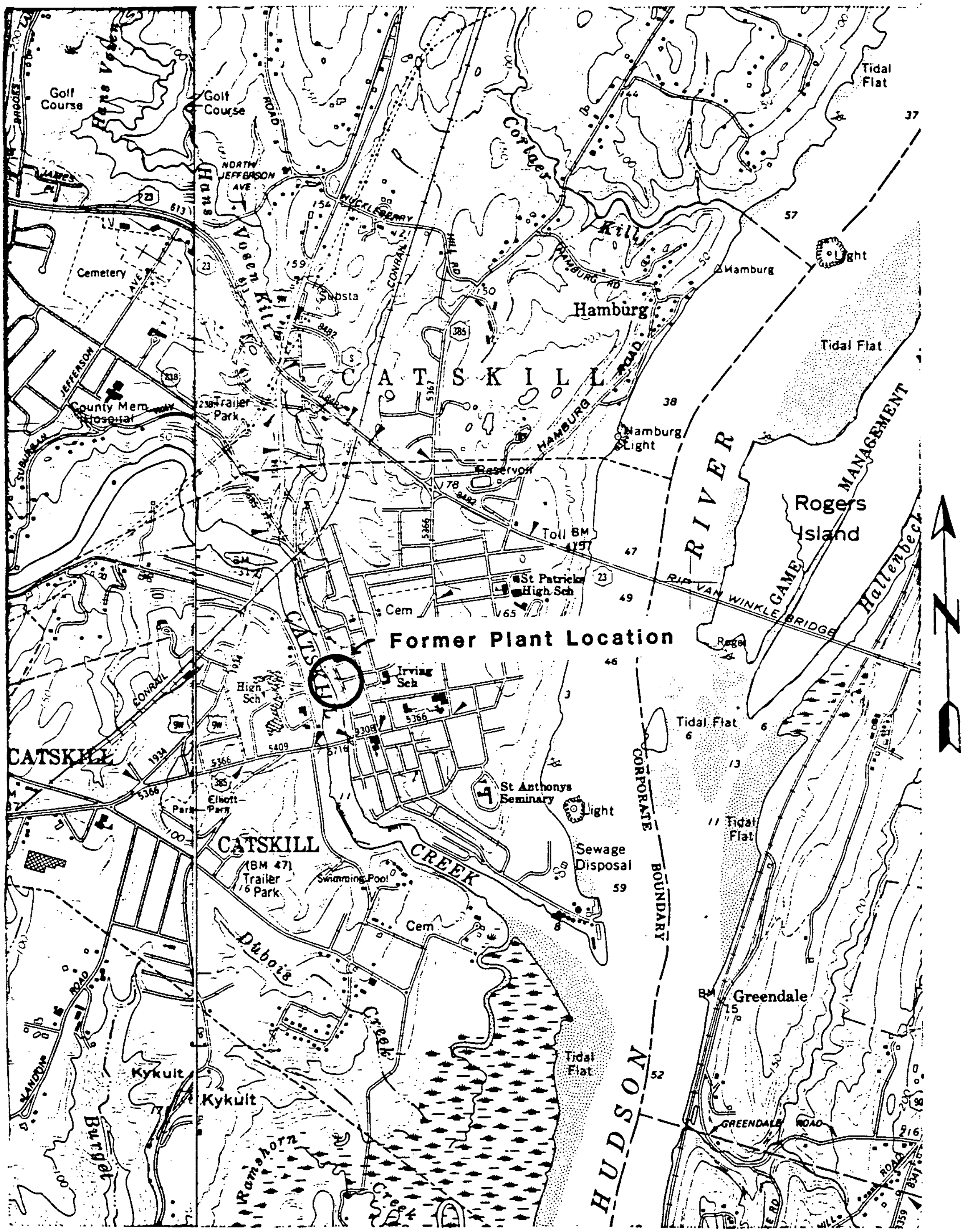
5.2 Location



Site Coordinates:

Latitude: 42° 13' 10"
Longitude: 73° 51' 57"

CATSKILL COAL GAS PLANT



Hudson South Quad
NYSDOT 7.5-Minute Series
Dated 1976

Scale 1:24,000

Facility name: Catskill Gas Plant

Location: Village of Catskill, Greene County

EPA Region: II

Person(s) in charge of the facility:

Mr. Carl and Eva
Yannoe
342 Main Street
Catskill, NY 12414

First National Bank
of Boston
c/o J.J. Newberry
Tax Department
888 7th Avenue
New York, New York 10019

Ms. Barbara MacDonald
125 Main Street
Catskill, New York 12414

Name of Reviewer: Date:

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The site area where the coal gasification plants were located is approximately 3.7 acres. The plants have been completely disassembled. The old remnants left of the plants are an entrance gate which is part of a cyclone fence which encompasses most of the J.J. Newberry parking lot and some old brick structure of the original coal gasification plant which are now part of the old foundry building.

EA has researched all pertinent agency files, interviewed persons potentially familiar with the site, conducted a site inspection, and has found no documented hazardous waste or contamination at this site. Therefore, because the EPA Hazard Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there is no documented hazardous waste or contami-*

Scores: S_M = (S_{gw} = S_{sw} = S_a =)

S_{FE} =

S_{DC} =

FIGURE 1
HRS COVER SHEET

*nation in this case, it is not appropriate to provide a Harard Ranking Score (or documentation) for this site.

5.4 HRS Documentation

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: As briefly as possible, summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

FACILITY NAME: Catskill Gas Plant

LOCATION: Village of Catskill, Greene County

DATE SCORED: 2 December 1986

PERSON SCORING: EA Science and Technology

PRIMARY SOURCES(S) OF INFORMATION (e.g., EPA region, state, FIT, etc.)

Central Hudson Gas & Electric Corporation files
EA Site Inspection.

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

COMMENTS OR QUALIFICATIONS:

EA has researched all pertinent agency files, interviewed CHG&E active and retired personnel, conducted a site inspection, and has found no documented hazardous waste or contamination at this site. Therefore, because the EPA Hazard Ranking System is designed to evaluate migration pathways of identified hazardous substances from a site, and because there is no documented hazardous waste or contamination in this case, it is not appropriate to provide a Hazard Ranking Score (or documentation) for this site.

5.5 EPA 2070-12

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

EPA Form 2070-12
July, 1981

Catskill Gas Plant

EPA

Potential Hazardous Waste Site

Preliminary Assessment

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: NY
02 SITE NUMBER: NYD-98053182

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): CATSKILL Gas Plant
02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: WATER STREET (ACROSS FROM J.J. NEWBERRY DEPT. STORE
03 CITY: CATSKILL
04 STATE: NY
05 ZIP CODE: 12414
06 COUNTY: GREENE
07 COUNTY CODE: 39
08 CONG DIST: 29
09 COORDINATES LATITUDE: 42°13'13".N LONGITUDE: 73°52'03".W
10 DIRECTIONS TO SITE (Starting from nearest public road): TAKE ROUTE 23 TO SPRING STREET (ROUTE 385) TOWARD THE VILLAGE OF CATSKILL. TURN RIGHT ONTO BRIDGE STREET, FOLLOW BRIDGE STREET, TURN RIGHT ON WATER STREET AT THE INTERSECTION, FOLLOW WATER STREET, THE J.J. NEWBERRY PARKING LOT IS ON THE LEFT SIDE

III. RESPONSIBLE PARTIES (THREE OWNERS)

01 OWNER (If known):
1 FIRST NATIONAL BANK OF BOSTON
2 MS BARBARA MCDONALD
3 ~~[illegible]~~ CARL AND ~~[illegible]~~ [illegible] YANNONE

02 STREET (Business, mailing, residential):
(1) c/o J.J. NEWBERRY TAX DEPT 338 7TH AVENUE
2 125 WATER STREET
3 342 WATER STREET

03 CITY:
1 NEW YORK CITY
2 CATSKILL
3 CATSKILL

04 STATE: N.Y.
05 ZIP CODE: 10019 12414 12414
06 TELEPHONE NUMBER: ( )

07 OPERATOR (If known and different from owner):
08 STREET (Business, mailing, residential):
09 CITY:
10 STATE:
11 ZIP CODE:
12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: MONTH DAY YEAR ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: MONTH DAY YEAR ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 2 4 3 86 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: (Specify)
CONTRACTOR NAME(S): , 2. E.A. SCIENCE AND TECHNOLOGY

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1858 (BEGINNING YEAR) | 1930's (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED: COAL GASIFICATION PLANTS PRODUCED WASTES SUCH AS COAL TAR, LIME SLUDGES, AND CYANIDE-COATED WOOD CHIPS.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

UNKOWN.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: MR JEFF CLOCK
02 OF (Agency/Organization): CENTRAL HUDSON GAS AND ELECTRIC, CORP.
03 TELEPHONE NUMBER: (914) 452-2000
04 PERSON RESPONSIBLE FOR ASSESSMENT: MR V. VINCENT LUCI
05 AGENCY:
06 ORGANIZATION: E.A.
07 TELEPHONE NUMBER: (914) 692-6706
08 DATE: 12/8/86 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE NY
02 SITE NUMBER NYD 98053/320

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply) UnKnown

☐ A SOLID
☐ B POWDER, FINES
☐ C SLUDGE
☐ D OTHER
☐ E SLURRY
☐ F. LIQUID
☐ G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS UNKNOWN
CUBIC YARDS
NO OF DRUMS

03 WASTE CHARACTERISTICS (Check all that apply)

☐ A TOXIC
☐ B. CORROSIVE
☐ C. RADIOACTIVE
☐ D. PERSISTENT
☐ E SOLUBLE
☐ F INFECTIOUS
☐ G FLAMMABLE
☐ H IGNITABLE
☐ I HIGHLY VOLATILE
☐ J EXPLOSIVE
☐ K REACTIVE
☐ L INCOMPATIBLE
☐ M NOT APPLICABLE

UNKNOWN

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	UNKNOWN	UNKNOWN	
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	UNKNOWN				

V. FEEDSTOCKS (See Appendix for CAS Numbers) N/A

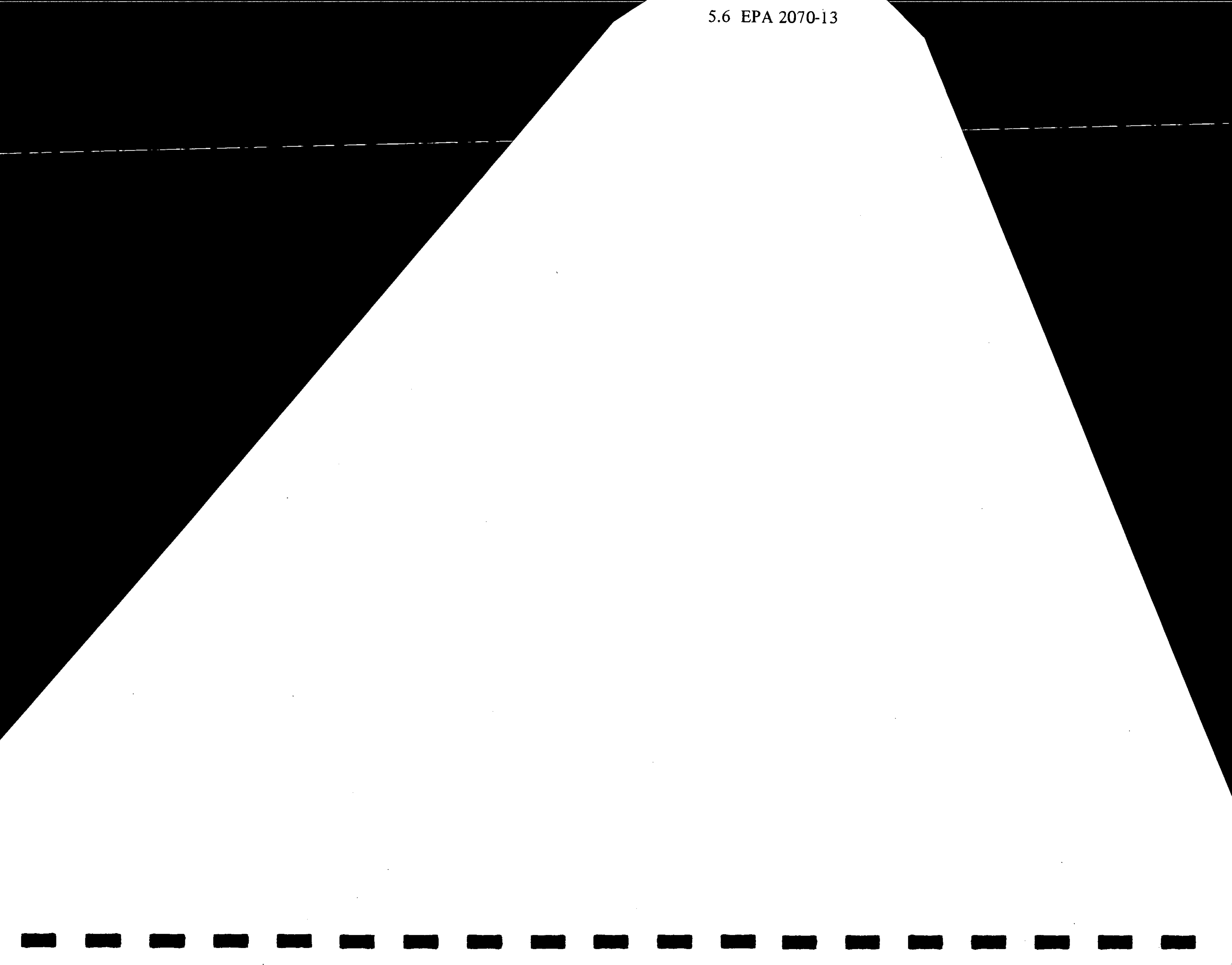
CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.A. SITE INSPECTION. 3 SEPTEMBER 86
MR JACK CORORAN, PERSONAL COMMUNICATION, 12 SEPTEMBER 1986
MRS MABEL SMITH, PERSONAL COMMUNICATION, 9 SEPTEMBER 1986

APPENDIX 1.1-15

5.6 EPA 2070-13



United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington, DC 20460

EPA Form 2070-13
July, 1981

Catskill Gas Plant

EPA

Potential Hazardous Waste Site

Site Inspection Report

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: NYD-980531326

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Catskill Gas Plant

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: WATER STREET (ACROSS FROM J.J. NEWBERRY DEPT. STORE)

03 CITY: CATSKILL

04 STATE: NY

05 ZIP CODE: 12414

06 COUNTY: GREENE

07 COUNTY CODE: 39

08 CONG DIST: 29

09 COORDINATES: LATITUDE 42° 13′ 13″ N | LONGITUDE 73° 51′ 33″ W

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL ______ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER ______ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: (2) 5 13 86 (MONTH DAY YEAR)

02 SITE STATUS
☐ ACTIVE
☒ INACTIVE

03 YEARS OF OPERATION: 1858 | 1932 (BEGINNING YEAR / ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ______ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ______ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR ______ (Name of firm) ☒ G. OTHER E.A. SCIENCE AND TECHNOLOGY, INC. (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
MR ANDRIS LAPIN	GEOLOGIST	E.A.	(914) 692-6706

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
MR V. VINCENT LUCI	ENGINEER	E.A.	(914) 692-6706
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
MR JACK CORCORAN	REC. CUST. RELATIONS MANG.	CHG&E CATSKILL DIST 391 MAIN STREET, N.Y. 12414	(518) 943-3000
MR JEFF CLUCK	ENV. AFFAIRS PERSONNEL	CHG&E 284 SOUTH AVENUE POUGHKEEPSIE, N.Y.	(914) 452-2000
MR EVERT PELHAM	RETIRED CATSKILL	32 KOEPPEL AVENUE CATSKILL, N.Y.	(518) 943-4172
MR LESTER ROE	DISTRICT CUSTOMER	106 JEFFERSON HEIGHTS CATSKILL, N.Y. 12414	(518) 943-3563
MR ERMAN QUICK	RELATIONS PERSONNEL	9 KOEPPEL AVENUE CATSKILL, N.Y.	(518) 943-3836
	FOR CHG&E		( )

17 ACCESS GAINED BY (Check one)
☒ PERMISSION
☐ WARRANT

18 TIME OF INSPECTION: 10:30 AM

19 WEATHER CONDITIONS: CLOUDY, TEMPERATURES IN 60s

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
MR JEFF CLUCK	CENTRAL HUDSON GAS AND ELECTRIC CORP.	(914) 452-2000

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
MR V. VINCENT LUCI		E.A.	914-692-6706	12, 8, 86 (MONTH DAY YEAR)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: NYD980531286

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS NONE DOCUMENTED

01 PHYSICAL STATES (Check all that apply)

☐ A. SOLID
☐ B. POWDER, FINES
☐ C. SLUDGE
☐ D. OTHER ______ (Specify)
☐ E. SLURRY
☐ F. LIQUID
☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS ______
CUBIC YARDS ______
NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

☐ A. TOXIC
☐ B. CORROSIVE
☐ C. RADIOACTIVE
☐ D. PERSISTENT
☐ E. SOLUBLE
☐ F. INFECTIOUS
☐ G. FLAMMABLE
☐ H. IGNITABLE
☐ I. HIGHLY VOLATILE
☐ J. EXPLOSIVE
☐ K. REACTIVE
☐ L. INCOMPATIBLE
☐ M. NOT APPLICABLE

III. WASTE TYPE NONE DOCUMENTED

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers) NONE DOCUMENTED

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	COAL	999	FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.A. SITE INSPECTION, 3 SEPTEMBER 86
MR JACK CORORAN (CHC4E), PERSONAL COMMUNICATION, 12 SEPTEMBER 86
MRS MABEL SMITH (GREEN COUNTY HISTORIAN), PERSONAL COMMUNICATION, 5 SEPTEMBER 86
APPENDIX I-1-15

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: NYD950531826

II. HAZARDOUS CONDITIONS AND INCIDENTS NONE KNOWN

01 ☐ A. GROUNDWATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ________ (Acres)
04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE: NY

02 SITE NUMBER: NYD950531826

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

NONE KNOWN

01 ☐ K. DAMAGE TO FAUNA 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION (include name(s) of species)

NONE KNOWN

01 ☐ L. CONTAMINATION OF FOOD CHAIN 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

NONE KNOWN

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NONE KNOWN

01 ☐ N. DAMAGE TO OFFSITE PROPERTY 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

NONE KNOWN

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION JOHN AMIRAULT, CATSKILL SEWAGE TREATMENT PLANT OPERATOR, STATED A TAR SUBSTANCE HAS ENTERED THE SEWAGE TREATMENT PLANT BY WAY OF ITS SEWERS. PRECISE ENTRY POINT IS NOT KNOWN AT THIS TIME. PUBLIC SEWERS DRAIN IN THE NEARBY AREA OF THE SITE.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED

04 NARRATIVE DESCRIPTION

NONE KNOWN

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

NONE KNOWN

III. TOTAL POPULATION POTENTIALLY AFFECTED: ______

IV. COMMENTS

THE COAL GASIFICATION PLANTS ARE LONG GONE. RECONNAISSANCE CONDUCTED BY E.A. ON 3 SEPTEMBER 86 INDICATED NO VISIBLE SIGNS OF WASTES OR ORGANIC VAPORS ABOVE BACKGROUND LEVELS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.A. SITE RECONNAISSANCE OF 3 SEPTEMBER 86

JOHN AMIRUALT (CATSKILL SEWAGE TREATMENT PLANT OPERATOR) PERSONAL COMMUNICATIONS, 9 SEPTEMBER 1986

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: NYD 980531826

II. PERMIT INFORMATION NONE

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☑ E. TANK, BELOW GROUND	UNKNOWN	UNKNOWN
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER ______ (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER ______ (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE
OLD FOUNDRY/BUILDING

06 AREA OF SITE

APPROX 3.7 (Acres)

07 COMMENTS

THE TWO COAL GASIFICATION PLANTS ARE NO LONGER IN EXISTENCE, THE ONLY REMNANTS LEFT ARE AN ENTRANCE GATE WHICH IS PART OF THE CYCLONE FENCE WHICH ENCOMPASS J.J. NEWBERRY PARKING LOT AND SOME OLD BUILDING STRUCTURES OF THE ORIGINAL PLANT. NO DOCUMENTED EVIDENCE OF HAZARDOUS WAST OR CONTAMINATION HAVE BEEN DISCOVERED BY E.A.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

THE SITE IS ACCESSIBLE FROM WATER STREET. ENTRANCE ACCESS TO J.J. NEWBERRY PARKING LOT AND THE OLD FOUNDRY BUILDING EXIST.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

E.A. SITE RECONNAISSANCE 3 SEPTEMBER 86
CENTRAL-HUDSON GAS AND ELECTRIC, CORP HISTORY RECORDS
CHAPTER 3

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE: NY

02 SITE NUMBER: NYD 980531826

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS	ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐		A. ☐	B. ☐	C. ☒	A. 9.0 (mi)
NON-COMMUNITY	C. ☐	D. ☒		D. ☐	E. ☐	F. ☐	B. 0.6 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING

☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)

☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)

☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 2174

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.6 (mi)

04 DEPTH TO GROUNDWATER: Approx 10' (ft)

05 DIRECTION OF GROUNDWATER FLOW: S.W.

06 DEPTH TO AQUIFER OF CONCERN: UNKNOWN (ft)

07 POTENTIAL YIELD OF AQUIFER: UNKNOWN (gpd)

08 SOLE SOURCE AQUIFER: ☐ YES ☐ NO UNKNOWN

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

UNKNOWN

10 RECHARGE AREA ☐ YES ☐ NO COMMENTS UNKNOWN

11 DISCHARGE AREA ☐ YES ☐ NO COMMENTS UNKNOWN

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE

☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES

☐ C. COMMERCIAL, INDUSTRIAL

☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
CATSKILL CREEK	☐	0.01 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE A. 4.718 NO. OF PERSONS

TWO (2) MILES OF SITE B. 18.171 NO. OF PERSONS

THREE (3) MILES OF SITE C. 23,371 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 0.01 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE ______

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.01 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

THE VILLAGE OF CATSKILL IS A SMALL URBAN VILLAGE AND THE TOWN OF CATSKILL IS ADJACENT TO THE VILLAGE. THE TOTAL POPULATION FOR THESE TWO URBAN AREAS IS 12,174.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE NY
02 SITE NUMBER NYD980531826

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) UNKNOWN

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK UNKNOWN (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE UNKNOWN (ft)

05 SOIL pH UNKNOWN

06 NET PRECIPITATION 15 (in)

07 ONE YEAR 24 HOUR RAINFALL 2.5 (in)

08 SLOPE
SITE SLOPE 0-2 %
DIRECTION OF SITE SLOPE S. W.
TERRAIN AVERAGE SLOPE 15 %

09 FLOOD POTENTIAL
SITE IS IN 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)
ESTUARINE A. 1.0 (mi)
OTHER B. (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species) NONE (mi)
ENDANGERED SPECIES:

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL A. 0.01 (mi)
RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES B. 0.01 (mi)
AGRICULTURAL LANDS
PRIME AG LAND C. (mi)
AG LAND D. 2.0 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

THE 2 COAL GASIFICATION PLANTS ARE NO LONGER IN EXISTENCE. THE ONLY REMNANTS ARE AN EXTRANCE GATE, WHICH IS PART OF CYCLONE FENCE WHICH ENCOMPASSES MOST OF THE J. J. NEWBERRY PARKING LOT, AND SOME OLD BUILDING STRUCTURES THAT BECAME PART OF THE OLD FOUNDRY BUILDING. THE AREA WHERE THE PLANTS WERE LOCATED IS GENERALLY FLAT, THE REGIONAL SLOPE IS 15% Southwest toward Catskill Creek. THE J. J. NEWBERRY PARKING LOT IS ASPHALT PAVED AND THE OLD FOUNDRY BUILDING IS PARTIALLY USED AS A BOOK STORE.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.A SITE RECONNAISSANCE 3 SEPTEMBER
NYS DOH, 1984, NEW YORK STATE ATLAS OF COMMUNITY WATER SYSTEM
U.S DEPARTMENT OF INTERIOR GEOLOGICAL SURVEY 1963 MAP OF FLOOD PRONE AREA 7.5 MINUTE SERIES HUDSON SOUTH QUAD
U.S E.P.A, 1984 UNCONTROLLED HAZARDOUS WASTE SITE RANKING SYSTEM ASSESSMENT MANUAL (HN-1)
RON ROTH, 1986, Director Green County Planning Commission, personal communication 1 OCT 1986
NYSDOT. 1976. 7.5 PLANIMETERIC SERIES HUDSON SOUTH QUAD
NYG-1980, NEW YORK STATE MAP GAZETTEER
OZARD, J. 1986. NYSDEC PERSONAL COMMUNICATION 18 SEPTEMBER 86
LUDO, VINCENT. 1986. GCAEA PERSONNAL COMMUNICATION 9 OCTOBER 86

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE: NY

02 SITE NUMBER: NYD980531826

II. SAMPLES TAKEN NONE

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
ORGANIC VAPORS	HNu METER READINGS WERE TAKEN IN THE SITE AREA. (FIGURE 1-2) NO ORGANICS ABOVE BACKGROUND LEVELS WERE NOTED

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF E.A. SCIENCE AND TECHNOLOGY, INC
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS EA Science + Technology, Inc.

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E.A. SITE RECONNAISSANCE 3 SEPTEMBER 86

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE NY
02 SITE NUMBER NYD980531826

II. CURRENT OWNER(S)

01 NAME LOT A&B FIRST NATIONAL BANK OF BOSTON
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) C/O J.J. NEWBERRY/ TAX DEPT 888 SEVENTH AVE.
04 SIC CODE
05 CITY NEW YORK
06 STATE NY
07 ZIP CODE 10019

01 NAME PART OF LOT C BARBARA A. MCDONALD
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 125 WATER STREET
04 SIC CODE
05 CITY CATSKILL
06 STATE NY
07 ZIP CODE 12414

01 NAME LOT 3 CARL AND EVA YANNIOE
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 342 MAIN STREET
04 SIC CODE
05 CITY CATSKILL
06 STATE NY
07 ZIP CODE 12414

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

08 NAME
09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)
11 SIC CODE
12 CITY
13 STATE
14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME LOT A&B CH&E CORP.
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 284 SOUTH AVE
04 SIC CODE
05 CITY POUCHKEEPSIE
06 STATE NY
07 ZIP CODE 12601

01 NAME LOT C CATSKILL FOUNDRY AND MACHINE WORKS
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) WATER STREET
04 SIC CODE
05 CITY CATSKILL
06 STATE NY
07 ZIP CODE 12414

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

APPENDIX 1.1-1, AND 1.1-2
CHAPTER 3

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: NYD980531526

II. CURRENT OPERATOR *(Provide if different from owner)* NONE

01 NAME
02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE
08 YEARS OF OPERATION
09 NAME OF OWNER

OPERATOR'S PARENT COMPANY *(If applicable)*

10 NAME
11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
13 SIC CODE
14 CITY
15 STATE
16 ZIP CODE

III. PREVIOUS OPERATOR(S) *(List most recent first; provide only if different from owner)*

01 NAME
02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE
08 YEARS OF OPERATION
09 NAME OF OWNER DURING THIS PERIOD

01 NAME
02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE
08 YEARS OF OPERATION
09 NAME OF OWNER DURING THIS PERIOD

01 NAME
02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE
08 YEARS OF OPERATION
09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES *(If applicable)*

10 NAME
11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
13 SIC CODE
14 CITY
15 STATE
16 ZIP CODE

10 NAME
11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
13 SIC CODE
14 CITY
15 STATE
16 ZIP CODE

10 NAME
11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*
13 SIC CODE
14 CITY
15 STATE
16 ZIP CODE

IV. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

CENTRAL HUDSON GAS AND ELECTRIC, Corp. HISTORY RECORDE

CHAPTER 3

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	NYD-980531820

II. ON-SITE GENERATOR N/A

01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S) N/A

01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S) N/A

01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE NY

02 SITE NUMBER NYD980531826

II. PAST RESPONSE ACTIVITIES NONE

01 ☐ A. WATER SUPPLY CLOSED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ L. ENCAPSULATION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE | 02 SITE NUMBER

II PAST RESPONSE ACTIVITIES (Continued) NONE

01 ☐ R. BARRIER WALLS CONSTRUCTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ W. GAS CONTROL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ X. FIRE CONTROL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

CENTRAL HUDSON G&E HISTORY RECORDS

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE NY

02 SITE NUMBER NYD950531826

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY/
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

EPA FORM 2070-13 (7-81)

6. Recommendations

6. ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

6.1 ADEQUACY OF EXISTING DATA

The available data are considered insufficient to prepare a final HRS score for this site. There is no documentation of hazardous waste or contamination at the former Catskill Gas Plant site. Ground-water, surface water, soil, and sediment quality data are lacking.

6.2 RECOMMENDATIONS

In order to prepare a final HRS score for this site, analytical data regarding the quality of the ground water, surface water, soil, and sediment, as well as characterization of waste (if present) will be necessary, thus requiring performance of a Phase II investigation. The proposed Phase II study would include the performance of a soil vapor survey, installation of 7 observation wells, and the collection and analysis of ground-water, surface water, soil, and sediment samples.

6.3 PHASE II WORK PLAN

6.3.1 Task 1 - Mobilization and Site Reconnaissance

Project mobilization includes review of the Phase I report and updating the site database with any new information made available since completion of the Phase I report. Based on that review, a scope of work for this site will be agreed to and a project schedule developed. At this time, a draft Quality Assurance/Quality Control (QA/QC) document will be prepared in accordance with the most up-to-date NYSDEC guidelines.

Site reconnaissance will be performed to examine general site access for Phase II studies. Site reconnaissance will familiarize key project personnel with the site, enable the project geologists to evaluate current accessibility to tentative boring/well locations, and enable the project Health and Safety Officer to develop specific health and safety requirements for the field activities. Emergency, fire, and hospital services will be identified. Based on the Phase I study, it is expected that field activities will require only Level D health and safety protective measures.

6.3.2 Task 2 - Preparation of Final Sampling Plan

All data collected during Tasks 1 and 2 will be evaluated to finalize sampling and boring/well locations. The final sampling plan will be developed and submitted to CHG&E for approval. The plan will include final drilling and sampling locations and methods, boring and well specifications, and reference pertinent portions of the QA/QC Plan. A final budget will be developed to complete the drilling and sampling program.

6.3.3 Task 3 - Soil Vapor Survey

Performance of a soil vapor survey at the former Catskill Gas Plant site is recommended to obtain preliminary data with respect to potential subsurface volatile organic contaminant conditions at the site. The results of this survey will aid in the selection of final test boring/monitoring well locations.

The soil vapor survey will be initiated by griding the site. The site dimensions and data needs indicate that an approximately 30-ft soil vapor sample grid spacing will be appropriate. The spacing and site configuration would yield approximately 15 sampling locations.

After the grid is established, soil vapor samples will be obtained through a 3/4-in. diameter stainless steel point sampler. The sampler will be driven to an anticipated depth of 2-3 ft below grade with a slide hammer. Following the installation of the point sampler, a vacuum will be applied to the sampler head with a portable pump until a near steady state condition is established within the sampling apparatus. After a near steady state condition is established, a sample will be collected and analyzed using a 2-phased approach.

The first phase will consist of obtaining a gross organic vapor level reading using a Photovac TIP, or similar instrument. The data generated will be used both as direct input into the assessment, and as a means to determine the appropriate volume of soil vapor to inject into the gas chromatograph (second phase). The second phase will consist of soil vapor analysis using a portable gas chromatograph. For quality control, this instrument will be calibrated by injecting standards and ambient air blanks approximately every 2-4 hours of use throughout the day. Selected samples will be analyzed in duplicate.

6.3.4 Task 4 - Test Borings and Observations Wells

Based upon currently available information, the drilling program is proposed to include the installation of a total of 7 observation wells (one upgradient of each of the 3 site portions and a total of 4 downgradient wells). Tentative well locations are shown on Figure 6-1. The results of the soil vapor survey (Task 3) will aid in final location of the wells. Each well is proposed to be completed within the upper 10 ft of the first ground water encountered, currently anticipated to be within the unconsolidated sediment. The available data indicates that the depth to ground water is probably about 5 ft below grade (Section 4.3). This work would be performed under the fulltime supervision of a geologist. It is anticipated that hollow-stem auger drilling method will be used in the unconsolidated sediment. Prior to the drilling of each boring/well, and at the completion of the last boring/well, the drilling equipment which comes in contact with subsurface materials will be steam-cleaned, as well as the split-spoon after obtaining each sample. In order to better evaluate the potential presence of coal gas manufacturing waste, soil sampling will be performed continuously using a split-spoon sampler to a depth of approximately 15 ft below grade. An HNU would be used to monitor the potential organic vapors emitted during drilling operations and from each soil sample. Soil samples exhibiting high HNU readings will be considered for chemical analysis. Samples of major soil/unconsolidated sediment layers will be collected for grain-size and/or Atterburg Limits analysis.

Standard construction of such a well would include 10 ft of 2-in. diameter threaded-joint PVC screen and an appropriate length of PVC riser with a bottom plug cap, sand pack, bentonite seal, and protective surficial steel casing with a locking cap.

Upon completion and development of the wells by air surging/pumping, the vertical elevation of the upper rim of each well casing and the horizontal location will be surveyed in order to aid in evaluation of the ground-water flow direction. Depending upon the yield of each Phase II well, a short-term, low-yield pumping test will be performed in each well.

6.3.5 Task 5 - Sampling

All sampling and analysis will be conducted in accordance with the project QA/QC Plan. The analytical program for every water and sediment sample will include: cyanide, ammonia, sulfate, trace metals, volatile organic compounds, and base/neutral and acid extractable compounds. Based upon the currently available information, collection and analysis of the following numbers and types of samples is recommended:

7 Ground-water samples (one from each Phase II well).

7 Soil or waste samples (one sample from each boring which exhibits unusual soil coloration, visible waste product or a high HNU (or similar instrument) reading.

5 Surface water and sediment samples collected from Catskill Creek.

Tentative sampling locations are shown in Figure 6-1.

6.3.6 Task 6 - Contamination Assessment

The data obtained during the records search and field investigation will be evaluated and used to: prepare final HRS scores and documentation forms; complete EPA Form 2070-13; summarize site history, site characteristics, available sampling and analysis data; and determine the adequacy of the existing data to confirm release, and if there is a population at risk.

6.3.7 Task 7 - Remedial Cost Estimate

Remedial alternatives for the site will be evaluated and a list of potential options will be developed based on the information available on the nature and extent of contamination. Cost estimates for the selected potential remedial options will be computed. This work is not intended to be, or a substitute for, a formal cost effectiveness analysis of potential remedial actions.

6.3.8 Task 8 - Final Phase II Report

In accordance with current (January 1985) NYSDEC guidelines, the Phase II report will include:

a. The results of the Phase II investigation, complete with boring logs, photos, and sketches developed as part of the Phase II field work.

b. Final HRS scores with detailed documentation.

c. Selected potential remedial alternatives and associated cost estimates.

6.3.9 Task 9 - Project Management/Quality Assurance

A Project Manager will be responsible for the supervision, direction, and review of the project activities on a day-to-day basis. A Quality Assurance Officer will ensure that the QA/QC Program protocols are maintained and that the resultant analytical data are accurate.

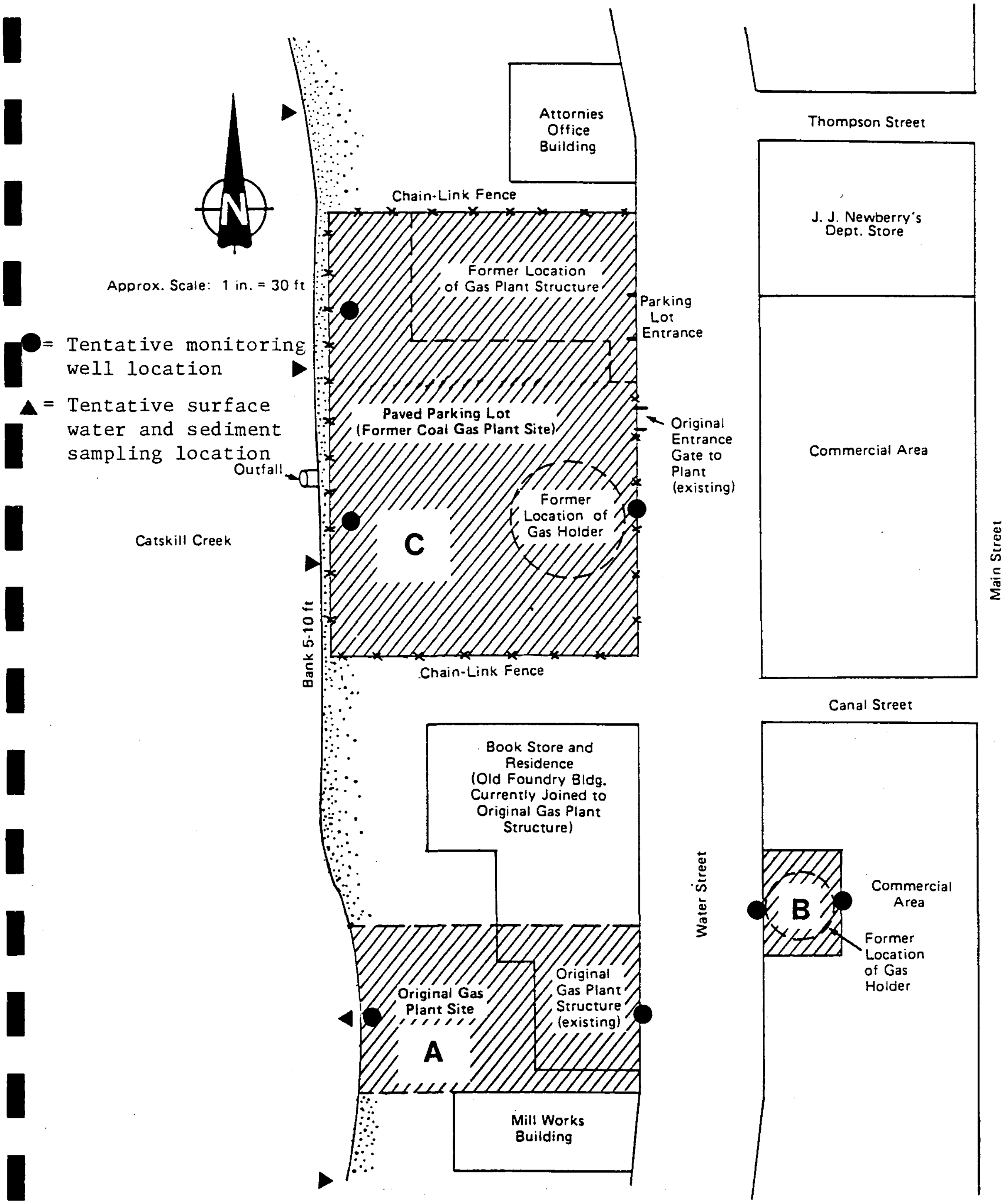
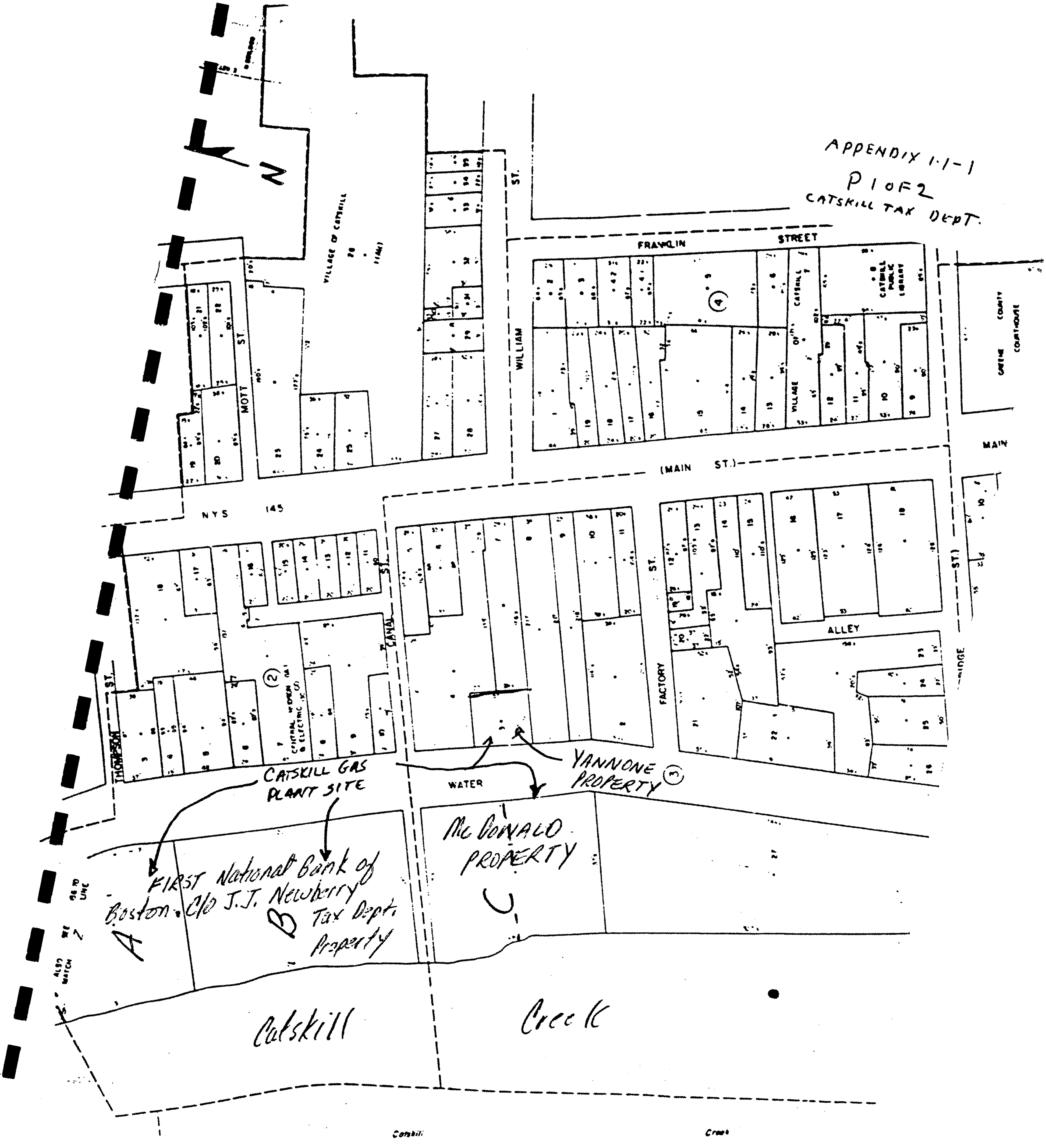


Figure 6-1. Sketch of the former Catskill Gas Plant Site. Proposed monitoring well/sampling locations for Phase II studies.

Appendix 1

APPENDIX 1-1-1
P 1 OF 2
CATSKILL TAX DEPT.



P 2 OF 2

CATSKILL TAX DEPT

CATSKILL GAS PLANT
LOCATION AND CURRENT OWNER INFORMATION

- Former gas works were located on lot numbers 1 and 2 of block 1 and lot No. 1 of block 3 of section 156.78 of property map for Greene County (lots A, B, and C on attached figure, respectively).

- Recorded owner of lots "A" and "B":

  First National Bank of Boston
  C/O J.J. Newberry Tax Department
  888 7th Avenue
  New York, New York 10019

  - Deed appears on page 536 of Liber 396.
  - Date purchased: 30 September 1961.
  - Lots are currently paved parking lots for J.J. Newberry's Department Store.

- Recorded owner of lot "C":

  Barbara A. McDonald
  125 Water Street
  Catskill, New York 12414

  - Deed to property appears on page 505 of Liber 438.
  - Date purchased: 9 October 1968.
  - The southernmost half of this lot is believed to be the location of the original gas works which was sold by the Upper Hudson Electric and Railroad Company to the Catskill Foundry and Machine Company in June 1925 (prior to CHG&E's acquisition of the Upper Hudson Electric and Railroad Company in 1926). Structures which housed the original facility still exist on this parcel of property.

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science and Technology, Inc.

APPENDIX 1.1-2

COMMUNICATIONS RECORD FORM

Distribution: ( ) ______, ( ) ______
( ) ______, ( ) ______
( ) Author

Person Contacted: TAX CLERK Date: 12/12/86

Phone Number: 518 943-2650 Title: TAX ASSISTANT

Affiliation: CATSKILL TAX DEPT Type of Contact: TELEPHONE

Address: 349 MAIN STREET
CATSKILL, N.Y.
12414

Person Making Contact: V. Vincent Luu
of E.A.

Communications Summary: ASK THE TAX CLERK IF SHE COULD GIVE ME THE CURRENT PROPERTY OWNER OF LOT 3, TAX MAP NO 156.35. SHE INDICATE CURRENT OWNERS ARE AS FOLLOWS:

CARL AND EVA YANNOE
342 MAIN STREET.
CATSKILL, N.Y. 12414

(see over for additional space)

Signature: V. Vincent Luu

APPENDIX 1.1-3

P 1 OF 1

SOURCE: CENTRAL HUDSON RECORDS

DEC 21 1923

NEW GAS PLANT OF THE UPPER HUDSON CO.

ONE OF MOST COMPLETE OF KIND IN COUNTRY, SAYS ENGINEER

The Upper Hudson Electric and Railroad Co. has installed a complete new gas works, removing the plant from the old gas house to the new electric light and power station. The new gas plant is double the capacity of the old one. Engineer Geo. H. Smith, of Poughkeepsie, who has been supervising the installation of the plant, said today that it would be the most up-to-date and complete coal gas plant of its size in the country. The equipment is furnished by the Russell Engineering Co. whose office is in New York.

There has been some trouble from poor quality of gas since the new plant was put in operation. Engineer Smith told a Daily Mail reporter this morning that in setting a new equipment is is necessary to allow for expansion of the brickwork and the bases of the generators, which resulted in the poorer quality of the gas, but that this difficulty would probably be overcome by tonight. Some sections of the village cleared up this morning.

The old gas plant was established in Catskill in 1858. The new plant of double capacity is evidence of the growing local business of the Upper Hudson Company.

~~F. A. BERNES~~

~~L. P. PERRY.~~

~~[illegible]~~

~~A. B. BEAL~~

~~R. J. GANNIFF~~

~~E. V. ROSE~~

~~[illegible]~~

~~[illegible]~~

~~[illegible]D~~

APPENDIX 1·1-4
P 1 of 3

August 1984

DRAFT

SURVEY OF TAR WASTE DISPOSAL AND LOCATIONS OF TOWN GAS PRODUCERS

p 2 of 3

August 1984

"This document has not been peer and administratively reviewed within EPA and is for internal use/distribution only"

SURVEY OF TAR WASTE DISPOSAL AND LOCATIONS OF TOWN GAS PRODUCERS

Radian Corporation
7655 Old Springhouse Road
McLean, Virginia 22102

Contract No. 68-02-3137

EPA Project Officer: William J. Rhodes

Advanced Processes Branch
Industrial Environmental Research Laboratory
Research Triangle Park, NC 27711

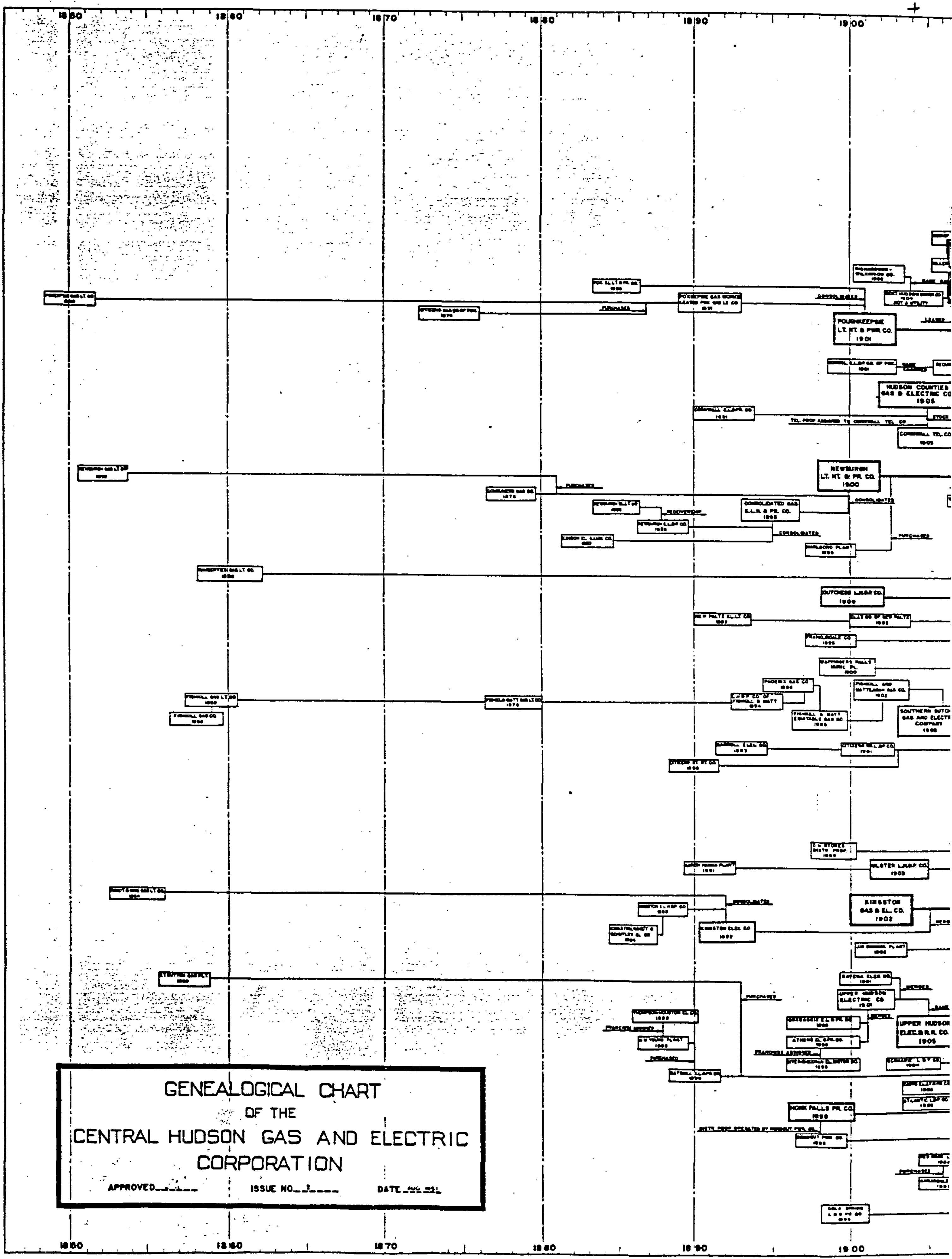
Prepared for:

Office of Environmental Engineering & Technology
Office of Research and Development
U. S. Environmental Protection Agency
Washington, D.C. 20460

[illegible] - ALL PLANTS (1890-1950)

					GAS PRODUCTION RATE (MM cu.ft./YR)					GASIFIER/	******BY-PRODUCTS********				
[illegible] CITY		YEAR	STATUS	GAS TYPE	Coal	Water	Oil	Coke	Total	PROCESS	Coke	Tar	Ammonia	Other	MISCELLANEOUS INFORMATION
21 Buffalo	Citizen's G Co	1890	*	C	100				100						
		1900	C												Cons. w/Buffalo GL Co
		1910	-												
		1920	-												
		1930	-												
		1940	-												
		1950	-												
		AVERAGES:			100				100						
22 Canandaigua	" G L Co	1890	*	C	8				8						
		1900	*	C	6				6						
		1910	*	C	20				20						
		1920	0												
		1930	0												
		1940	-												
		1950	-												
		AVERAGES:			11				11						
23 Catskill	" Gas Works	1890	*	C	3				3						
		1900	*	C	6				6						
		1910	*	C	9				9						
		1920	*	C	11				11		(1)	(3)			
		1930	*	C	24				24		(1)	33			
		1940	0												
		1950	0												
		AVERAGES:			11				11			33			
24 Clifton	Staten Island G L Co	1890	*	W		36			36	Flannery					
		1900	0												
		1910	0												
		1920	-												
		1930	-												
		1940	-												
		1950	-												
		AVERAGES:				36			36						

P 3 oF 3



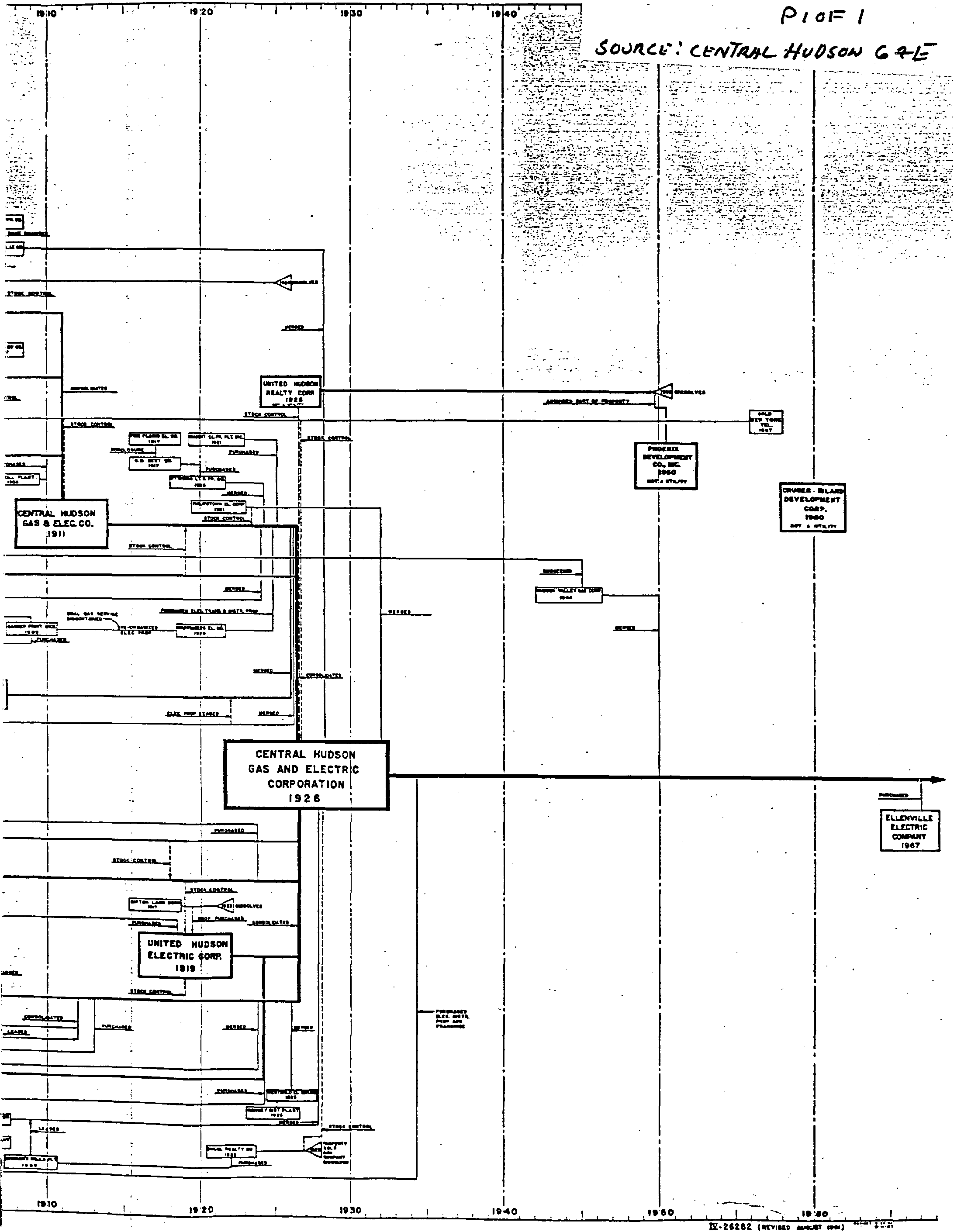
GENEALOGICAL CHART

OF THE

CENTRAL HUDSON GAS AND ELECTRIC CORPORATION

APPROVED_______ ISSUE NO.__1____ DATE AUG 1931

APPENDIX 1·1-5
P1 of 1
SOURCE: CENTRAL HUDSON G&E



APPENDIX 1.1-6
P1OF1
SOURCE: CENTRAL HUDSON G+E

Probably 1899
This appears to be parcel #8
Emily H Cooke, executrix to
C I + P C. 10/7/1899

July 18",   9.

Mr. A. [illegible] Young,
100 Broadway, N. Y.

Dear Sir,-

I have heard nothing as yet from Mr. Shepardson regarding Mr. [illegible]. I presume he is trying to arrange it so he will not be crippled [illegible]. I thought possibly Mr. Shepardson might be sick, not hearing from him.

I have consummated the deal for the purchase of the dock property and finally got it for $2750 by pretending if we did not get for that figure at once, we would withdraw our offer. It is an absolute necessity on account of coal shed and some future time putting up a stack [illegible], that we have additional land. We have bought the entire piece for what you once offered $2500 for fifty feet. The lot is one hundred five feet on the road, one hundred six feet on the river and one hundred and forty-eight feet deep. We will just take the fence down at the side and put it up in front, running from the front of the Electric Light Station to the Bulkley ice house; that will shut off the property just as securely, and will make it look much better. We will have dumping ground for ashes a long time before we will be obliged to draw any away. It is a dock that needs some filling in. I remain

Very truly yours,

W S C Wiley

WSCW/A

William S. C. Wiley

APPENDIX 1.1-7
P1OF1

SOURCE: CENTRAL HUDSON G&S

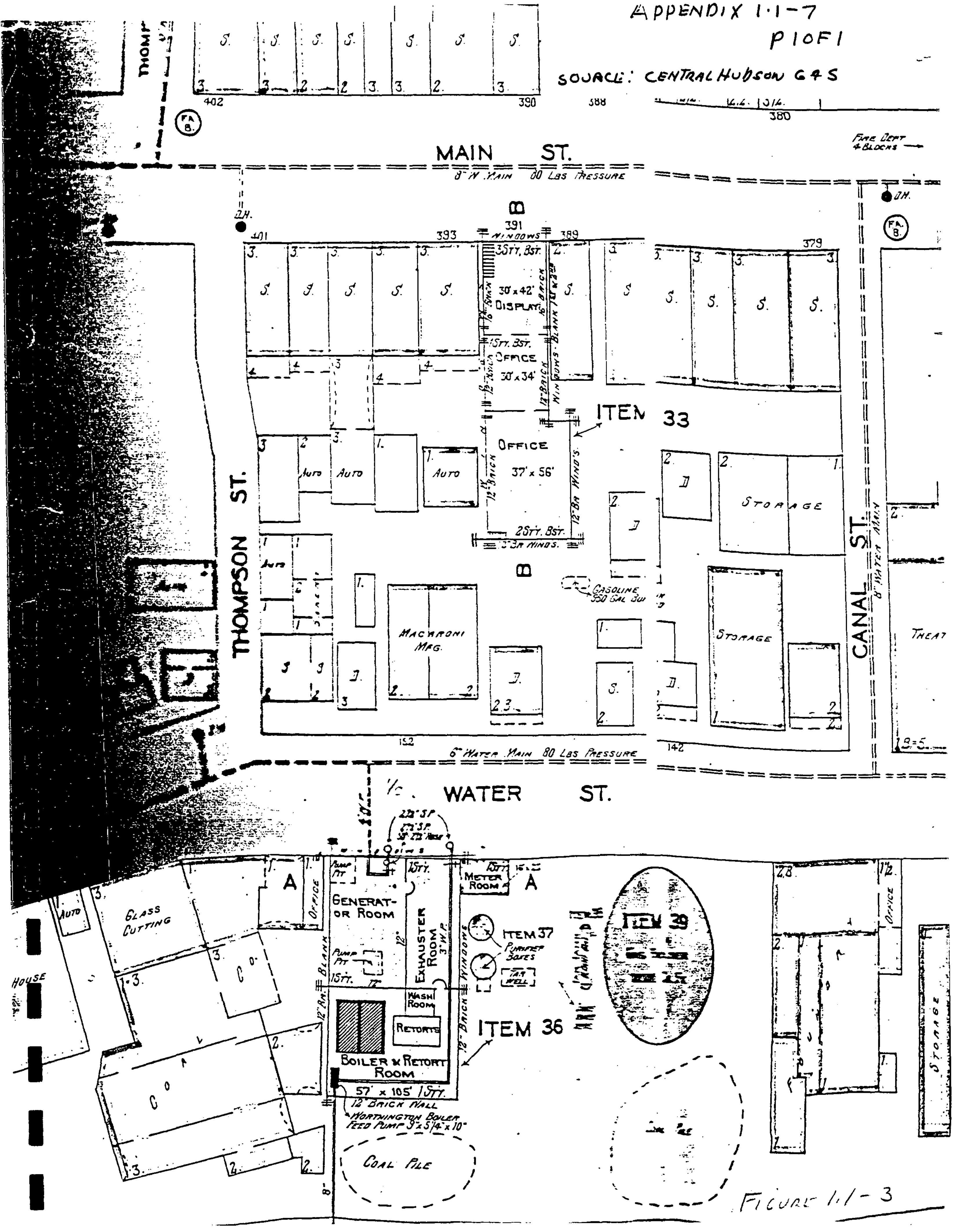


FIGURE 1.1-3

P 1 OF 2

CHG&E FILES

PPER HUDSON ELECTRIC AND RAILROAD COMPANY
CATSKILL, N. Y.

File
RBM

CATSKILL, March 10, 1925.

Mr. R. B. MacGuinness,
United Hudson Electric Corp.,
Poughkeepsie, N. Y.

Dear Sir:

RE: OLD GAS PLANT, WATER ST., CATSKILL.

As you are aware we have been endeavoring for some time to dispose of the old gas plant and up to date the best price we have been able to get for it has been $4000.00. This price is not approved by either the Advisory Board or myself and following your suggestion that we attempt to put the place in a more presentable condition we have just recently gone over the building and have the following suggestions to offer.

However, before offering my suggestions I would like to first acquaint you with another thought in connection with the use of this property.

It is true that sooner or later we will have to provide more office space, also better storeroom facilities, and as the only land we have is that space about the gas works which is nearly all taken up by the gas department, it would seem to me that perhaps we could utilize the old gas plant property ourselves. At the present time we are paying storage for our Mack truck as we are unable to get it in the basement of our office building as it is too large, and the suggestions I have to offer regarding the old gas plant property would provide for the storage of the truck at that location.

I offer the following:-

That the coal shed at the old gas works be torn down; that the roofing and heavy timbers be used to repair the roof on the oil engine plant at Coeymans, thus saving considerable cost in the repairs to that building.

That the benches be torn down and that the brick be used to fill up the purifying room, or rather the hole left by the removal of the two purifying boxes. Enough brick, however, could be saved from the benches to make the brick floor where the old boilers originally set. This brick could be grouted in and at that portion of the building where the old boilers were and this could be used as a garage for the Mack truck and possibly our other linemen's truck. This would necessitate, however, the putting on of double doors in the rear of the building; that the inside of the building be washed down and painted, and also that the outside of the building be painted. There would still be enough room left in the building for the storing of crossarms and other line material including transformers.

This work could all be done by our own people and it is estimated it would cost around $1000.00. There would be a saving by reason of the lumber we could save from the old coal shed and which could be used at Coeymans.

If the Advisory Board would at all consider the removal of the old coal shed I would suggest that Mr. Bundy send someone to look over the building at Ravena and give us an estimate as to the cost of repairing the roof to that building, and also to look over the

APPENDIX 1.1-9

CHG&E FILES

Catskill Daily Mail

June 2 1925

OLD GAS WORKS SOLD

Catskill Foundry and Machine Company Obtains Possession of Property

Transfer of the old gas works property on the west side of Water Street, between the Catskill Foundry and Machine Works and the Union Mill, has been made by the Upper Hudson Electric & Railroad Co., to L. S. Parker, of Brooklyn. The property includes the brick building occupied for many years by the Catskill Gas Co., and sheds in the rear.

George E. D. Parker, President of the Catskill Foundry & Machine Co., said today that eventually this property would be used to enlarge the present plant, but that no immediate steps in that direction were contemplated. "We purchased the property while it was available," said Mr. Parker, "and some day may enlarge our plant."

[redacted]

APPENDIX 1.1-10

CHC4E FILES

J4-1T

[illegible]

HARRY B. MORRIS

REAL ESTATE INSURANCE

195 SPRING STREET

CATSKILL-ON-THE-HUDSON, N. Y.

June 3d, I925

Mr. W. K. Hagginbotham,
Hotel St. Claire,
Atlantic City, N. J.

Dear Friend:

At last the old gas plant in Catskill has been sold to the Catskill Foundry & Machine Works.

I worked earnestly and faithfully with Mr. Parker ever since you authorized me to sell this property for the Upper Hudson Electric & R. R. Co. At one particular time I was with Mr. Parker and Mr. Van Tine for fully two hours endeavoring to convince them that the old gas plant property was what they should buy to enlarge their Foundry & Machine Works= On several other occasions I interviewed and had long talks with Mr. Parker on the advantages of his buying that particular piece of property. That it was eventually bought by this concern fully convinces me that my persuasion and endeavors to sell this piece of property to them has been carried out.

Will you kindly take this matter up with your concern and fully explain to those officials that I was authorized to sell that property and eventually it was sold to the above-named concern?

I attribute the sale to my efforts for I recall that Mr. Parker contemplated buying and building along the West Shore R.R. I think I fully convinced him that It was to his advantage to buy the adjoining property and enlarge his present plant for convenience and accessibility. It was for economical reasons this particular effort was advanced, to which he acquiesced, and acknowled at the time that my views were convincing .

In acting in good faith in this matter, on your authorization to work up that customer--Mr. Parker--I labored under those terms and conditions fully realizing that you would protect me.

Whether your company knows these facts I do not know, however, I trust you will explain the true situation to them so that they will act fairly by me.

Mr. Albert Bloodgood told me that he saw you at Atlantic City on Sunday. I trust that you are feeling better for your stay along the sea shore. Now for that good and healthful ozone one gets in the Catskill Mountains. We will all welcome your return to Catskill and trust you will soon be restored to a good vigorous constitution.

Sincerely yours truly,

H. B. Morris

Please preserve this letter.

CATSKILL, N. Y.

APPENDIX 1.1-11

mk

CHG4E Files

REC'D AUG 20

CATSKILL, August 19, 1925.

Mr. P. A. Burnes, Secy.,
United Hudson Electric Corp.,
Poughkeepsie, N. Y.

Dear Sir:

We beg to acknowledge receipt of check from the Irving Bank-Columbia Trust Company, refunding the sum of $4500. deposited on account of the sale of the gas works property at Catskill, N.Y., plus $20.75 for interest, and wish to advise that we have this day deposited this check in the Catskill National Bank, as requested by you and have credited the amount to the following accounts:

Account 296 - Special Deposits	$4,500.00
" 284 - Interest & Dividends Receivable	.49
" 341-2 - Misc. Interest Revenues	20.26
	$4,520.75

Very truly yours,

UPPER HUDSON ELECTRIC AND RAILROAD COMPANY,

AW Phillips

Chief Clerk.

AWPhillips/MM

FIL
P.A.

5 APPENDIX I-1-12

POUGHKEEPSIE, N.Y. APRIL 30, 1925. CHG&E FILES

RE: SALE OF OLD GAS WORKS AT CATSKILL.

Herewith find descriptions of two parcels of land that we propose to dispose of to the Catskill Foundry and Machine Company.

Will you please have these descriptions checked to be sure that only the property formerly occupied by the Gas Works and coal shed which was located between the Foundry and the Union Woolen Mills would be conveyed by this sale.

PARCEL NO. 6:

ALSO ALL that tract or parcel of land situate in the Village and Town of Catskill, County of Greene and State of New York, bounded and described as follows, viz:

Beginning at an iron pin in the ground thirty-cix feet eight inches southerly from the southeast corner of the present Foundry building formerly owned by A. & B. Wilse, and running southerly eighteen feet and four inches more or less to the Gas House formerly of Gilbert Sutton. Thence westerly on a line parallel with the south line of said Foundry Building, to the Catskill Creek; thence northerly eighteen feet four inches more or less, and thence easterly on a line parallel with the south line of said Foundry building to the place of beginning be the same more or less, and being the same premises conveyed to Gilbert T.Sutton in his life time by Alexander Wilse and Malvina M., his wife, by deed dated June 22nd, 1868, recorded in the office of the Clerk of Greene County in Liber No. 70 of Deeds, page 292, July 1st, 1868.

PARCEL NO. 7

ALSO ALL that certain lot, piece and parcel of land situated in the Village and Town of Catskill in the County of Greene, bounded as follows: on the north by a lot formerly owned by James H.Van Gordon; east by Wa~~l~~ter Street; south by the Store House formerly occupied by Charles L. Beach & Co., and on the west by the Catskill Creek, and described in the Indenture of lease executed by Eliza H. Ford and Gilbert T.Sutton, dated April 24th, 1858, and recorded in the Greene County Clerk's Office, April 24, 1858, in Book 54 of Deeds, page 312 etc. and to which lease reference is hereby made and being the same premises conveyed to Gilbert T.Sutton by Frederick H.Ford and Elnora I. Ford, his wife, by deed dated May 1st, 1873, and recorded in the Clerk's Office of Greene County, May 19th, 1873 Book 79 of Deeds 259,etc.

H.B.MacGuinness/W.

APPENDIX 1-1-13

CHG&E FILES

UPPER HUDSON ELECTRIC & R.R. CO
SEPT. 19 1925

[illegible] Old Gas Works

In accordance with resolutions passed at the last meeting, check for $4500. was received from the Irving Bank-Columbia Trust Company, being return of similar amount deposited with them on May 18, 1925 to secure their consent to the release of the old gas works property at Catskill from under the lien of the First Mortgage so that it could be sold and title transferred to Leban S. Parker of the Catskill Foundry & Machine Co.

This completes the transaction.

FILE

APPENDIX 1.1-14

CHG&E FILES

Jan 1932

CHANGING FROM COAL GAS TO BUTANE-AIR - GAS

Early in 1931 the Central Hudson Gas & Electric Corporation decided to install a butane-air gas plant at Catskill. Catskill is the geographic gateway to the Catskill Mountain region and as such, enjoys a heavy summer tourist and vacation trade. The gas load increases considerably during the summer months, so the changeover was scheduled for the month of June, to precede this peak season. Catskill has a population of 5,000 with 1,000 meters and a total of about 1,800 appliances of every make and description. The distribution system covers 15 miles of main, 1" to 8" in diameter and services ranging in eise from 1/2" to 3".

Coal gas of 585 B.t.u. per cubic foot with a gravity of .42 (air=1) was supplied the village prior to the advent of the butane-air gas; and the problem of changing the system and utilization equipment to the new gas of 1.16 gravity and 537 B.t.u. proved on investigation to be a major one. All available literature was searched for information on the subject, but little could be obtained from this source. To secure definite information, the writer, therefore, made a visit to an eastern plant converted during 1930 from carburetted water gas to butane air gas, and obtained considerable data, but found they were still having difficulty with some appliances.

In view of these conditions we decided that it would be nesessary to carefully study our problem. Our first move was to make a complete survey of the appliances in the territory and then select the major types and conduct laboratory tests to determine the necessary changes to the burners and equipment. In our case much depended on this survey, as we had no reliable index as to the appliances, or their condition, in the district. A crew of

APPENDIX 1.1-15
P 1 OF 20

EA Report CHG61B

THE MANUFACTURED COAL GAS INDUSTRY
A WHITE PAPER PERSPECTIVE

Prepared for

Central Hudson Gas and Electric Corporation
284 South Avenue
Poughkeepsie, New York 12602

Prepared by

EA Science and Technology
R.D. 2, Goshen Turnpike
Middletown, New York 10940

May 1986

P 2 of 20

2. MANUFACTURED GAS INDUSTRY HISTORY

The manufactured gas industry had its birth in Europe in about 1792 when several researchers from Belgium (Minckelers), France (Lebon), and Britain (Murdoch) conceived the idea of using gas from coal for illumination (Wilson and Stevens 1981). Murdoch, however, is usually given credit for development of the concept. By 1805, several factories in the Salford area of England were illuminated by manufactured gas. It was about this time that the first public gas works was erected, also in Salford (Parkington 1946). From 1805 until the early twentieth century, the coal gas industry in Europe grew. This growth developed to the extent that nearly every town and village had its own gas manufacturing facility. Until 1933, when the use of electricity for domestic illumination became common, illumination was the primary use for manufactured gas. The advent of electricity spawned the development of appliances and heating systems that used manufactured gas. In the late 1950s and early 1960s, many of the manufactured gas plants in England were converted from coal to oil, and by 1979 the country had converted entirely to natural gas.

The manufactured gas industry in the United States had a similar history. The first gas plant in the United States was constructed in Baltimore, Maryland, in 1816. From this time until the early twentieth century, the manufactured gas industry grew rapidly. The largest and most dense distribution of gas manufacturing facilities was concentrated near large metropolitan centers such as New York and Philadelphia. The advent of natural gas pipelines and petroleum distribution systems in the late 1950s and early 1960s brought an end to the manufactured gas industry in the United States. Most plants have now been demolished or have at least been retired.

2.1 PROCESSES USED TO MANUFACTURE GAS

Gas was produced from coal using a variety of processes. Among these, the following were employed most commonly:

- Carbonization
- Blue gas
- Water gas
- Producer gas

These four processes are described in the sections that follow.

2.1.1 The Carbonization Process

Gas was produced through the carbonization process by heating coal to an incandescent state at which time a gas composed primarily of carbon monoxide, methane, and hydrogen was liberated. Coke was a by-product of the carbonization process. Carbonization was initially carried out in retorts of various configurations and the gas produced was termed retort gas (Table 2-1). Early retorts were of horizontal configuration and operated continuously. As the

P3oF20

TABLE 2-1 TYPICAL RETORT CAS COMPOSITION

Constituent	Intermittent Retort (Volume %)	Continuous Retort (Volume %)
Carbon dioxide	2.1	3.0
Illuminants(a)	3.4	2.8
Oxygen	0.4	0.2
Carbon monoxide	13.5	10.9
Hydrogen	51.9	54.9
Methane	24.3	24.2
Nitrogen	4.4	4.4
BTU/ft3	520	532
Specific gravity	0.42	0.42

(a) Likely included: ethylene, propylene, butylene, acetylene, and unsaturated aromatic hydrocarbon.

Source: ERT and Koppers (1984).

process evolved, the retorts were designed in a vertical orientation and had the capability to operate continuously or intermittently. Continuously operated retorts featured a continuous feed of coal from storage bins at the top of the retort and a continuous discharge of coke from the bottom. An intermittently operated retort featured coal fed into the process in batches from which coke was discharged after each carbonization cycle. Vertical retorts were generally constructed in settings of four to six. The retorts proper were constructed of interlocking silica bricks. The retorts were heated with producer or coke oven gas which was a low quality gas often a by-product of commercial coke production. The primary by-product of retort gas production was coke which was used for domestic heating.

Vertical retorts were manufactured by a number of companies. Among these were United Gas Improvement (UGI) and the Koppers Corporation. Examples of the intermittent and continuous retort processes used by these two companies are depicted in Figures 2-1 and 2-2, respectively.

As the coal gas industry evolved, the coke oven gas production process became more prevalent. In this process, bituminous coal was carbonized at high temperatures in by-product coke ovens. The gas produced was generally treated to remove tar, ammonia, naphthalene, and sulfur. Figure 2-3 is a representation of the coking gas process. Gas produced for commercial purposes was a by-product of the coking process. The primary products were coke and gas to operate the coke oven. The heating value of coke oven gas was improved by removal of light oils, benzene, toluene, and xylenes through a process known as debenzolization. The typical coke oven gas composition is given in Table 2-2.

2.1.2 The Blue Gas Process

Blue gas was a gas rich in carbon monoxide and hydrogen produced by passing steam over a bed of molten coke. The process, which coupled the steam-carbon reaction with carbonization, produced a gas with a heating value of about 300 BTU/ft^3. The process was generally operated in a cyclic manner. After the coke had been heated to incandescence, a blast of steam was passed over the coke bed to produce the blue gas. The steam blast drove the steam-carbon reaction

$$C + H_2O \rightleftharpoons CO + H_2$$

which is endothermic. In order to restore the incandescent state in the coke bed, air was blasted into the apparatus. This steam/air cycling was necessary, not only to maintain the required temperature, but also to reduce the concentration of nitrogen in the product gas. The blue gas generation process is depicted in Figure 2-4. The typical blue gas composition is given in Table 2-3.

2.1.3 The Water Gas Process

Water gas, which is also known as carburetted water gas or carburetted blue gas, is produced by cracking bunker C oil or gas oil in the presence of blue gas and steam. The product of this process is an enriched blue gas. While blue gas has a typical heating value of about 300 BTU/ft^3, water gas can have a

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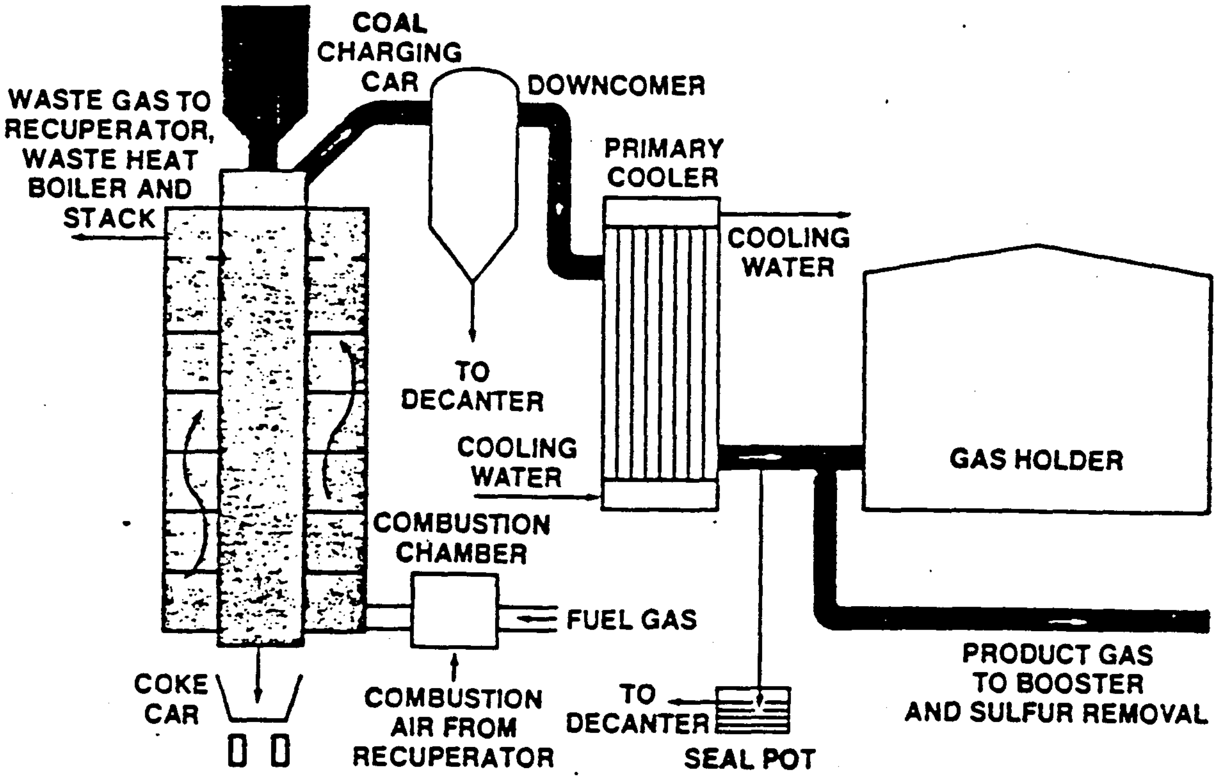

Figure 2-1. UGI Intermittent Retort (source: ERT and Koppers 1984).

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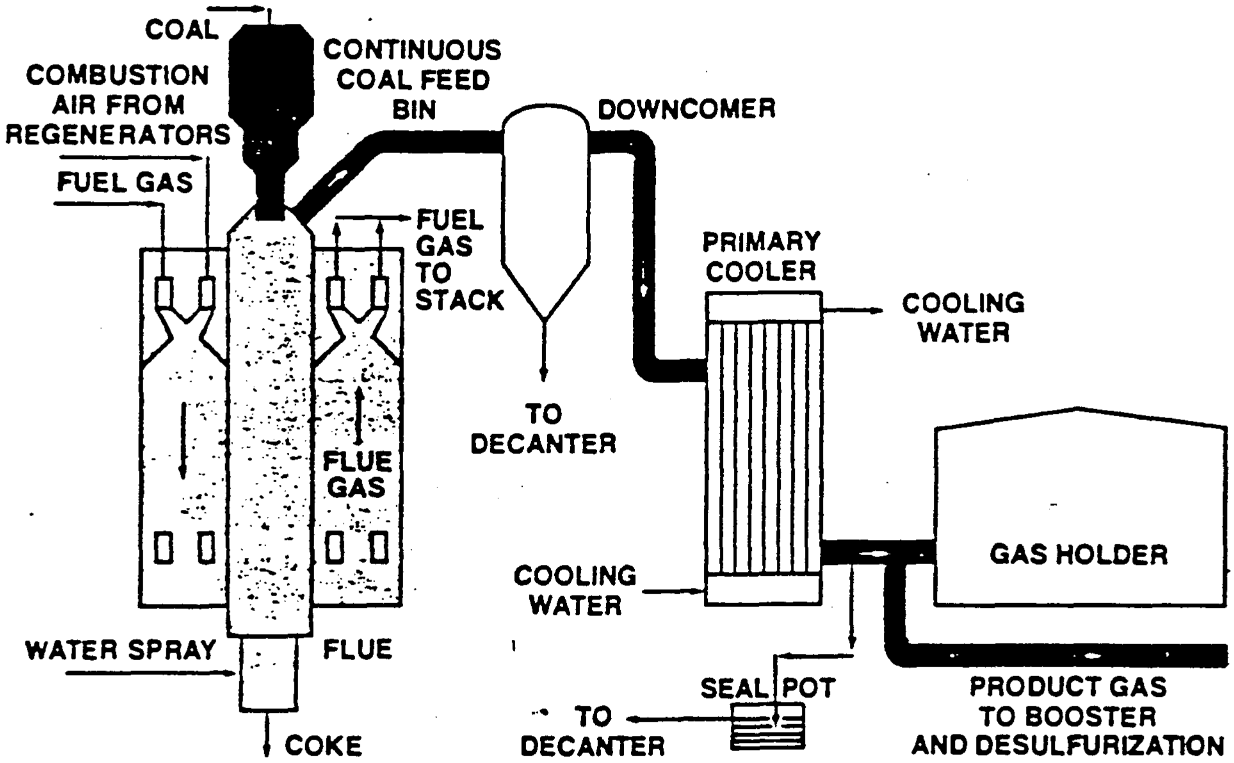

Figure 2-2. Koppers-vanAckaren Continuous Retort (source: ERT and Koppers 1984).

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TABLE 2-2 TYPICAL COKE OVEN GAS COMPOSITION

Constituent	Coke Oven (Volume %)
Carbon dioxide	2.0
Illuminants(a)	3.0
Oxygen	0.6
Carbon monoxide	6.9
Hydrogen	55.0
Methane	27.5
Nitrogen	5.0
BTU/ft^3	544
Specific gravity	0.38

(a) Likely included: ethylene, propylene, butylene, acetylene, and unsaturated aromatic hydrocarbons.

Source: ERT and Koppers (1984).

P 90F20

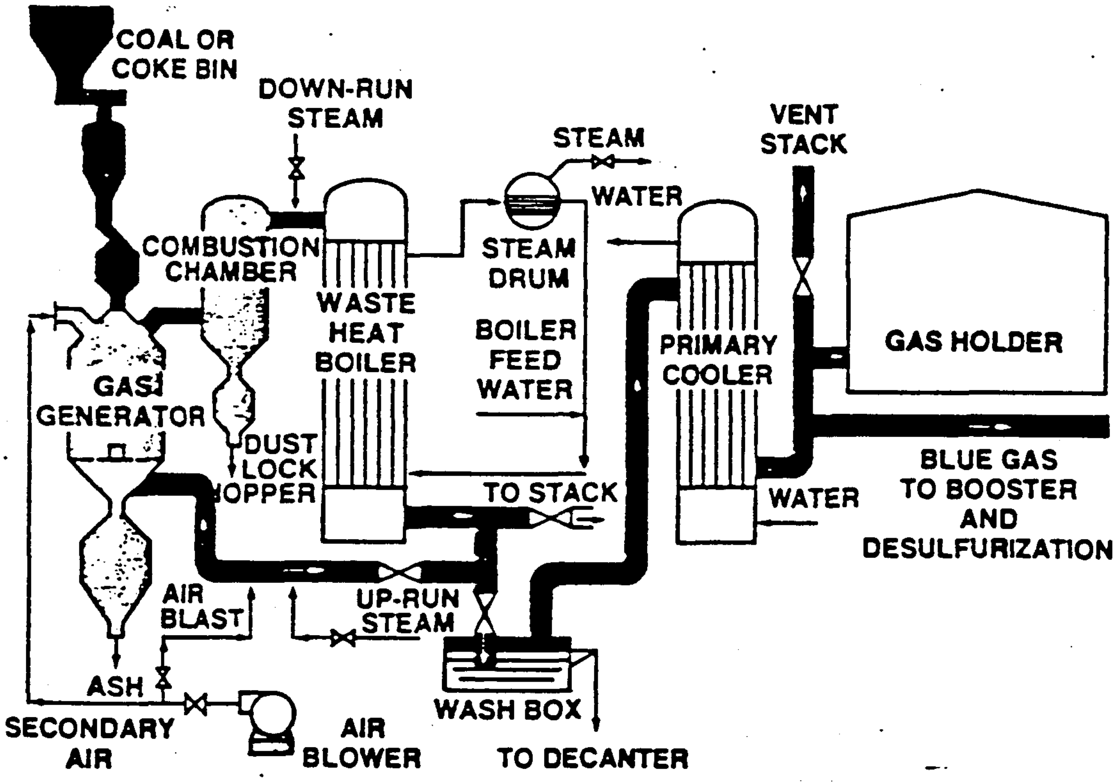

Figure 2-4. Blue Gas Process (source: ERT and Koppers 1984).

TABLE 2-3 TYPICAL BLUE GAS COMPOSITIO

Constituent	Blue Gas (Volume %)
Carbon dioxide	5.5
Carbon monoxide	37.3
Hydrogen	47.6
Methane	1.2
Nitrogen	8.4
BTU/ft3	287
Specific gravity	0.57

Source: ERT and Koppers 1984.

P11 of 20

heating value of over 1,000 BTU/ft3, although the typical heating value was about 530 BTU/ft^3. This enhancement in heating value resulted from increased concentrations of methane, ethane, and propane which resulted from the oil cracking process. Table 2-4 is a listing of typical water gas composition.

Water gas was produced in an apparatus similar to that depicted in Figure 2-5. The apparatus consisted principally of a generator, a carburetor, and a super heater. The generator was similar to that used to produce blue gas. It used coke or coal as its feed stock. The orientation was vertical and steam was injected into the coal gas stream in the generator. The generator was in turn interfaced with the carburetor in which oil was sprayed into the gas/steam product. The gas/steam/oil mixture passed into the super heater where the oil was cracked to liberate the more simple gases as indicated in Table 2-4 which lists the typical water gas composition. As was the case with blue gas, the water gas process was operated in a cyclic manner in which steam and air were alternately blasted into the fuel bed.

2.1.4 The Producer Gas Process

As was mentioned previously, producer gas was a by-product of coke production. Approximately 40 percent of the low quality gas produced was recycled through the plant and used to fire the coke ovens. Because coke was the primary fuel in this type of operation, producer gas facilities were generally associated with coking operations. Producer gas operations were generally vertically oriented operations in which fuel was fed through a hopper at the top of the device and air and steam were introduced through the bottom. The process was operated continuously and the air:steam ratio was carefully controlled to balance the exothermic and endothermic aspects of the reaction. A typical producer gas apparatus is depicted in Figure 2-6. Table 2-5 is a listing of the typical producer gas composition generated from a coke fueled unit.

2.1.5 Gas Cleanup Techniques

The gas generated in the coal gas industry was not generally of adequate quality for domestic use without cleanup. The objective of the cleanup process was to remove impurities produced with the gas to yield a product that was relatively clean burning, and did not corrode or foul the distribution system and domestic appliances. The impurities of primary concern included sulfur and its compounds, tars, ammonia, and water.

The first step in gas cleansing was cooling which caused much of the tar, water, and ammonia to condense. Additional tar and ammonia were removed by passing the gas through recirculating tar scrubbers containing tar liquor and recirculating ammonia scrubbers containing ammonia liquor, respectively. Ammonia removal also provided partial sulfur cleanup as the ammonia reacted with sulfate to produce ammonium sulfate.

Initial sulfur removal occurred during the initial gas production step with the liberation of SO_2 into the stack gases. However, it was necessary to remove additional sulfur. This removal was accomplished by passing the gas through purifiers that contained iron oxide. The sulfide in the gas stream reacted with the iron oxide in the purifiers according to the following reaction:

TABLE 2-4 TYPICAL WATER GAS COMPOSITION

Constituent	Water Gas (Volume Percent)			
Carbon Dioxide	3.4	4.3	1.6	4.4
Illuminants(a)	8.4	12.6	18.9	27.4
Oxygen	1.2	0.7	0.2	1.1
Carbon Monoxide	30.0	30.2	21.3	9.1
Hydrogen	31.7	29.3	28.0	19.9
Methane	12.2	17.8	20.7	21.8
Ethane	0.0	0.0	4.3	5.3
Propane	0.0	0.0	0.0	0.3
Nitrogen	13.1	5.1	5.0	10.7
BTU/ft^3	540	695	850	1010
Specific Gravity	0.64	0.68	0.69	0.85

(a) Likely included: ethylene, propylene, butylene, acetylene and unsaturated aromatic hydrocarbons.

Source: ERT and Koppers (1984).

P13OF20

TYPICAL WATER GAS PROCESS

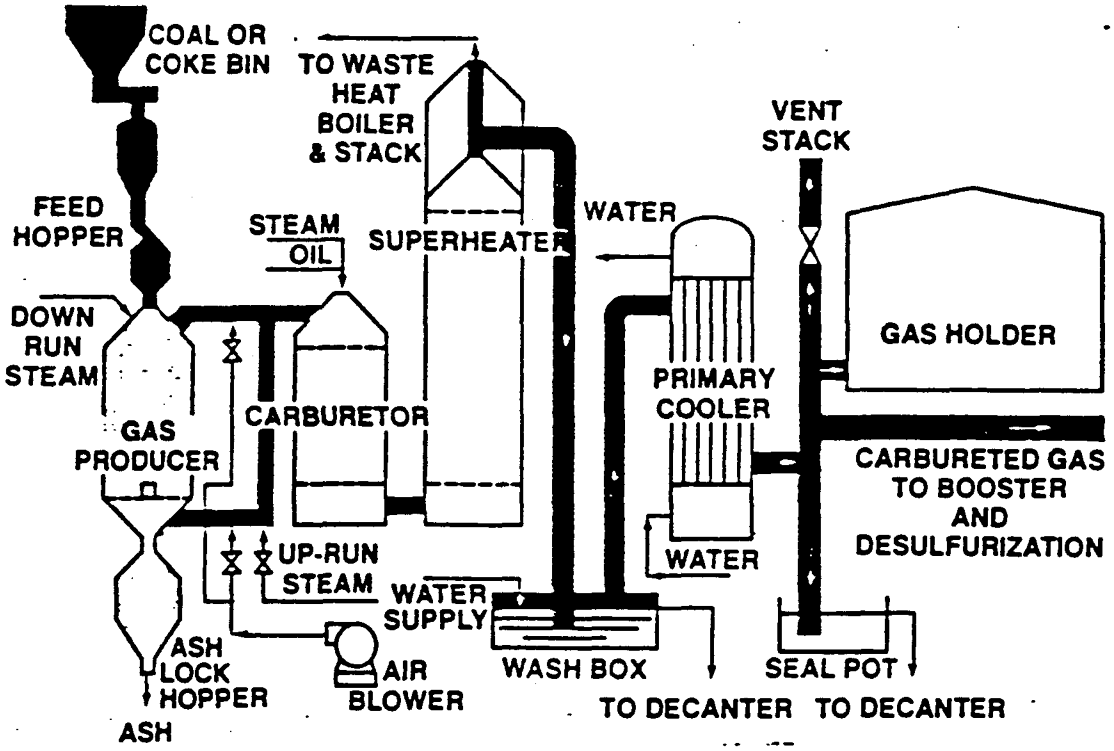

Figure 2-5. Water Gas Process (source: ERT and Koppers 1984).

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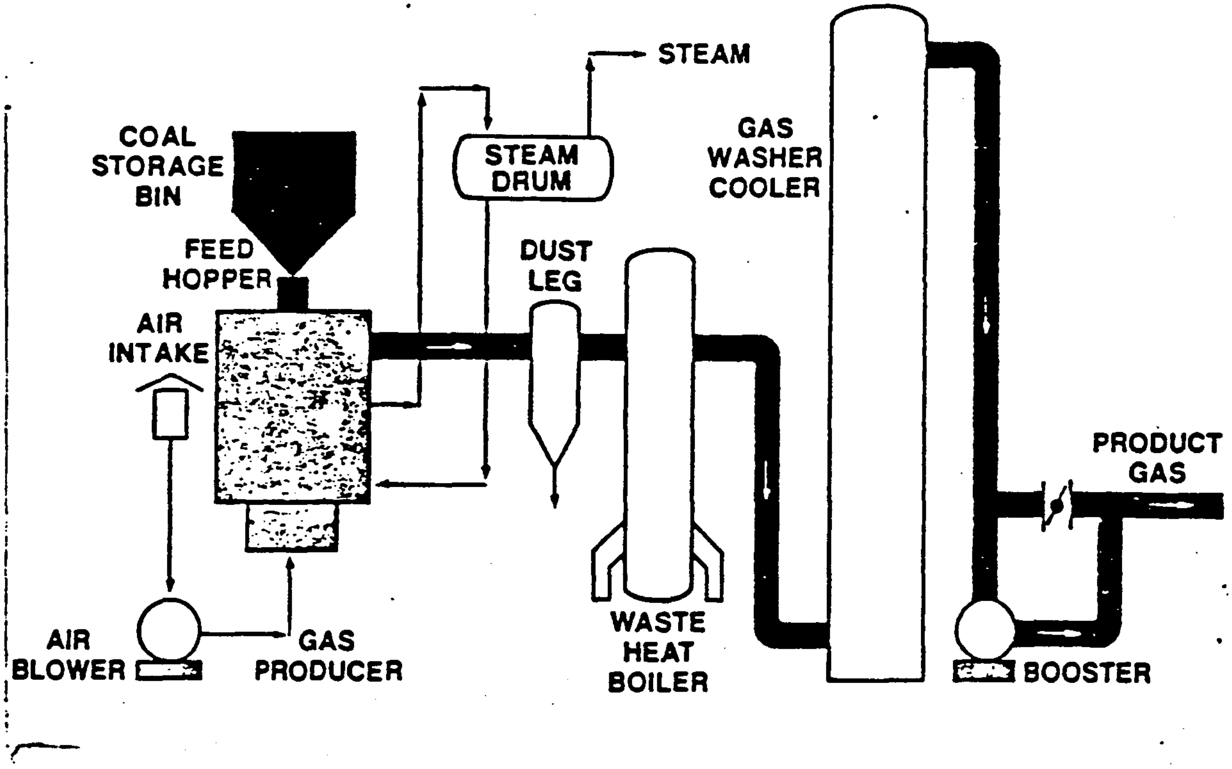

Figure 2-6. Producer Gas Process (source: ERT and Koppers 1984).

$$Fe_2O_3 \cdot H_2O + 3H_2S \longrightarrow Fe_2S_3 \cdot H_2O + 3H_2O$$

In addition to the efficiency of the process as a sulfide scavenger, the true utility of the process was founded in the capacity of the oxide to be regenerated. Regeneration was accomplished by passing clean air through the spent oxide which resulted in the following reaction:

$$2Fe_2S_3 + H_2O + 3O_2 \longrightarrow 2\ Fe_2O_3 + H_2O + 6S$$

The regeneration process was carried out numerous times on a given batch of oxide. However, when the sulfur content of the regenerated oxide reached 45 percent it was generally considered spent and handled as a waste.

An adjunct to the sulfide removal accomplished by oxide treatment was cyanide removal. Cyanogen and hydrogen cyanide in the crude gas reacted with the iron oxide and iron sulfide according to the following reactions:

$$xFeO + yFe_2O_3 + 6\ HCN \longrightarrow 3\ Fe(CN)_2 + H_2O$$

$$3FeS + 2Fe_2S_3 + 18\ HCN \longrightarrow Fe_4[Fe(CN)_6]_3 + 9\ H_2S$$

$$9Fe(CN)_2 + 3O \longrightarrow Fe_2O_3 + Fe_4[Fe(CN)_6]_3$$

Prussian Blue, or ferrous-ferric cyanide coated the iron oxide thereby reducing its efficiency. The intensity of the blue color was considered an indicator of oxide quality. The cyanide contaminated oxides were regenerated by roasting, often with wood chips or sawdust.

Lime treatment was also used to remove hydrogen sulfide, hydrogen cyanide, and carbon dioxide from crude gas. These cleanups were accomplished according to the following reactions:

$$Ca(OH)_2 + 2H_2S \longrightarrow Ca(HS)_2 + 2H_2O$$

$$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$$

$$Ca(OH)_2 + 2HCN \longrightarrow Ca(CN)_2 + 2H_2O$$

The products of these reactions were termed "foul limes" which often emitted a bad odor.

P/6 of 20

3. TYPES OF WASTES GENERATED IN COAL GAS PRODUCTION

The manufacture of coal gas resulted in production of a number of primary wastes, including:

- Tars
- Sludges
- Gas Liquor and Ammonia Liquor
- Ash, Slag, and Clinker
- Dust, Off-Grade Coal and Coke

The types of wastes that may have been produced at a given plant were, to a large extent, a function of the process-type employed. The following is a series of discussions of the sources of the primary wastes and the principle elements and compounds that may have been present in them.

Tars and tar sludges were produced to a greater or lesser extent at all coal gas manufacturing facilities. Tars were generated in large quantities in the coke production operation. Tars were also produced, but in greatly reduced quantities, when coke was heated to produce gas. Tars were a by-product of oil injection and cracking in facilities in which coal gas was enriched via this process. Tars were also by-products of the gas cleanup process. Most tars produced in the coal gas industry contained very high concentrations of polynuclear aromatic hydrocarbons (PAH). They also contained oils, creosote (phenolics), and aromatic hydrocarbons (benzene, toluene, xylenes).

A variety of sludges was produced in the coal gas manufacturing process particularly during the gas cleanup process. Examples of such sludges include spent oxide waste, tar sludge, and "foul lime." These wastes contained PAH, sulfur compounds, ammonia compounds, cyanide compounds, and to a lesser extent oils and aromatics.

Tar liquor and ammonia liquor were also produced as a function of gas cleanup. Most facilities generated these types of wastes. Tar liquor was oily and contained PAH, phenolics, and aromatics. Ammonia liquor contained ammonia and sulfur compounds.

Ash, slag, and clinker were the residues remaining after the feed stock had been consumed. The constituents of primary concern in these wastes were toxic and mobil trace metals.

Dust, off-grade coke and coal were by-products of nearly all coal gas production operations. These generally contained trace metals and sulfur compounds.

P 17 OF 20

4. TYPICAL WASTE DISPOSAL PRACTICES

Much of the waste generated in the coal gas industry was not truly waste but was recycled. A prime example of this was tar. Because the tar was highly organic and thus relatively heavy, it was frequently used as feed stock in the production of chemicals including toluene, xylenes, benzene, creosote, road oils, and coal tar based cosmetics. The tars were generally stored in tar wells until an adequate volume was accumulated at which time it was removed from the site. In some instances tar was also used as a fuel. Some larger coal gas facilities had tar distilling as a part of their operations. When sites were very small and/or remote and low volumes of tars were produced the tars were sometimes spread on the roads to control dust.

Like the tars, the ammonical wastes were valuable. The liquors form a raw product from which nitrogenous fertilizers were produced. However, when facilities were small and/or remote, ammonia liquor was sometimes spread over the site and surrounding environs. Plants that were located near waterbodies often discharged directly to them. Plants proximate to sewers often discharged directly to local sewer systems.

Spent oxide and "foul lime" were sources of sulfur and in some instances the wastes were used as resources. However, in most instances these products were considered wastes and were either disposed of on site or were removed for offsite disposal.

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5. CURRENT PERSPECTIVE

Most former coal gas manufacturing facilities have been demolished or exist as other types of operations. In some instances, the above grade aspects of the plants have been razed and the site has been overbuilt. At these locations, the subsurface aspects of the plants have often been backfilled and left in place. In other instances, some of the original manufacturing structures have been renovated and now exist as integral parts of new operations. It is frequently impossible to determine that a coal gas operation ever existed on the site when viewed from the surface.

The former coal gas manufacturing facilities are of concern today as a result of presence of waste and by-product residues left in place where the plants were retired. Six classes of compounds comprise the primary concerns at former coal gas manufacturing facilities. These include:

- Polynuclear aromatic hydrocarbons (PAH)
- Phenolics
- Light aromatics (benzene, toluene, ethylbenzene, xylenes)
- Inorganic nitrogen species
- Inorganic sulfur species
- Trace metals

Many of these constituents occur naturally and are ubiquitous in the environment. However, excessive exposure to high concentrations pose a risk to human health and the environment and are generally the focus of site investigations and risk assessments.

5.1 POLYNUCLEAR AROMATIC HYDROCARBONS

PAH as a class are relatively insoluble in water and have a very strong affinity for organic matrices. These characteristics render PAH relatively immobile in the environment. That is, they generally migrate from their site of origin very slowly, if at all. This in turn helps to reduce the population that could be exposed to them.

5.2 PHENOLICS

Phenolics are highly water soluble and are therefore highly mobil in the environment. They are readily leached from source materials that contain them and they readily biodegrade. These latter two characteristics, therefore, make the occurrence of high concentration phenolics at former coal gas manufacturing facilities less common.

The primary potential health hazard associated with phenolic compounds is acute poisoning. As little as a few grams of ingested phenol can be fatal. Phenolics are also readily absorbed through the skin and can produce toxic effects via this route of exposure. There is limited evidence from animal testing that phenolics may act as tumor promoters for carcinogenic PAH, although the relevance of this to human exposures has not been established.

P19 OF 20

Phenolics exhibit moderate toxic effects on aquatic organisms. Bioaccumulation is not a concern. There is little information on the terrestrial effects of phenolics, since they partition strongly into aquatic systems.

5.3 LIGHT AROMATICS

Benzene, toluene, ethylbenzene, and xylenes are relatively mobil in the environment. They are moderately soluble in water and have affinities for an organic matrix much lower than that of PAH. This class of compounds therefore has the potential to travel some distance from a site of generation. However, increased volatility and biodegradeability make the class somewhat less persistant in the environment.

Human exposures to light aromatics (benzene, toluene, ethylbenzene, and xylenes) occur primarily via inhalation of vapors, and ingestion of contaminted water, although skin absorption can also occur. The primary concern with chronic exposures to benzene is an increased risk of leukemia. The primary concern relative to excessive exposure to toluene, ethylbenzene, and xylenes is central nervous system dysfunction.

Light aromatics are moderately toxic to fish and other aquatic organisms. Little information is available on their terrestrial effects.

5.4 INORGANIC NITROGEN SPECIES

The primary human health concerns associated with inorganic nitrogen species are acute exposures to ammonia, hydrogen cyanide and compounds that readily liberate free cyanide. While these concerns exist, the predominant form of cyanide found at former coal gas plants is combined (i.e., metalocyanide) which is much less toxic than the ionized form. All of these compounds exhibit high acute toxicity, while chronic effects are minimal. There is, however, a potential concern with chronic exposures to nitrate in drinking water, which can cause methemoglobinemia, particularly in infants.

The aquatic toxicity of ammonia and cyanide has been studied extensively. Un-ionized ammonia is acutely toxic to aquatic species, although the ionized form (NH_4+) generally predominates in natural waters. Terrestrial effects of inorganic nitrogen species are usually not major concern, since they are part of the natural environment. While the inorganic nitrogen species can be toxic to aquatic organisms they can also serve as stimulants to aquatic plant communities thereby increasing the rate of eutrophication.

5.5 INORGANIC SULFUR SPECIES

The primary human health concern for airborne exposures to inorganic sulfur species is hydrogen sulfide, which is an irritating, malodorous and acutely toxic gas. Inorganic sulfur compounds are of but limited concern for drinking water exposures. Various sulfide and sulfate salts that may be associated with former gas plants exhibit moderate to high acute toxicity by ingestion, depending on the particular compound.

The toxicity of sulfide to aquatic life is well documented, with the undissociated form (H_2S), which predominates under acidic conditions, being the toxic species. Sulfate toxicity in aquatic systems is usually not a concern.

P20oF20

Sulfate and sulfide can produce toxic effects on plants at relatively low concentrations (mg/kg), but such effects are ill defined. A potential concern with high sulfate concentrations in soils (0.1 percent) is that sulfate attacks building materials, particularly concrete.

5.6 TRACE METALS

The health and ecological effects of trace metals are widely variable, depending on the specific element, species and route of exposure. Many of the trace metals are essential for normal metabolism and growth of organisms, including humans. However, exposure to excessive concentrations can cause toxic effects. Moreover, while numerous trace metals occur in coal, they are not expected to pose major problems at former gas plant sites. Trace elements that would be of most concern are those which have been listed as priority pollutants, namely, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc. Of these, arsenic, chromium, copper, lead, nickel and zinc are most likely to be associated with former gas plant sites.

APPENDIX 1-1-16
P 1 OF 3

NUS CORPORATION
A Halliburton Company

02-8606-12-PA

POTENTIAL HAZARDOUS WASTE SITE

PRELIMINARY ASSESSMENT

Central Hudson G & E/
Catskill Gas Plant
Site Name

NYD980531826
EPA Site ID Number

Water Street
Village of Catskill, NY 12414
Address

02-8606-12
TDD Number

Date of Site Visit: Off-site Reconnaissance Conducted, 6/27/86.

SITE DESCRIPTION

The site is a former natural gas plant. The plant was owned by Central Hudson G & E Corporation and operated until 1930. The company reported a possibility of waste spillage during operation of the plant. There is no other known waste disposal on-site.

The area of the former site is presently a completely paved area used by Newberry as a store parking lot. The site is located between Water Street and the Catskill Creek just west of the center of town in a primarily commercial area. The Catskill Creek, which is used for fishing and boating, flows along the western boarder of the parking lot. The area of the site shows no evidence of the former plant or any waste associated with it.

PRIORITY FOR FURTHER ACTION: High ___ Medium ___ Low ___ None X

RECOMMENDATIONS

A site inspection is not recommended. The site is completely covered with pavement and has no documented evidence of any significant waste disposal.

Prepared by: Stephen Maybury **of NUS Corporation**

Date: 7/15/86

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

P 2 of 3

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Central Hudson G & E/Catskill Gas Plant

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: Water Street

03 CITY: Village of Catskill

04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST.
NY	12414	Greene	039	29

09 COORDINATES

LATITUDE	LONGITUDE
42° 13' 13". N	073° 52' 03". W

10 DIRECTIONS TO SITE (Starting from nearest public road)

Take Rt. 23 to Spring Street (Rt. 385) toward the Village of Catskill. Turn right onto Bridge Street. Turn right onto Water Street at its intersection. The Newberry parking lot is on the left side.

III. RESPONSIBLE PARTIES

01 OWNER (if known): Central Hudson G & E Corporation

02 STREET (Business, mailing, residential): 284 South Avenue

03 CITY: Poughkeepsie

04 STATE: NY

05 ZIP CODE: 12602

06 TELEPHONE NUMBER: (914) 452-2000

07 OPERATOR (if known and different from owner): J.J. Newberry Co.

08 STREET (Business, mailing, residential): 403-411 Main St.

09 CITY: Catskill

10 STATE: NY

11 ZIP CODE: 12414

12 TELEPHONE NUMBER: (518) 943-3230

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: ______ (Specify) ☐ G. UNKNOWN

14. OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: / / ☒ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: 6 / 9 / 81

☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES DATE: / /

☒ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): ______

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

BEGINNING: Unknown ENDING: 1930 ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

There is no known waste on-site. There is slight potential that coal tar may have been spilled during the plants operation prior to 1930.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

There is minimal potential that any waste on-site would still be available for migration. The area where the plant is believed to have been located is completely paved. The Catskill Creek which lies on the western boarder of the parking lot is used for fishing and boating. Groundwater is used for drinking in the area.

IV. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspection on time available basis) ☒ D. NONE (No further action needed. complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Diana Messina	U.S. EPA Region II	(201) 321-6685

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Stephen E. Maybury		NUS Corp.	(201) 225-6160	7 /15 /86

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

p 3 oF 3

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☒ D. OTHER: Unknown (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE

(Measures of waste quantities must be independent)

TONS Unknown
CUBIC YARDS ______
NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE
- ☒ Unknown

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			Spillage may have occurred during operation of the coal gasification plant.
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Unknown				

FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	Coal		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (See specific references. e.g., state files, sample analysis, reports)

Notification of Hazardous Waste Site (103C) 6/9/86.

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

APPENDIX 1-1-17

COMMUNICATIONS RECORD FORM

Distribution: ( ) ____________, ( ) ____________
( ) ____________, ( ) ____________
( ) Author

Person Contacted: Mr John Amisault Date: 9/18/86

Phone Number: 518 943-9585 Title: Operator Catskill STP

Affiliation: Sewerage Authority Type of Contact: telephone

Address: Lower Main St
Catskill, N.Y.
12414

Person Making Contact: V Vincent Luci of E.A

Communications Summary: Mr Amirault stated that he knew of no problems at the Catskill Coal Gasification Plant Site. However he did state that tar has entered into the sewer system but he did not know the source of entry

(see over for additional space)

Signature: V. Vincent Luci

Site Coordinates:

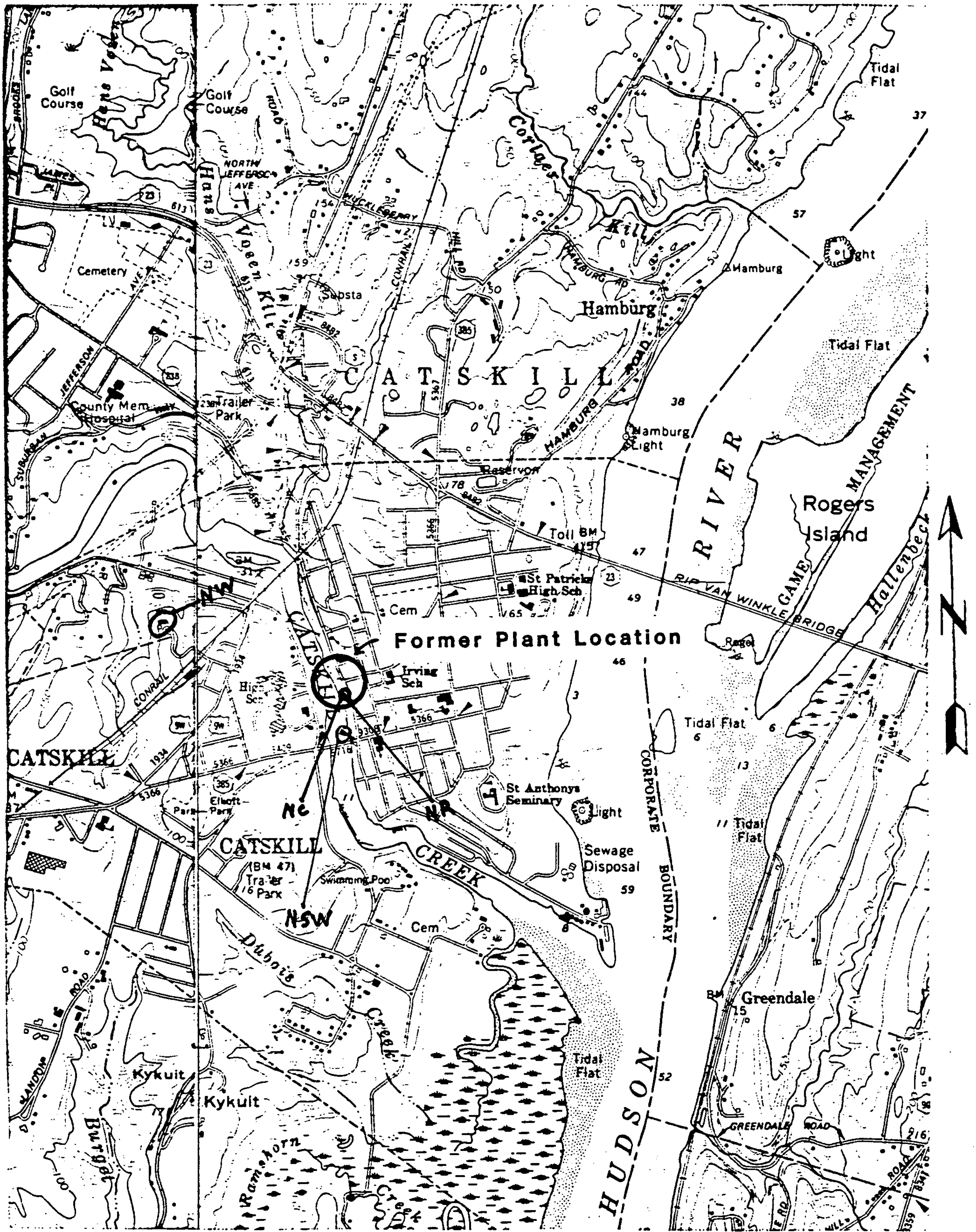
Latitude:	42° 13' 10"
Longitude:	73° 51' 57"

APPENDIX 1·2-1

SOURCE: EA SITE RECONNAISSANCE

3 SEPTEMBER 1986

CATSKILL COAL GAS PLANT



Hudson South Quad
NYSDOT 7.5-Minute Series
Dated 1976

Scale 1:24,000

Appendix 1.3-1
1 of 18
Source: NYS Water Power and Control Commission
Lc S
1004

STATE
DEPARTMENT OF CONSERVATION
WATER POWER AND CONTROL COMMISSION

THE GROUND-WATER RESOURCES OF GREENE COUNTY, NEW YORK

By
Jean M. Berdan
Geologist, U. S. Geological Survey

Prepared by the
U. S. GEOLOGICAL SURVEY IN COOPERATION WITH THE
WATER POWER AND CONTROL COMMISSION

BULLETIN GW-34
ALBANY, N. Y.
1954

N-16

Table 2.—Geologic formations in Greene County, and their water-bearing properties

Age		Geologic formation or group	Thickness (feet)	Character of material	Water-bearing properties
System	Series				
Quaternary	Recent	Alluvium	20±	Sand, silt, and gravel in stream beds.	Yields little water because of small size of most deposits. In larger valleys, large supplies locally obtained by induced infiltration from streams.
	Pleistocene	* Stratified sand and gravel	Up to 150	Fine to coarse-grained sand and gravel in interbedded lenses; many are crossbedded.	Yields appreciable quantities of ground water. Wells have average yield of 22 gallons per minute (gpm); moderate to large supplies obtainable from properly constructed wells. Water generally soft.
		* Lacustrine deposits	Up to 300	Fine clay and silt, some sand; in thin, fairly uniform, and extensive strata.	Yields little water except where very sandy.
		Till	1 to 100+	Heterogeneous mixture of gravel, sand, clay, and boulders, with a predominance of clay.	Yields small supplies to dug wells, chiefly for domestic and farm purposes. Water ranges from soft to hard.
Devonian	Upper and Middle Devonian	Catskill formation	5,500	Gray sandstone, dark-gray fine-grained sandstone, red sandstone, red, green, and gray shale.	Most productive bedrock formation. Wells have average yield of 20 gpm from sandstone, 15 gpm from so-called bluestone, 14 gpm from shale. Wells average 135 feet in depth. Water generally soft or only moderately hard.
	Middle Devonian	Ashokan formation	250 to 350	Gray arkosic laminated sandstone alternating with olive-green, rusty-weathering shale.	Yields small supplies to wells chiefly from fractures and openings along bedding planes. Wells average 135 feet in depth; 7 gpm in yield. The single analysis recorded shows hard water low in iron.
		Mount Marion formation	700 to 1,100	Gray, brown-weathering sandstone and dark-gray shale with marine fossils.	Yields small supplies to drilled wells, which average 210 feet in depth. Yield consistently low, averaging 3 gpm; several dry holes reported. Water soft, but the one recorded analysis indicates high iron concentration.
		Bakoven shale	140 to 200	Black to dark-gray fissile shale with brown streaks; contains pyrite.	No wells reported to obtain water from this formation.
	Middle or Lower Devonian	Onondaga limestone	80±	Massive light- to blue-gray crystalline limestone with seams of chert. Locally has fossil corals.	Yields small to moderate supplies to drilled wells that encounter joints and bedding planes enlarged by solution. Average yield 8 gpm. Springs common. Water may be contaminated locally because of lack of natural filtration in subterranean streams.
		Schoharie grit	80±	Shaly limestone; contains seams of chert.	Acts as hydrologic unit with Onondaga; see above.
		Esopus siltstone	250	Drab to brown massive siltstone; fracture cleavage well developed; few fossils.	Yields small to moderate supplies to drilled wells. These have average depth of 120 feet. Water occurs in openings along cleavage planes; average yield of 10 gpm and static levels are relatively deep at most places.
	Lower Devonian	Glenerie limestone (of Chadwick, 1908)	6 to 20	Impure siliceous limestone; contains seams of chert; dark gray when fresh and weathers buff or red. Fossiliferous.	Same as Esopus siltstone with which it is believed to act as a hydrologic unit.
		Helderberg group	300±	Shaly limestone, cherty limestone, and massive crystalline limestone. Highly fossiliferous.	Yields small to moderate supplies to drilled wells. These average 125 feet in depth and range in yield from 1 to 30 gpm. Average yield is 7 gpm. Water commonly hard but hardness chiefly of carbonate type.
Silurian	Upper Silurian	Rondout and Manlius limestones	50 to 80	Massive dark-gray, light-weathering limestone; some shaly and sandy limestone. Fossiliferous.	
Ordovician	Middle Ordovician	* Normanskill shale	1,000±	Gray sandstone, with chert and dark-gray shale.	Yields small supplies of water to drilled wells, which average 148 feet in depth. Average yield about 6 gpm. Water commonly hard, chiefly carbonate hardness. Iron concentration locally excessive.
	Lower Ordovician	Deepkill shale	200±	Green siliceous shale, black shale, and thin-bedded limestone and chert.	Yields small to moderate supplies to drilled wells. Yield and depth of wells range widely; average yield about 10 gpm. Water exceedingly hard. Noncarbonate hardness relatively high; iron concentration locally exceeds limit of 0.3 ppm recommended by U. S. Public Health Service.

3 of 18

continental origin. These formations have been distorted very little but are traversed by joints. Ground water occurs partly in joints and openings along bedding planes and partly in pores. The coarser grained parts of the Catskill formation have the largest yields of all the bedrock.

In following paragraphs, the detailed information is given on lithology, water-bearing properties, and yields of the 7 water-bearing units that are consolidated rocks.

Deepkill and Normanskill shales.—The Deepkill and Normanskill shales underlie an area 1 to 3 miles wide in the extreme eastern part of Greene County. The two formations are mapped together on plate 2; most of the outcrop shown is that of the Normanskill shale, which actually underlies sand and clay of Pleistocene age but forms some low, rounded hills. The Deepkill shale is largely covered by the Normanskill and crops out chiefly in a narrow band about 4 miles long adjacent to the Hudson River near Coxsackie. About 70 wells for which there are records are situated on the outcrop of the Normanskill, and about 20 of these are reported to pass through the overlying Normanskill shale and penetrate the underlying Deepkill shale. Of these wells, records for 14 are given in table 6.

The Deepkill shale consists mainly of green siliceous shale, sandy shale, black graptolite-bearing shale, and some thin beds of limestone and chert. The thickness at Stuyvesant, in Columbia County across the Hudson River, is at least 200 feet (Goldring, 1943, p. 98), but the thickness in Greene County is not known. The water-bearing properties of the Deepkill are probably similar to those of the shale beds of the Normanskill, but few data are available. About 20 wells pass through the Normanskill and encounter limestone that is considered to be the Deepkill. Most of these wells are in Athens and Coxsackie Townships and in the southern part of Catskill Township near Alsen and Cementon. These wells range in depth from 65 to 600 feet. The range in yield of 17 wells is from 0.5 gallon per minute to 32 gallons per minute (gpm) and the average yield is 10 gpm.

Chemical analyses have been made of water samples from four wells believed to produce water from the limestone of the Deepkill shale (table 4). The hardness of this water expressed as calcium carbonate ranges from 290 to 510 parts per million (ppm). The noncarbonate ("permanent") hardness is higher than for most of the other aquifers, ranging from 51 to 305 ppm. The iron concentration in water from two of the four wells sampled exceeds 0.3 ppm.

The Normanskill in this area is composed chiefly of gray arkosic sandstone with some chert and dark-gray to black shale. The chert is black, red, or green nodules that weather white. The rocks of this formation are dense and practically impervious. Many of the beds of sandstone are so well cemented that when fractured they break across the quartz grains. The Normanskill is about 1,000 feet thick.

The entire formation is greatly folded and faulted. The beds of shale are distorted into intricate closed folds, whereas the more competent beds of sandstone and chert form open folds. These competent beds, however, being brittle, are also broken by numerous fractures, or joints. The ground water produced from the Normanskill is in these joints.

The yields of 53 wells in this formation average 6 gpm and range from less than ½ to 28 gpm. Because of the erratic distribution of the beds containing joints it is difficult to predict the success or failure of a well. For example, of two wells drilled on the same property, one may yield an ample supply, the other none or an inadequate supply. However, rarely is a well drilled without obtaining some water. Available records of wells in the County show one dry hole in the Normanskill shale. The depth of wells in the Normanskill averages 148 feet and ranges from 40 to 360 feet. The fractures in the Normanskill diminish in size and pinch out within a depth of about 200 feet. Few wells obtain appreciable additional water below that depth.

The average static water level in 23 wells ending in the Normanskill is about 20 feet with a range from 1 to 125 feet.

Water from the Normanskill shale is high in mineral content, as shown by four available analyses (table 4). The dissolved solids in two of the analyses exceeds 1,000 ppm, and the range is from 459 to 1,120 ppm. The hardness ranges from 100 to 330 ppm and the bicarbonate content from 278 to 522 ppm. The absence of noncarbonate hardness is noted in three of the four analyses and also in five analyses of water from the Normanskill in adjacent Columbia and Rensselaer Counties. Iron concentration exceeds 0.3 ppm at several places, both in Greene County and in adjacent counties.

Rondout and Manlius limestones and Helderberg group.—The sequence of limestones from the Rondout limestone through the Helderberg group (of which the uppermost formation is the Port Ewen limestone) underlies a narrow belt, less than 1 mile wide, which extends from the northern to the southern boundaries of the County. These limestones are shown on plate 2 as one unit adjoining the Deepkill and Normanskill unit on the west and may be approximately located on plate 1 by a line passing through the towns of Cementon and Climax. The limestones have been considerably folded and faulted locally, the intensity of the deformation increasing from north to south. The more massive beds form cliffs, so that topographically the belt is marked by an almost continuous escarpment about 100 feet high rising above the Hudson Valley, backed by short, steep parallel ridges.

The Rondout limestone of Late Silurian age ranges from 10 feet of drab waterlime in the northern part of the County to 30 feet of sandy and reefy beds in the southern part. At many places it is concealed beneath talus from the overlying Manlius limestone, also of Late Silurian age. The Manlius limestone is a dark fine-grained laminated limestone which weathers light gray. The Manlius forms cliffs together with overlying Coeymans limestone. The thickness of the Manlius limestone in Greene County ranges from 40 to 50 feet. The Manlius is consistently hard and, therefore, forms cliffs even though it is thin bedded.

The Helderberg group of Devonian age consists of approximately 300 feet of highly fossiliferous crinoidal, cherty, and shaly limestone which is divided into six formations, the Coeymans, Kalkberg, New Scotland, Becraft, Alsen and Port Ewen limestones, in ascending order. The Port Ewen is here included in the Helderberg group in conformity with the Devonian correlation chart (Cooper and others, 1942) and on the basis of faunal evidence. Lithologically the Coeymans and Becraft are fairly pure limestones composed in large part of crinoid debris and fragments of other fossils, the Kalkberg and Alsen are cherty limestones, and the New Scotland and Port Ewen are very impure shaly limestones. The Coeymans, together with the underlying Manlius, and the Becraft have been extensively quarried for lime throughout the County, and large quarries are active at the present time in the area south of Catskill.

The Rondout and Manlius limestones, and the Helderberg group are here considered to act together as a hydrologic unit in the storage and transmission of ground water. Because of the complex folding and faulting, they usually cannot be distinguished from each other in drillers' logs. Water is contained in joints which are commonly widened by solution in the massive beds, in fracture cleavage in the shaly beds and in openings along faults and bedding planes. Springs are common in these limestones and their number is related to the intensity of deformation of the rocks. The beds are more strongly deformed and the number of joints increases from north to south. Correspondingly, the number of springs is greater and yields

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Clay and silt.—In general, clay and silt are not water bearing. In Greene County, clay and silt occur widely in small strata or lenses interbedded with sand and gravel or with deposits of till. However, there are five extensive bodies of the stratified drift that are composed chiefly of clay or clay and silt. The material of these bodies is the finer grained rock material that was washed into and deposited in the quiet waters of glacial lakes presumably impounded behind dams of ice or of till. These five bodies are along the Hudson River, and at one place each in the valleys of Schoharie Creek, Batavia Kill, Catskill Creek, and Kaaterskill Creek. They are not distinguished from the other deposits of stratified drift on plate 3.

The largest body of clay and silt underlies the terrace along the Hudson River. It extends almost continuously along the river throughout the length of the County, and is as much as four miles wide between Athens and Coxsackie. The clay and silt were deposited in thin, even, essentially horizontal laminations. The deposits once underlay and formed a continuous, nearly level plain. At present, from Catskill south to the County line, this plain has been fairly well dissected, but between Athens and Coxsackie extensive flats remain. Athens Flat, along the West Shore line of the New York Central and east of U. S. Highway 9W, is perhaps the largest.

Well logs show that the underlying bedrock surface is comparatively irregular. From Catskill south there is no particular pattern to the irregularities, but west of Coxsackie a series of wells along Route 9W suggest the presence of a buried bedrock channel whose bottom is generally more than 100 feet deep, and has a maximum depth of at least 165 feet. This deep trench was carved out of the Deepkill and Normanskill shales, and it seems to lie parallel to and close to the base of the Kalkberg. It begins at Flint Mine Hill and apparently continues northward beneath Route 9W, and extends beyond the County. Unfortunately the unconsolidated deposits that fill this depression are chiefly clay and silt, which produce relatively little water (see logs of wells G 417, G 418, G448, and G 451 in table 5). However, thin beds of sand and gravel apparently intervene, at least locally, between the fine-grained deposits and the bedrock. For example, wells G 418 and G 451 are reported to obtain yields of 20 to 30 gpm from beds of sand and gravel.

A second, narrow but fairly long body of clay and silt occurs in the valley of Kaaterskill Creek in the northeastward-trending portion of its lower course east of the Hoogeberg. Where Kaaterskill Creek turns abruptly eastward, the body of fine-grained deposits continues northward following the depression east of Vedder Hill, and extends to the valley of Catskill Creek at Leeds. This body seems to occupy the lower portion of an old valley of Kaaterskill Creek (now abandoned in the northern reach adjacent to Vedder Hill). Few wells are known to penetrate these deposits, but well G 552, near Leeds, passed through 144 feet of unconsolidated deposits, of which the lower 129 feet is clay, before reaching bedrock.

A small body of fine-grained deposits lies in the valley of Catskill Creek at Oak Hill in the extreme northern part of the County. Well G 228 is 74 feet deep and failed to encounter bedrock. The material penetrated by this well, and others in the vicinity not shown on the map, is at least 70 feet thick, and composed, at least in substantial part, of clay.

The lower reach of the valley of Batavia Kill, from its junction with Schoharie Creek upstream to Red Falls, also contains considerable fine-grained fill.

Finally, an extensive body of unconsolidated deposits occurs along the valley of Schoharie Creek from Prattsville to Lexington, a distance of about 8 miles. A large, if not predominant, part of these deposits is fine-grained material. (See, for example, log of well G 30, table 5.)

Particles of clay and silt are extremely small; thus, pore spaces, although numerous, are

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small. Many fine-grained deposits contain considerable water in storage, but do not transmit water readily. Conversely, the clays locally constitute confining beds retaining water under artesian pressure. The clays here described in Greene County are less permeable than the till. Of the more than 600 wells visited in Greene County none obtain water from the clay and silt.

Sand and gravel.—In Greene County, stratified deposits consisting mainly of sand and gravel occur along the stream valleys (pl. 3). The thickest known bodies are in the valleys of Vly Creek and West Kill. Gravel, interbedded with clay and till, occurs in the valleys of Schoharie Creek and Batavia Kill, and in the upper part of the valley of Catskill Creek. Deposits of sand and gravel are present in the valley of Potic Creek, beneath the Sandy Plain and Leeds Flat areas in the Catskill Creek valley, in the glacial delta of Catskill Creek at Jefferson Heights and West Catskill, and beneath the Kiskatom Flats along Kaaterskill Creek. Recent alluvium occurs in many creek bottoms and in islands in the Hudson River. It is composed chiefly of fine sand and is of small extent and thickness.

Sand and gravel were deposited (1) as deltas at the margins of glacial lakes and (2) as outwash laid down chiefly by and in melt-water streams flowing away from the ice. The deltaic deposits thus occupy certain specific areas of relatively small extent. These deposits are relatively well sorted, and the pore spaces are open, resulting in a fairly high permeability. The grain sizes usually are progressively coarser in the direction of the delta heads. At the outer margin of the deltas the deposits grade into or overlie or interfinger with beds of clay and silt. Outwash deposits differ in lithologic characteristics because of differences in the velocity, volume, and load of the depositing streams, or differences in other conditions of deposition. The outwash deposits, as here considered, are either kames and kame terraces (Flint, 1947, p. 146-7) situated along the valley sides, or valley-train deposits that occupy the valley floors (Flint, 1947, p. 135). The kame and kame-terrace deposits are poorly sorted and irregularly stratified sand and gravel, as they were formed over and along the margins of stagnant ice that subsequently melted. In contrast, the valley-train deposits are well sorted. Because depositional conditions were varied and relatively complex, the character and consequently the permeability of the outwash deposits differ within relatively short distances, causing in some cases abrupt changes from coarse to fine materials. In addition, outwash deposits are known to occur locally overlain or underlain by till. In some places there is no sharp dividing line between the materials.

The deposits of sand and gravel generally are highly permeable. Hence, the deposits of sand and gravel are tapped by only a few wells. Furthermore, the relatively few records available show that only small yields have been obtained, and also that the wells are unscreened and not developed. The average yield of 26 wells reported ending in gravel is 29 gpm and of seven wells reported ending in sand is 16 gpm. The maximum water-yielding capacity of these deposits in Greene County is not known. From the records of wells, it is found that the drilled wells that tap them all draw water directly through the open bottom of the casing which is in the water-bearing bed. A proper screen would provide a much larger intake area which would increase the yield many times.

Numerous records show that wells have been cased through thick deposits of sand and gravel to end scores of feet lower in dense bedrock, which yielded but a few gallons a minute. This is unfortunate because the sand and gravel, at most places, are capable of yielding substantial quantities of water to properly constructed and developed wells. In areas where the deposits are favorably located for recharge from nearby streams, relatively large withdrawals of water can be sustained for long periods of time without excessive lowering of water levels.

The five available analyses of water for Pleistocene gravel (table 4) indicate that most mineral constituents are in small enough quantities that the water is satisfactory for general

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deposits also occur in the upper part of the Batavia Kill valley, but most of these are also above the water table.

In the valley of Huntersfield Creek, well G 7 passes through 230 feet of unconsolidated material logged as sand, clay, and gravel, and reportedly yields 40 gpm. This well is near the front of a delta, and other wells put down in this delta probably would have good yields also.

In the eastern and northeastern parts of Greene County east of the Catskill Mountains, where ice was much thicker, the ice probably covered the lowlands at the time the glacier was melting from the Catskill Mountains. In the town of Durham, small bodies of sand and gravel were deposited between the flanks of the mountains and glacial ice. Subsequently these deposits were buried beneath till, perhaps by a readvance of the glacier. For example, the log of well G 248 shows 35 feet of gravel overlain by 80 feet of till. In the area from Catskill Creek north along Potic Creek to the Newrys-Medway road, including the Cob Creek watershed, deposits of poorly sorted sand and gravel form kames and other features associated with a stagnating ice sheet. Most of these deposits are less than 20 feet thick (pl. 1), and they lie on a fairly smooth bedrock surface. From the vicinity of Cairo to Leeds, Catskill Creek flows across broad plains known as Sandy Plain and Leeds Flats. The only drilled well in this area, G 295 on Sandy Plain, obtains water from the bedrock, but the log shows 30 feet of sand and gravel. Driven wells, such as G 277 and G 294, in the same general area, obtain small supplies from sandy deposits. Accordingly, fairly good supplies of water probably could be developed in these plains, especially in the upstream portions near South Cairo.

Where the deposits are predominantly sandy and the water table shallow, drive points make satisfactory and economical wells. These are constructed by driving down a string of pipe, commonly 1¼ inches to 2 inches in diameter, with a screened drive point at the bottom. Such wells may be driven by a maul or by alternately raising and dropping a heavy weight suspended by a tripod. The depth to which such wells may be driven is limited by the resistance of the material, the friction on the pipe, and the chance occurrence of large boulders. Under favorable conditions 2-inch wells can be driven 100 feet or more in sand and fine gravel. Although the yield of individual wells is generally not great, they may be useful for small domestic and stock use, for testing shallow aquifers, and for the development of temporary water supplies. Where the water level is shallow, larger supplies can be obtained from gangs of drive points connected to a common pump.

In the valley of Kaaterskill Creek, extensive areas appear to be underlain by unconsolidated deposits. The largest of these is the Kiskatom Flats, west of Vedder Hill (pl. 1). No known wells actually tap these deposits, but several wells drilled into the bedrock of which G 524 is one, reportedly pass through gravel above the bedrock. If this gravel is thick and extensive, the area could doubtless produce large ground-water supplies.

A large delta lies along Catskill Creek east of Jefferson Heights. This delta has been divided into two parts by Catskill Creek, and the northern part extends several miles up the valley of Hans Vosen Kill. The material composing this delta is mostly sand and gravel that rests on older lake clays. No records of wells in these deposits are in hand, but where saturated with water, they might yield substantial quantities to properly constructed wells. *

FLUCTUATIONS OF WATER LEVELS

Ground-water levels fluctuate as a result of withdrawals by wells and variations in natural factors—precipitation, evapotranspiration, and runoff. Local precipitation is the source of nearly all ground water in Greene County. However, only part of the rain and snow that falls

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Domestic and Farm Supplies

Ground water is the principal source of water supply for 1,606 farms in Greene County (Department of Commerce, 1950), for rural homes, and for smaller villages. Approximately half the population resides in areas not served by a municipal system and obtains water supplies almost exclusively from wells and springs. About 74 percent of the individual springs and wells listed in tables 3 and 6 are used for domestic or farm purposes. The domestic uses of water include drinking, cooking, washing, and sanitation; these needs are adequately supplied by wells of small yield. Water for cattle and other farm animals is similarly obtained, although commonly a farm has a well for domestic purposes and one or more springs for stock. Dairying is an important part of the County economy. There are many orchards in the Hudson Valley and it is reported that some ground water is used for spraying the trees. The average daily consumption from domestic or farm wells and springs is generally less than 500 gallons.

Industrial and Commercial Supplies

Inasmuch as Greene County is not heavily industrialized, water is not extensively used for industrial purposes. Manufacturing establishments are located principally at Catskill, Athens, Coxsackie, and West Coxsackie, their development favored by location on the Hudson River and later by the building of the West Shore Line of the New York Central Railroad. Most of these establishments obtain water from the towns named, all of which have surface-water supplies. Considerable ground water is used by cement companies and other quarrying concerns in the County. Three of the largest quarries are in the limestone hills near Alsen and Cementon. Both towns are supported entirely by the cement industry. At Cementon, the source of supply is a spring-fed reservoir half a mile west of the plant. Some water is delivered to employees of the company for domestic purposes, but about 80 percent of the total daily pumpage of several thousand gallons is for quarrying.

Greene County contains a sizable and attractive part of the Catskill Mountains, and catering to the tourist trade is one of the largest means of livelihood in the County. The principal resort district is in the eastern part of the Catskill Mountains in such towns as Maple Crest in the valley of Batavia Kill; and Haines Falls, Tannersville, and Hunter in the valley of Schoharie Creek. Other resorts are at Palenville at the foot of the mountains, and near East Durham and Greenville north of the mountains. Although not all the resort wells were visited, it is believed that records were obtained for wells at most of the larger resorts. Of the 54 wells whose use is classed as commercial, 50 serve hotels, boarding houses, and tourist houses that cater chiefly to summer visitors. Total consumption at 35 of these resorts is estimated at 130,000 gallons per day in July and August. This figure does not include water for the seven known swimming pools. Three of these pools have a combined capacity exceeding 350,000 gallons. It is not known how often they are filled. Because the requirements may be large even though of short duration, some establishments have as many as five or six drilled wells and large storage facilities, and yet are short of water. Peak tourist and vacation demands occur at a time when water losses from evaporation and transpiration are at their maximum, and when ground-water recharge is low.

Public Supplies

Of the 10 public water systems in Greene County, four use ground water wholly or in part. However, all of these are in small communities. There are about 35 unincorporated settlements in the County that do not have any public water system.

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Catskill.—The water for the town of Catskill (population 5,392) is obtained entirely from surface-water sources. Water is taken from the West Branch of Potic Creek which has a drainage area of about 14½ square miles above the dam two miles south of Earlton. The reservoir, in use since 1930, has a storage capacity of 220 million gallons, about a 7-month supply. Another reservoir having a capacity of four million gallons may be used as an auxiliary source if needed. Water treatment includes the use of alum as a coagulant, aeration, filtration, and chlorination. The daily consumption averages about 900,000 gallons. Residents of Leeds and Jefferson also are served by the Catskill system. In the summer, the maximum population served is about 8,000.

Coxsackie.—Coxsackie (population 2,722) is supplied from a reservoir on a tributary to Coxsackie Creek situated northwest of the village at Roberts Hill. Water is distributed from the reservoir by gravity. The maximum daily consumption is about 450,000 gallons, and the average daily consumption is about 300,000 gallons. About 20 percent is used by industries.

Athens.—Athens (population 1,545) obtains water from Hollister Lake, 5½ miles northwest of the village. Water is pumped to a concrete reservoir near the village from which it is distributed by gravity. The maximum daily consumption is about 300,000 gallons, and the average is about 175,00 gallons. About 20 percent is used by industries.

Cairo.—Cairo (population 800) is supplied by several springs and a brook two miles northwest of the village, which together feed two reservoirs of 11 million gallons capacity each. Distribution is by gravity. A well near the reservoir is pumped in dry seasons at the rate of about 15 gpm. The daily consumption averages about 60,000 gallons. In the summer the maximum population served is reported to be about 6,000.

Tannersville.—Tannersville (population 639) is supplied from a small brook, Schoharie Creek being an auxiliary source. Tannersville is primarily a summer resort, and the use of water is greatest in summer. Approximately 400,000 gallons per day is pumped during June, July, and August. The average daily pumpage in the remainder of the year is about 70,000 gallons.

Prattsville.—Prattsville (population 600) is supplied by an impounding reservoir on Huntersfield Creek northeast of the village from which water flows into a concrete collecting basin having a capacity of 40,000 gallons. Treatment consists of chlorination, and distribution is by gravity. An auxiliary source of supply is a drilled well 408 feet deep which is reported to yield 500 gpm. Daily consumption is believed not to exceed 80,000 gallons.

Hunter.—Hunter (population 526) obtains water from a small brook near the village. Consumption averages about 50,000 gallons per day.

Windham.—At Windham (population 600) a spring supplies about 105 families and a hotel. The system includes three reservoirs. Distribution is by gravity at most times, but in dry weather water is pumped from an auxiliary spring. The average daily consumption is believed to be about 35,000 gallons.

Hensonville.—Hensonville (population 250) is supplied by a group of five springs half a mile east of town. Water is collected in a small storage reservoir and distributed by gravity. Daily consumption is reported to be about 10,000 gallons.

Alsen.—Alsen has no public system serving the whole community, but about 150 persons are supplied from a well owned by a cement company (G 507). Water from this well is chlorinated, then pumped to an elevated wooden tank and distributed by gravity. The daily consumption is reported to be about 5,000 gallons.

Table 6.—records of selected wells in Greene County, New York (Continued)

Well number	Location	Owner	Altitude above sea level (feet)	Type of well	Depth (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic subdivision	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
G 410	12X, 12.1N, 8.8E	C. C. Hallock	380	Drl	80	6	6	Helderberg group	20	Jet	4	Dom	Yield 4 gpm at 60 feet with no increase at 80 feet. [b]
G 412	12X, 9.0N, 9.8E	John Himmer	100	Drl	165	6	16	Normanskill shale	18	Force	9	Dom	
G 413	12X, 14.0N, 9.1E	T. Haney	300	Dug	24	48	..	Pleistocene gravel	18	Pitcher	..	Dom	(a).
G 415	12X, 12.7N, 7.0E	A. Harden	525	Drl	200	6	110	..	..	None	1/10	None	Well abandoned.
G 417	12X, 5.7N, 7.7E	G. W. Bergmann	125	Drl	150	6	140	Normanskill shale	..	..	20	Farm	Well reported to flow at rate of 5 gpm. [b]
G 418	12X, 6.8N, 8.0E	Leo Vermann	110	Drl	160	6	..	Pleistocene gravel	..	..	30	Dom	Well flows. [b]
G 420	12X, 5.4N, 8.7E	R. Sutton	180	Drl	333	6	16	Deepkill shale	4	..	½	None	Yield ½ gpm at 90 feet, no increase at 3.13 feet. [b]
G 423	12X, 4.5N, 8.8E	E. Schubert	160	Dug	10	38	..	Pleistocene till	1.30	Pitcher	..	Farm	(a).
G 424	12X, 5.4N, 9.3E	E. Swartout	240	Drl	115	6	5	Normanskill shale	10	Jet	3	Farm	Main water bed at 96 to 112 feet.
G 425	12X, 5.2N, 9.4E	A. Browor	240	Drl	127	6	6	do.	6	Suction	10	Dom	
G 427	12X, 7.0N, 8.4E	L. Reyngoudt	120	Drl	130	6	120	do.	..	..	6	Dom	Well flows.
G 428	12X, 6.8N, 7.0E	R. Wilkinson	320	Drl	228	6	8	Helderberg group	3	Suction	1	Farm	Yield 1 gpm at 22 feet, no increase at 228 feet. [b]
G 432	12X, 7.6N, 6.0E	John Moritz	400	Drl	183	6	41	Mount Marion formation	7	..	10	Dom	Well flowed when drilled.
G 437	12X, 9.1N, 6.8E	R. Bauer	560	Drl	110	6	43	do.	20	Jet	12	Dom	Yield 4 gpm at 70 feet.
G 439	12X, 7.5N, 6.8E	John Svejda	400	Drl	104	6	21	Onondaga limestone	..	..	8	Dom	Well flows seasonally.
G 439	12X, 7.7N, 7.0E	Lansing Vedder	355	Drl	170	6	103	Onondaga limestone and Schoharie grit	..	None	..	Dom	(b).
G 442	12X, 8.7N, 3.5E	K. Ciccone	520	Drl	60	6	16	Ashokan formation	30	Jet	5	Dom	(b).
G 444	12X, 7.8N, 9.4E	Knaust Bros.	140	Drl	600	6	20	Deepkill shale	25	..	10	Ind	Well flowed when drilled. [b]
G 445	12X, 7.0N, 6.8E	Knaust Bros.	300	Drl	91	6	20	Onondaga limestone	20	Force	8	Dom	(b).
G 447	12X, 4.3N, 8.7E	J. Bush	180	Drl	500	6	11	Deepkill shale	40	None	¼	None	Yield ¼ gpm at 70 to 100 feet.
G 448	12X, 6.0N, 7.8E	State Vocational Training School	130	Drl	123	10	..	Pleistocene gravel	..	do.	..	None	Well flows. [b]
G 451	12X, 6.6N, 7.0E	John Reis	120	Drl	160	6	..	do.	2	..	20	Com	Well abandoned. [b]
G 452	12X, 8.8N, 8.8E	H. Bell	120	Drl	110	6	102	Deepkill shale	16	Force	2	Com	Yield 7½ gpm at 88 feet but quicksand reduced yield to 2 gpm.
G 456	12X, 4.1N, 10.5E	C. Beck	60	Drl	354	6	125	Normanskill shale	125	do.	1	Dom	Yield 1 gpm at 125 feet, no increase at 354 feet. [a]
G 457	12X, 3.6N, 10.5E	Andrew Souchareff	120	Drl	450	6	38	Deepkill shale	26	do.	10	Com	Yield 2½ gpm at 82 feet, 10 gpm at 350 ft.
G 461	12X, 9.1N, 4.7E	R. Stuvens	580	Drl	132	6	28	Ashokan formation	10	Jet	6	Com	Two similar wells at this location.
G 463	12X, 8.3N, 9.7E	Rudolf Losort	140	Drl	180	6	..	Deepkill shale	16	Force	6	Farm	
G 470	12X, 6.2N, 7.8E	William Hass	120	Drl	265	6	165	Normanskill shale	..	Suction	20	Dom	Well flows.
G 471	12X, 0.6S, 8.1E	W. E. Thorpe, Jr.	160	Drl	189	6	187	do.	15	Force	8	Dom	Another well at this location. [b]

See footnotes at end of table.

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Table 6.—records of selected wells in Greene County, New York (Continued)

Well number	Location	Owner	Altitude above sea level (feet)	Type of well	Depth (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic subdivision	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
G 475	12X, 0.6N, 8.5E	H. G. Wagner	110	Drl	400	6	10	Deepkill shale	30	Force	3	Dom	Well flows seasonally.
G 477	12X, 2.8N, 7.6E	Fred Schmidt	160	Drl	75	6	35	Normanskill shale	6	Suction	..	Dom	(a).
G 479	12X, 0.7N, 7.4E	George Deyoe	220	Drl	134	6	6	do.	..	do.	10	Com	No drawdown reported after pumping for 3⅓ hours at 10 gpm.
G 480	12X, 0.9N, 6.7E	George Hadden	220	Drl	100	6	8	do.	18	Jet	4	Farm	
G 481	12X, 0.3N, 6.7E	L. J. Fox	200	Drl	242	6	20	do.	10	Force	3	Farm	Supplies 30 people.
G 482	12X, 0.7N, 6.5E	William Abjohnson	140	Drl	175	6	175	Pleistocene gravel	+14	Suction	..	Dom	Water rose 14 feet above land surface when well was drilled.
G 488	12X, 3.1N, 5.3E	P. J. Cleary	600	Drl	160	6	12	Mount Marion formation	37	None	7	None	Some water reported at 30 feet.
G 489	12X, 3.2N, 5.3E	M. F. McGovern	620	Drl	212	6	14	do.	50	do.	3	None	Some water reported at 8 feet.
G 491	12X, 3.4N, 5.0E	J. McGuire	670	Drl	125	6	5	do.	12	..	3	Dom	Yield 1 gpm at 75 feet.
G 494	12X, 2.6N, 9.3E	Albright Bros.	160	Drl	65	6	24	Deepkill shale	24	None	30	Farm	Drawdown less than 65 feet when pumped for 10 hours at rate of 30 gpm, Water rises to surface but well does not flow. [b]
G 495	12X, 2.0N, 9.3E	M. C. Albright	140	Drl	264	6	32	Normanskill shale	32	..	22	Farm	Yield 5 gpm at 60 feet, 13 gpm at 220 feet. [a]
G 498	12X, 2.5N, 10.3E	H. Mateer	100	Drl	180	6	12	do.	12	Force	4	Dom	Water reported to contain hydrogen sulfide.
G 502	12X, 2.2N, 5.7E	J. A. Deer	260	Drl	39	6	17	Onondaga limestone	17	do.	1	Dom	
G 503	12X, 0.6S, 7.0E	J. Takach	120	Drl	113	6	42	Normanskill shale	44	do.	½	Farm	
G 504	12X, 0.2S, 7.7E	Thomas Mokrzycki	180	Drl	100	6	7	do.	10	do.	2	Dom	
G 506	12X, 7.3S, 4.2E	Alpha Port. Cement Co.	100	Drl	150	6	..	Deepkill shale	..	Turbine	..	Dom	Pumped 24 hours a day. [a]
G 507	12X, 6.5S, 4.3E	Lehigh Cement Co.	110	Drl	190	6	4	do.	20	Force	3½	Dom	Main water bed reported at 150 feet. [a]
G 510	12X, 5.9S, 5.4E	North American Cement Corp.	90	Drl	67	6	41	do.	5	..	15	Dom	Temperature 53°F., September, 1945. [a]
G 511	12X, 5.9S, 4.6E	North American Cement Corp.	80	Drl	74	6	20	do.	8	Jet	6	Dom	Temperature 54°F., September, 1945. [a]
G 512	12X, 5.6S, 4.2E	North American Cement Corp.	120	Drl	104	6	40	Helderberg group	36	do.	10	Dom	Temperature 50°F., September, 1945. [a]
G 519	12X, 7.2S, 2.8E	Louis Bishop	160	Drl	30	6	5	do.	5	..	30	Farm	Flows seasonally. Main water bed reported at 10 to 20 feet.
G 520	12X, 6.6S, 2.7E	Mathias Wager	200	Drl	199	6	2	Onondaga limestone and Esopus siltstone	50	Force	1	Farm	
G 522	12X, 3.2S, 4.1E	Fred Smith	100	Dug	20	36	..	Pleistocene deposits	9	Pitcher	..	Dom	
G 524	12X, 4.1S, 0.8E	Mathew Story Estate	355	Drl	187	6	65	Catskill formation	15	..	40	Dom	Main water bed at 180 to 187 feet. [a]
G 527	12X, 2.0S, 1.5E	H. B. Overbaugh	360	Drl	126	6	20	do.	..	Pitcher	..	Farm	Well flows.
G 530	12X, 2.5S, 3.7E	Andrew Rhein	240	Drl	120	6	3	Mount Marion formation	17	..	4½	Com	Yield 2 gpm at 50 feet. [a]
G 532	12X, 1.5S, 5.3E	A. Bloznelis	40	Drl	210	6	100	Deepkill shale	40	Force	16	Dom	

See footnotes at end of table.

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Table 6.—records of selected wells in Greene County, New York (Continued)

Well number	Location	Owner	Altitude above sea level (feet)	Type of well	Depth (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic subdivision	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
G 535	12X, 3.3S, 1.3E	School District 7	345	Drl	..	6	..	Catskill formation	..	Force	..	Dom	
G 539	12X, 4.9S, 12.5E	Frederick Edwards	480	Drl	77	6	42	do.	17	..	45	Dom	Main water bed at 70 to 77 feet.[b]
G 541	12W, 4.6S, 11.8E	M. A. Poulos	900	Drl	501	6	..	do.	250	None	5½	Dom	Yield 1 gpm at 250 feet.
G 545	12X, 2.0S, 2.5E	A. Wolff	480	Drl	130	6	10	do.	10	..	20	Com	Some water reported at 50 feet. Supplies swimming pool.
G 547	12X, 1.4S, 6.7E	R. W. Kerr	160	Drl	132	6	5	Normanskill shale	10	..	28	Com	Temperature 50°F., September, 1945.[b]
G 548	12W, 4.1S, 11.9E	W. Weche	600	Drl	90	6	10	Catskill formation	30	Force	5	Dom	Main water bed at 80 to 90 feet.
G 550	12X, 7.8S, 4.0E	H. W. Johnson	120	Drl	101	6	85	Normanskill shale	18	Suction	4	Dom	Main water bed at 85 to 100 feet.
G 552	12X, 0.4S, 4.7E	Michael Maxwell	160	Drl	175	6	144	Onondaga limestone	55	Jet	15	Com	Main water bed at 170 to 175 feet.[b]
G 554	12X, 1.2S, 4.7E	Aarno Sehm	200	Drl	185	6	85	Esopus siltstone	110	Force	5	Com	Yield 2 gpm at 100 feet.
G 557	12X, 3.9S, 1.2E	Kiskatom Dairies	320	Drl	100	6	8	Catskill formation	16	..	7	Farm	
G 559	12X, 4.6S, 1.1E	H. E. Jones	340	Drl	110	6	20	Ashokan formation	12	..	9	Dom	
G 560	12X, 3.3S, 1.4E	W. K. Van Hoesen	340	Drl	136	6	16	Catskill formation	18	..	5	Dom	
G 561	12X, 0.6N, 3.2E	Philip Krug	300	Drl	91	6	8	do.	..	..	30	Dom	Main water bed at 88 to 91 feet.
G 563	12X, 0.3N, 9.3E	F. B. Steedman	100	Drl	150	6	12	Normanskill shale	..	Jet	6	Com	Yield 1 gpm at 90 feet.
G 566	12X, 4.5S, 6.5E	J. Somers	60	Drl	190	6	100	do.	30	Force	8	Farm	
G 569	12X, 4.7S, 0.2E	O. Procida	320	Drl	140	6	10	Catskill formation	22	None	8	None	Main water bed at 110 to 140 feet.
G 570	12X, 2.6S, 0.7E	H. Kett	360	Drl	125	5	43	do.	41	Force	20	Farm	No drawdown reported after pumping at 20 gpm.
G 571	12X, 2.7S, 0.7E	J. Katt	360	Drl	70	6	8	do.	12	Suction	18	Dom	
G 574	12W, 5.3S, 12.0E	J. C. Trosino	540	Drl	84	6	..	Pleistocene gravel	30	Force	16	Dom	
G 575	12W, 5.2S, 11.5E	E. Griffin	600	Drl	150	6	27	Catskill formation	30	do.	8	Dom	
G 580	12X, 3.8S, 1.3E	Charles Margiotta	340	Drl	88	6	20	do.	4	..	3	Dom	
G 582	12W, 5.2S, 11.7E	C. L. Du Bois	500	Drl	15	6	42	do.	35	Force	15	Dom	Drawdown reported to be less than 50 feet after pumping at 15 gpm.
G 585	12W, 5.3S, 11.8E	John Glueck	540	Drl	40	6	43	do.	16	do.	5	Dom	
G 587	12W, 5.2S, 11.6E	N. Y. Telephone Co.	560	Drl	131	6	27	do.	27	do.	5	Dom	
G 595	12W, 5.3S, 11.9E	E. Hobart	200	Drl	28	6	6	Mount Marion formation	28	do.	3	Com	Supplies 30 people.
G 597	12X, 1.4S, 6.7E	Porto & Rich	170	Drl	152	6	21	Normanskill shale	22	None	½	None	✓
G 599	12X, 1.0S, 7.2E	Harold Finch	160	Drl	80	6	21	do.	15	..	2	Dom	
G 603	12X, 1.5S, 7.0E	J. E. Bronk	180	Drl	145	6	10	Deepkill shale	12	..	1½	Dom	
G 604	12X, 0.6S, 7.0E	J. Lasher	180	Drl	80	6	27	Normanskill shale	5	..	4	Com	
G 605	12X, 3.5S, 3.9E	Herold Holdridge	280	Drl	77	6	5	Esopus siltstone	12	Suction	..	Farm	(b).

See footnotes at end of table.

13-8/65

Table 6.—records of selected wells in Greene County, New York (Continued)

Well number	Location			Owner	Altitude above sea level (feet)	Type of well	Depth (feet)	Diameter (inches)	Depth to bedrock (feet)	Geologic subdivision	Water level below land surface (feet)	Method of lift	Yield (gallons per minute)	Use	Remarks
G 606	12X,	3.9S,	3.8E	G. Bloom	260	Drl	100	6	8	Esopus siltstone	8	Suction	..	Farm	Drawdown reported to be less than 90 feet when bailed at approximately 15 gpm.
G 608	12X,	6.0S,	2.9E	M. Relyea	180	Dug	28	48	21	Pleistocene till	8	..	..	Dom	
G 609	12X,	6.1S,	3.0E	M. Relyea	180	Drl	128	6	5	Onondaga limestone and Schoharie grit	28	Force	40	Farm	Some water reported at 28 feet.
✱ G 611	12X,	3.3S,	6.5E	H. Everett	110	Drl	120	6	12	Normanskill shale	25	do.	4	Farm	

[a] For chemical analysis see table 4.
[b] For well log see table 5.

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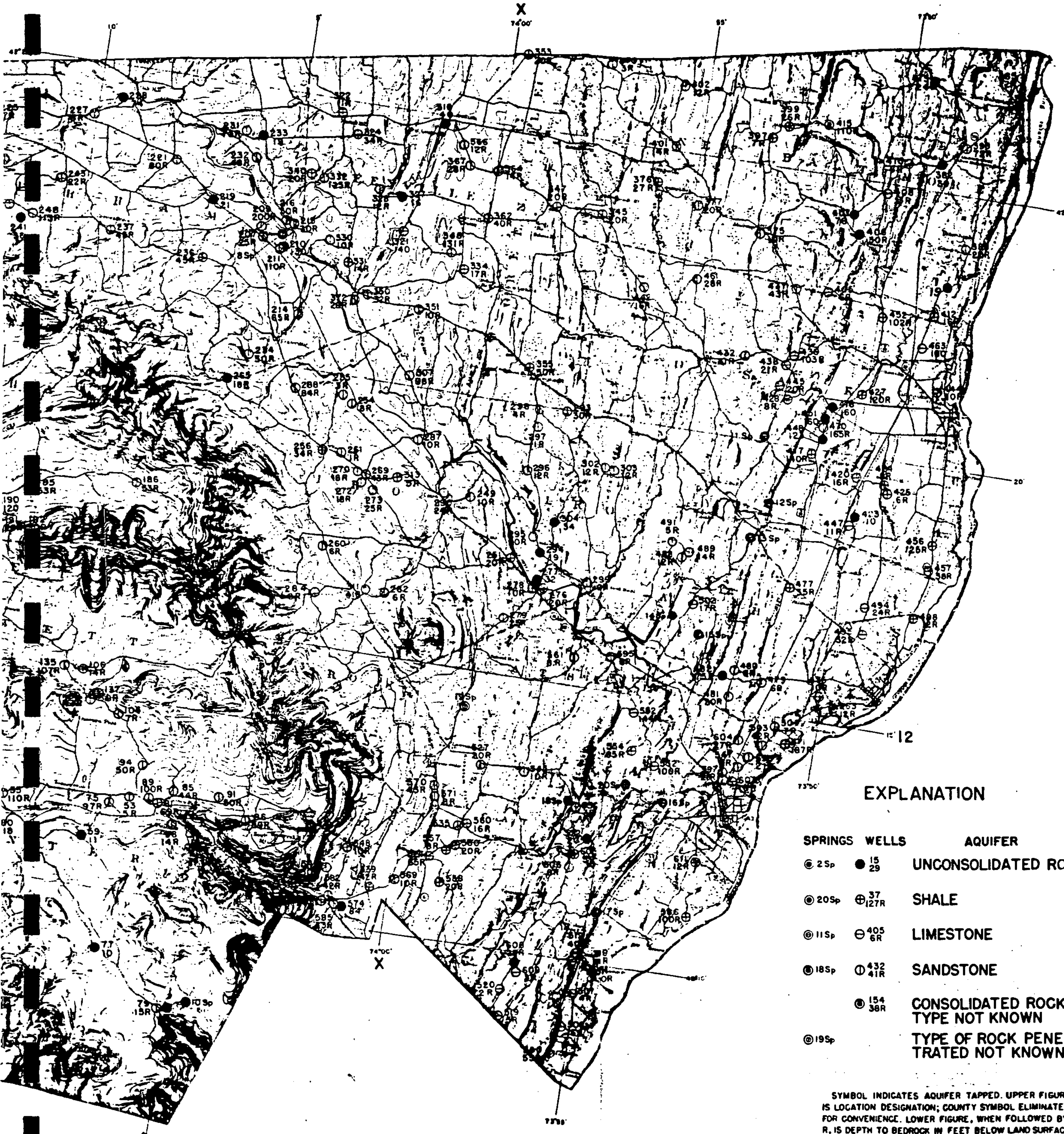
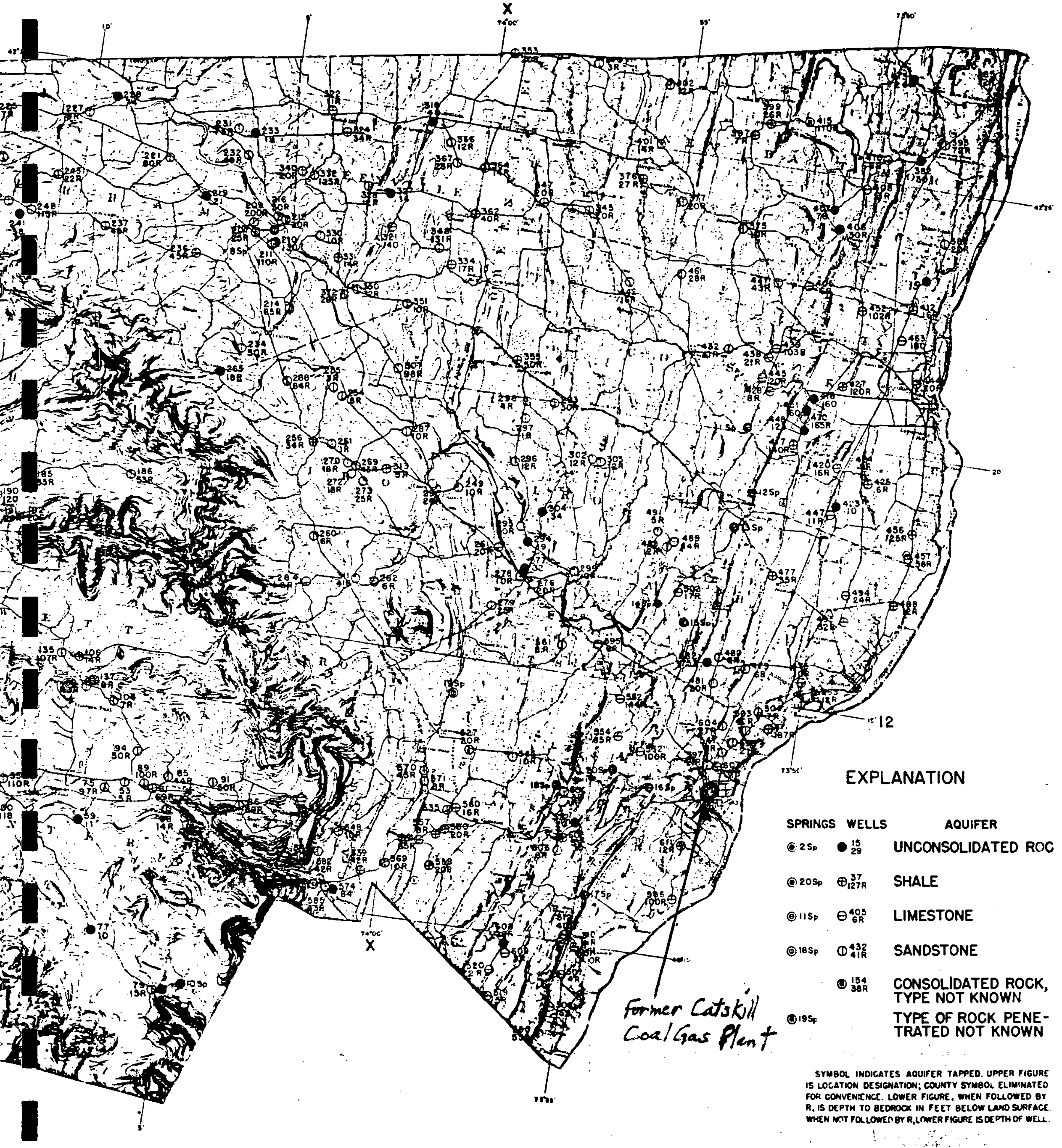


EXPLANATION

SPRINGS	WELLS	AQUIFER
◉ 2Sp	● $^{15}_{29}$	UNCONSOLIDATED ROCK
◉ 20Sp	⊕ $^{37}_{127R}$	SHALE
◉ 11Sp	⊖ $^{405}_{6R}$	LIMESTONE
◉ 18Sp	⦶ $^{432}_{41R}$	SANDSTONE
	◉ $^{154}_{38R}$	CONSOLIDATED ROCK, TYPE NOT KNOWN
◉ 19Sp		TYPE OF ROCK PENETRATED NOT KNOWN

SYMBOL INDICATES AQUIFER TAPPED. UPPER FIGURE IS LOCATION DESIGNATION; COUNTY SYMBOL ELIMINATED FOR CONVENIENCE. LOWER FIGURE, WHEN FOLLOWED BY R, IS DEPTH TO BEDROCK IN FEET BELOW LAND SURFACE. WHEN NOT FOLLOWED BY R, LOWER FIGURE IS DEPTH OF WELL.

16 of 15



Former Catskill Coal Gas Plant

EXPLANATION

SPRINGS	WELLS	AQUIFER
◉ 2Sp	● $\frac{15}{29}$	UNCONSOLIDATED ROC
◉ 20Sp	⊕ $\frac{37}{127R}$	SHALE
◉ 11Sp	⊖ $\frac{405}{6R}$	LIMESTONE
◉ 18Sp	⦶ $\frac{432}{41R}$	SANDSTONE
	◉ $\frac{154}{38R}$	CONSOLIDATED ROCK, TYPE NOT KNOWN
◉ 19Sp		TYPE OF ROCK PENETRATED NOT KNOWN

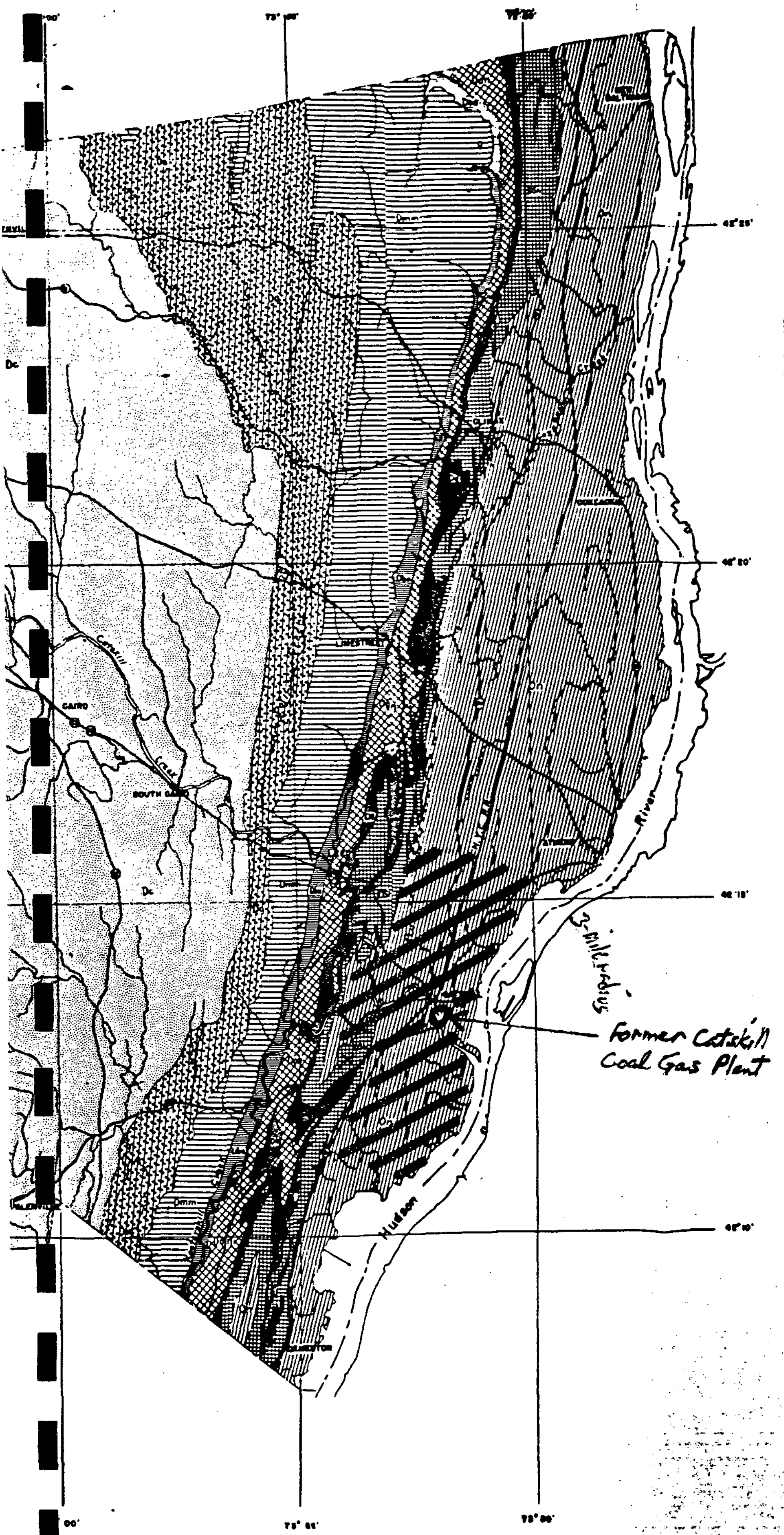
SYMBOL INDICATES AQUIFER TAPPED. UPPER FIGURE IS LOCATION DESIGNATION; COUNTY SYMBOL ELIMINATED FOR CONVENIENCE. LOWER FIGURE, WHEN FOLLOWED BY R, IS DEPTH TO BEDROCK IN FEET BELOW LAND SURFACE. WHEN NOT FOLLOWED BY R, LOWER FIGURE IS DEPTH OF WELL.

17418 Bulletin

Plate 2

COW-34

MAP OF BEDROCK GEOLOGY OF GREENE COUNTY, NEW YORK



EXPLANATION

DEVONIAN

UPPER AND MIDDLE DEVONIAN

Dc — CATSKILL FORMATION

MIDDLE DEVONIAN

Do — ASHOKAN FORMATION

Dmm — MOUNT MARION FORMATION

Dba — BAKOVEN SHALE

Don — ONONDAGA LIMESTONE AND SCHOHARIE GRIT

De — ESOPUS SHALE AND GLENERIE LIMESTONE (OF CHADWICK, 1908)

SILURIAN AND DEVONIAN

Dsh — SILURIAN AND DEVONIAN UNDIFFERENTIATED (INCLUDES PORT EWEN, ALSEN, BECRAFT, NEW SCOTLAND, KALKBERG, AND COEYMANS LIMESTONES OF DEVONIAN AGE, AND MANLIUS AND RONDOUT LIMESTONES OF SILURIAN AGE

ORDOVICIAN

On — NORMANSKILL AND DEEPKILL SHALES

(Hatchures indicate approx. extent of aquifer of concern)

JOINT

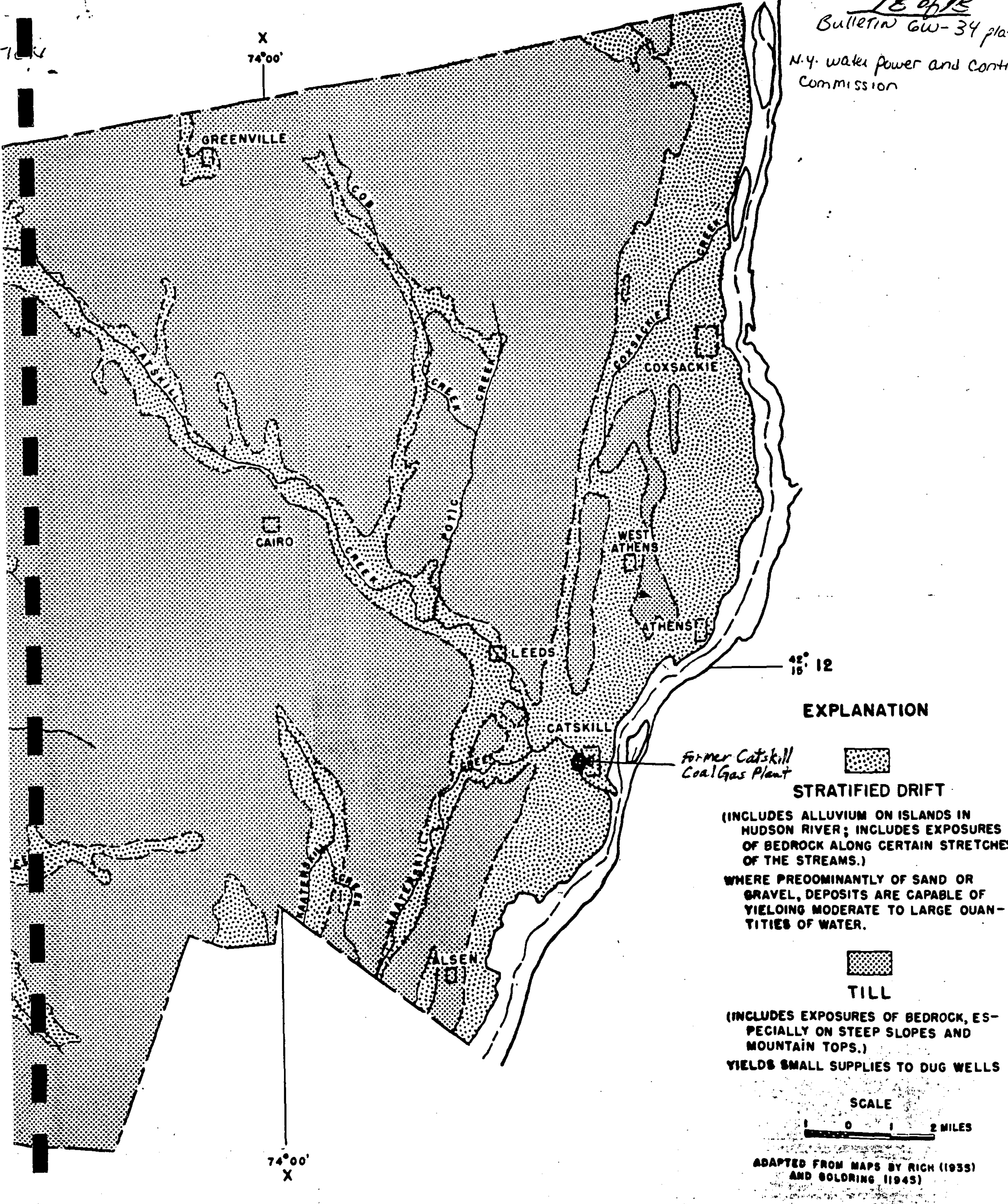
FAULT (NOT SHOWN SOUTH OF 42°15')

SCALE

1 0 1 2 3 4 MILES

GEOLOGY TAKEN FROM MAPS BY WINIFRED GOLDRING, G.H. CHADWICK, AND RUDOLF RUEDEMAN, MODIFIED BY JEAN M. BERDAN.

18 of 18
Bulletin GW-34 plate:
N.Y. Water Power and Control Commission



EXPLANATION

▨ **STRATIFIED DRIFT**

(INCLUDES ALLUVIUM ON ISLANDS IN HUDSON RIVER; INCLUDES EXPOSURES OF BEDROCK ALONG CERTAIN STRETCHES OF THE STREAMS.)

WHERE PREDOMINANTLY OF SAND OR GRAVEL, DEPOSITS ARE CAPABLE OF YIELDING MODERATE TO LARGE QUANTITIES OF WATER.

▨ **TILL**

(INCLUDES EXPOSURES OF BEDROCK, ESPECIALLY ON STEEP SLOPES AND MOUNTAIN TOPS.)

YIELDS SMALL SUPPLIES TO DUG WELLS

ADAPTED FROM MAPS BY RICH (1935) AND GOLDRING (1945)

GREENE COUNTY

Brief Mapping Descriptions for use in Conservation Planning.

APPENDIX 1·3-2

P 1 of 4

Source: Greene Co. Soil and Water Conservation District Office

1B Valois-Nassau complex, 3 to 8 percent slopes

This complex consists of Valois soils and Nassau soils.

Valois Part: Deep, gently sloping, well drained, low lime, gravelly loam soil formed in till. The available water capacity is high. Permeability is moderate.

Nassau Part: Deep gently sloping, somewhat excessively drained low lime gravelly loam soil formed in till that is 10 to 20 inches thick over bedrock. The available water capacity is very low to low. Permeability is moderate.

1CD Valois-Nassau complex, 8 to 25 percent slopes

This complex consists of Valois and Nassau soils.

Valois Part: Deep, sloping to moderately steep, well drianed, low lime, gravelly loam soil formed in till. The available water capacity is high. Permeability is moderate.

Nassau Part: Deep, sloping to moderately steep, somewhat excessively drained, low lime gravelly loam soil formed in till that is 10 to 20 inches thick over bedrock. The available water capacity is very low to low. Permeability is moderate.

* 2B Hudson silt loam, 3 to 8 percent slopes

Deep, gently sloping, moderately well drained, medium or high lime, clayey soil formed in lake-laid deposits. The available water capacity is high. Permeability is slow or very slow.

✓ 2C Hudson silt loam, 8 to 15 percent slopes

Deep, sloping, moderately well drained, medium or high lime, clayey soil formed in lake-laid deposits. The available water capacity is high. Permeability is slow or very slow.

2C3 Hudson silty clay loam, 8 to 15 percent slopes

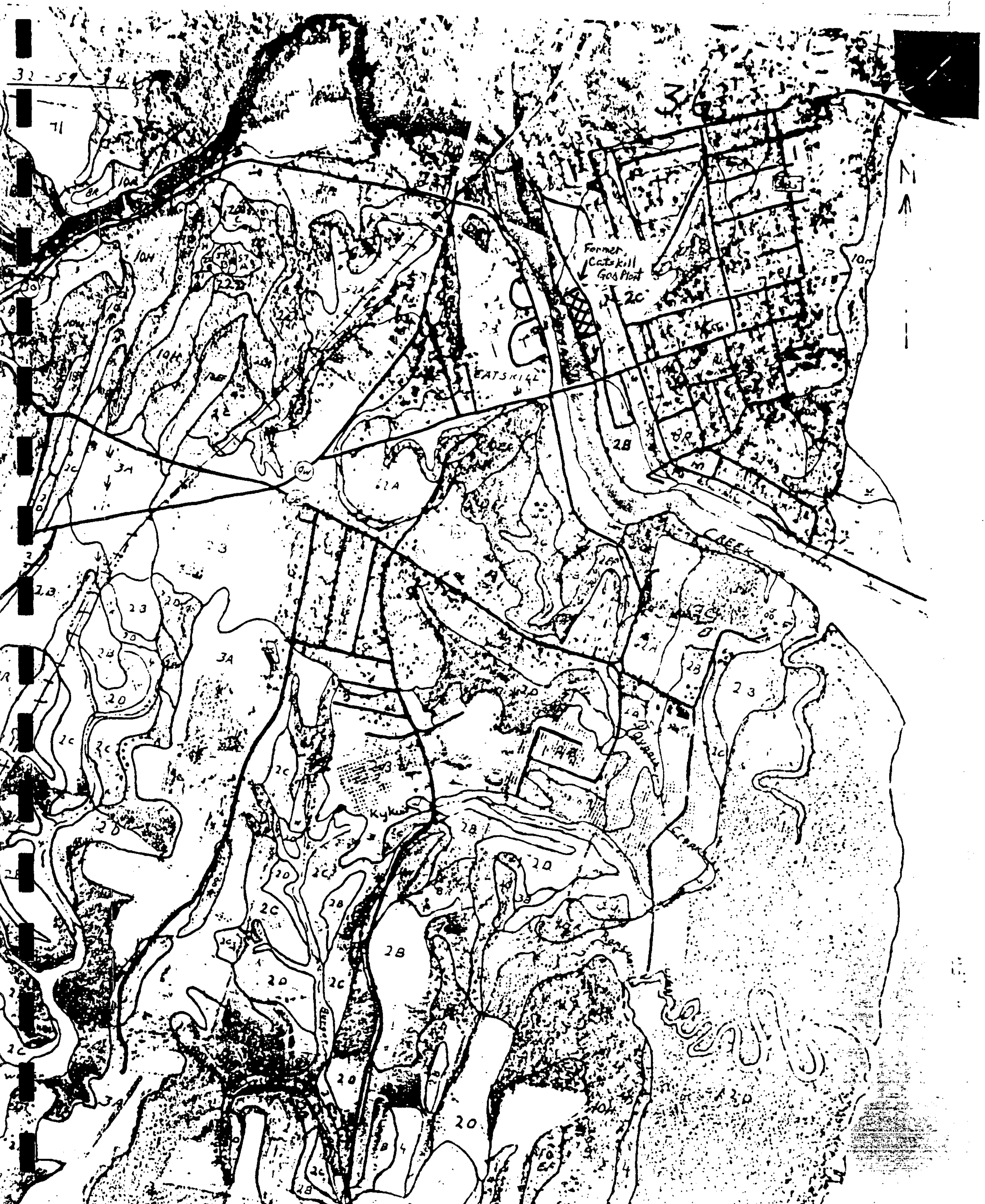
Deep, sloping, somewhat poorly to moderately well drained, medium or high lime, clayey soil formed in lake-laid deposits. The surface layer has been substantially depleted by erosion. The available water capacity is high. Permeability is slow or very slow.

2D3 Hudson silty clay loam, 15 to 25 percent slopes severely eroded

Deep, moderately steep, somewhat poorly to moderately well drained, medium or high

1974/

P 2 OF 4



Former Catskill Gas Plant
CATSKILL
CREEK
9W
N
Kykus
Creek
2A
2B
2C
2D
3A
10H
8R

P 3 of 4

NY0038

SOIL INTERPRETATIONS RECORD

MLRA(S): 101, 160, 142, 144A
REV. HEW, 5-81
GLOSSAQUIC HAPLUDALFS, FINE, ILLITIC, MESIC

HUDSON SERIES

THE HUDSON SERIES CONSISTS OF DEEP, MODERATELY WELL-DRAINED SOILS ON LAKE PLAINS. THEY FORMED IN LAKE LAID SEDIMENTS. TYPICALLY, THESE SOILS HAVE A DARK BROWN SILT LOAM SURFACE LAYER 5 INCHES THICK. A SUBSURFACE LAYER FROM 5 TO 6 INCHES IS BROWN SILT LOAM. THE UPPER PART OF THE SUBSOIL FROM 5 TO 16 INCHES IS YELLOWISH-BROWN SILTY CLAY. THE LOWER PART OF THE SUBSOIL FROM 16 TO 28 INCHES IS MOTTLED BROWN SILTY CLAY. THE CALCAREOUS SUBSTRATUM FROM 28 TO 60 INCHES IS MIXED GRAYISH-BROWN AND LIGHT OLIVE BROWN SILTY CLAY. SLOPES RANGE FROM 0 TO 60 PERCENT.

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.				LIQUID LIMIT	PLAS-TICITY INDEX
					4	10	40	200		
0-6	SIL, SICL, L	ML, CL-ML, OL, CL	A-4, A-6, A-7	0	95-100	95-100	85-100	65-95	25-66	5-19
0-8	GR-SIL, GR-L, CN-SICL	ML, CL-ML, GM, GC	A-6, A-6, A-7	6-10	65-90	60-65	56-85	40-60	26-66	5-19
8-16	SIC, SICL	CL, CH	A-7, A-6	0	95-100	90-100	60-100	80-100	35-66	15-35
16-28	SIC, SICL	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
28-60	SIC, SIL, C	CL, CH	A-7, A-6	0	85-100	90-100	60-100	60-100	35-65	15-35

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEA-BILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS		WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY	
								K	T			STEEL	CONCRETE
0-6	20-40	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	-	MODERATE	.49	3	-	3-6	HIGH	LOW
0-6	20-40	1.20-1.40	0.2-2.0	0.10-0.16	5.1-7.3	-	MODERATE	.37	3	-	3-6		
6-16	35-60	1.16-1.40	<0.2	0.13-0.17	5.1-7.3	-	MODERATE	.28					
16-28	25-60	1.15-1.40	<0.2	0.13-0.17	5.6-7.6	-	MODERATE	.28					
28-60	36-60	1.16-1.40	<0.2	0.12-0.30	6.6-8.4	-	MODERATE	.28					

FLOODING			HIGH WATER TABLE			CEMENTED PAN		BEDROCK		SUBSIDENCE		HYD GRP	POTENT'L FROST ACTION
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. (IN)	TOTAL (IN)		
NONE			1.5-2.0	PERCHED	NOV-APR	-		>60		-		C	HIGH

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-PERCS SLOWLY,WETNESS 15+%: SEVERE-SLOPE,PERCS SLOWLY,WETNESS
SEWAGE LAGOON AREAS	0-2%: SLIGHT 2-7%: MODERATE-SLOPE 7+%: SEVERE-SLOPE
SANITARY LANDFILL (TRENCH)	0-15%: SEVERE-WETNESS,TOO CLAYEY 15+%: SEVERE-SLOPE,TOO CLAYEY,WETNESS
SANITARY LANDFILL (AREA)	0-8%: MODERATE-WETNESS 8-15%: MODERATE-WETNESS,SLOPE 15+%: SEVERE-SLOPE
DAILY COVER FOR LANDFILL	0-15%: POOR-TOO CLAYEY,HARD TO PACK 15+%: POOR-SLOPE,TOO CLAYEY,HARD TO PACK

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	0-15%: SEVERE-WETNESS 15+%: SEVERE-SLOPE,WETNESS
DWELLINGS WITHOUT BASEMENTS	0-8%: MODERATE-WETNESS,SHRINK-SWELL 8-15%: MODERATE-WETNESS,SHRINK-SWELL,SLOPE 15+%: SEVERE-SLOPE
DWELLINGS WITH BASEMENTS	0-15%: SEVERE-WETNESS 15+%: SEVERE-WETNESS,SLOPE
SMALL COMMERCIAL BUILDINGS	0-4%: MODERATE-WETNESS,SHRINK-SWELL 4-8%: MODERATE-WETNESS,SHRINK-SWELL,SLOPE 8+%: SEVERE-SLOPE
LOCAL ROADS AND STREETS	0-15%: SEVERE-FROST ACTION,LOW STRENGTH 15+%: SEVERE-SLOPE,FROST ACTION,LOW STRENGTH
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-6% SIL,SICL,L: MODERATE-WETNESS 8-15% SIL,SICL,L: MODERATE-WETNESS,SLOPE 0-6% GR,CN: MODERATE-SMALL STONES,WETNESS 8-15% GR,CN: MODERATE-SLOPE,SMALL STONES 15+%: SEVERE-SLOPE

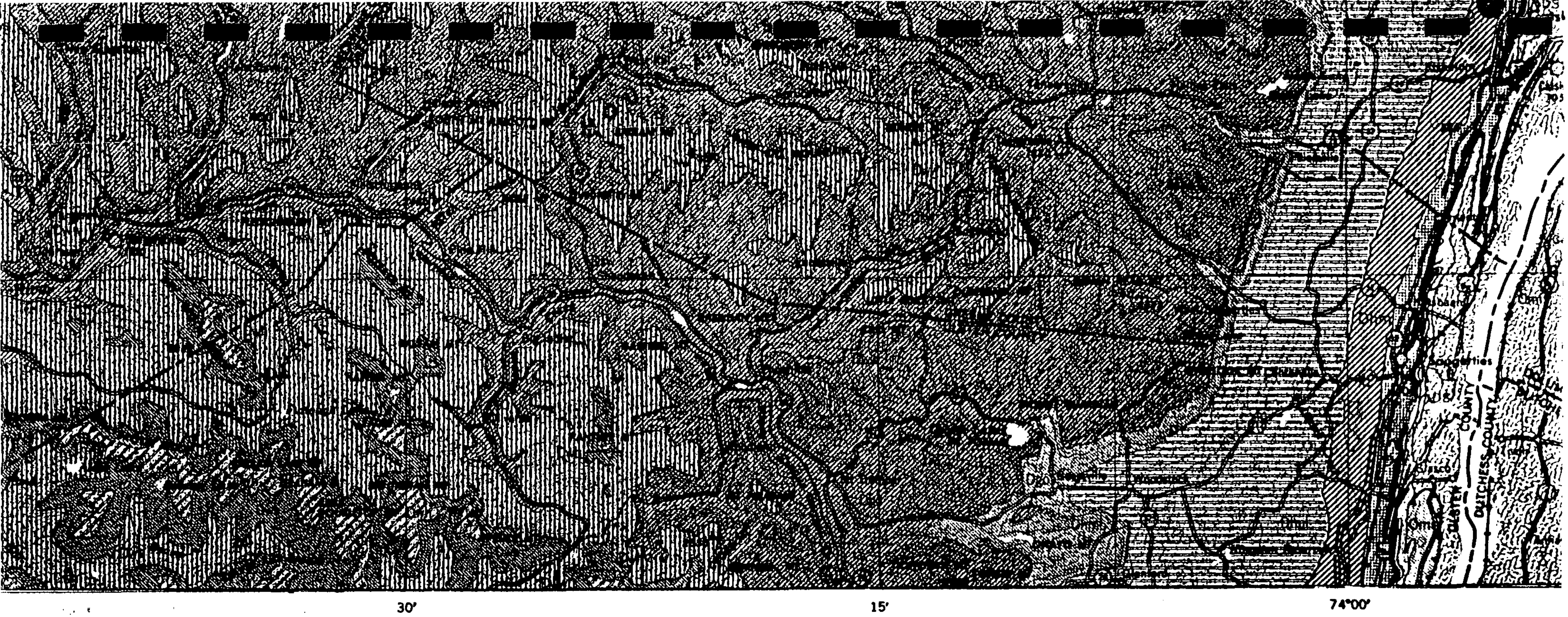
REGIONAL INTERPRETATIONS

CONSTRUCTION MATERIAL (B)

ROADFILL	0-25%: POOR-LOW STRENGTH 25+%: POOR-SLOPE,LOW STRENGTH
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	0-15%: POOR-THIN LAYER,TOO CLAYEY 15+%: POOR-SLOPE,THIN LAYER,TOO CLAYEY

WATER MANAGEMENT (B)

POND RESERVOIR AREA	0-3%: SLIGHT 3-8%: MODERATE-SLOPE 8+%: SEVERE-SLOPE
EMBANKMENTS DIKES AND LEVEES	MODERATE-HARD TO PACK,WETNESS
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	0-3%: PERCS SLOWLY,FROST ACTION 3+%: PERCS SLOWLY,FROST ACTION,SLOPE
IRRIGATION	0-3%: WETNESS,PERCS SLOWLY,ERODES EASILY 3+%: WETNESS,PERCS SLOWLY,SLOPE
TERRACES AND DIVERSIONS	0-8%: ERODES EASILY,WETNESS 8+%: SLOPE,ERODES EASILY,WETNESS
GRASSED WATERWAYS	0-8%: PERCS SLOWLY,ERODES EASILY 8+%: SLOPE,PERCS SLOWLY,ERODES EASILY



GEOLOGIC MAP OF NEW YORK

1970

Hudson-Mohawk Sheet

Scale 1:250,000

5 0 5 10 15 Statute Miles 20

5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

Appendix 1.3-3
1 of 4

RECREATIONAL DEVELOPMENT (B)

CAMP AREAS	0-8%: MODERATE-WETNESS,PERCS SLOWLY 8-15%: MODERATE-SLOPE,WETNESS,PERCS SLOWLY 15+%: SEVERE-SLOPE	PLAYGROUNDS	0-6%SIL,SICL,L:MODERATE-WETNESS,PERCS SLOWLY 6+% SIL,SICL,L: SEVERE-SLOPE 0-6% GR,CN: SEVERE-SMALL STONES 6+% GR,CN: SEVERE-SLOPE,SMALL STONES
PICNIC AREAS	0-8%: MODERATE-WETNESS,PERCS SLOWLY 8-15%: MODERATE-SLOPE,WETNESS,PERCS SLOWLY 15+%: SEVERE-SLOPE	PATHS AND TRAILS	0-25% SIL,SICL,L: SEVERE-ERODES EASILY 25+% SIL,SICL,L: SEVERE-SLOPE,ERODES EASILY 0-15% GR,CN: MODERATE-WETNESS 15-25% GR,CN: MODERATE-SLOPE,WETNESS 25+% GR,CN: SEVERE-SLOPE

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CLASS-DETERMINING PHASE	CAPA-BILITY		CORN SILAGE (TONS)		ALFALFA HAY (TONS)		WHEAT (BU)		GRASS HAY (TONS)		PASTURE (AUM)		TREFOIL-GRASS HAY (TONS)		OATS (BU)	
	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
0-3%	2W		24		6.0		50		4.0		9.5		3.5		70	
3-8%	3E		34		5.0		60		4.0		9.5		3.5		70	
3-8% SEV ER	3E		22		4.5		40		3.5		8.5		3.0		60	
8-15%	3E		22		4.5		45		3.5		8.5		3.5		65	
8-15% SEV ER	4E		20		4.0		35		3.0		7.5		3.0		60	
15-25%	4E		20		4.0		35		3.0		7.5		3.0		60	
15-35% SEV ER	6E		-		-		-		-		-		-		-	
25-35%	6E		-		-		-		-		-		-		-	
35+%	7E		-		-		-		-		-		-		-	

WOODLAND SUITABILITY (C)

CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDX	
3-8%	2O	SLIGHT	SLIGHT	SLIGHT	SLIGHT		NORTHERN RED OAK	80	EASTERN WHITE PINE
8-15%	2R	MODERATE	SLIGHT	SLIGHT	SLIGHT		SUGAR MAPLE	70	YELLOW-POPLAR
15-35%	2R	SEVERE	MODERATE	SLIGHT	SLIGHT		EASTERN WHITE PINE	65	BLACK CHERRY
35+%	2R	SEVERE	SEVERE	SLIGHT	SLIGHT		WHITE ASH	65	BLACK WALNUT

WINDBREAKS

CLASS-DETERMIN'G PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

WILDLIFE HABITAT SUITABILITY (C)

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
3-8%	FAIR	GOOD	GOOD	GOOD	GOOD	-	POOR	V. POOR	GOOD	GOOD	V. POOR	-
8-15%	FAIR	GOOD	GOOD	GOOD	GOOD	-	V. POOR	V. POOR	GOOD	GOOD	V. POOR	-
15-25%	POOR	FAIR	GOOD	GOOD	GOOD	-	V. POOR	V. POOR	FAIR	GOOD	V. POOR	-
25-35%	V. POOR	FAIR	GOOD	GOOD	GOOD	-	V. POOR	V. POOR	FAIR	GOOD	V. POOR	-
35+%	V. POOR	POOR	GOOD	GOOD	GOOD	-	V. POOR	V. POOR	POOR	GOOD	V. POOR	-

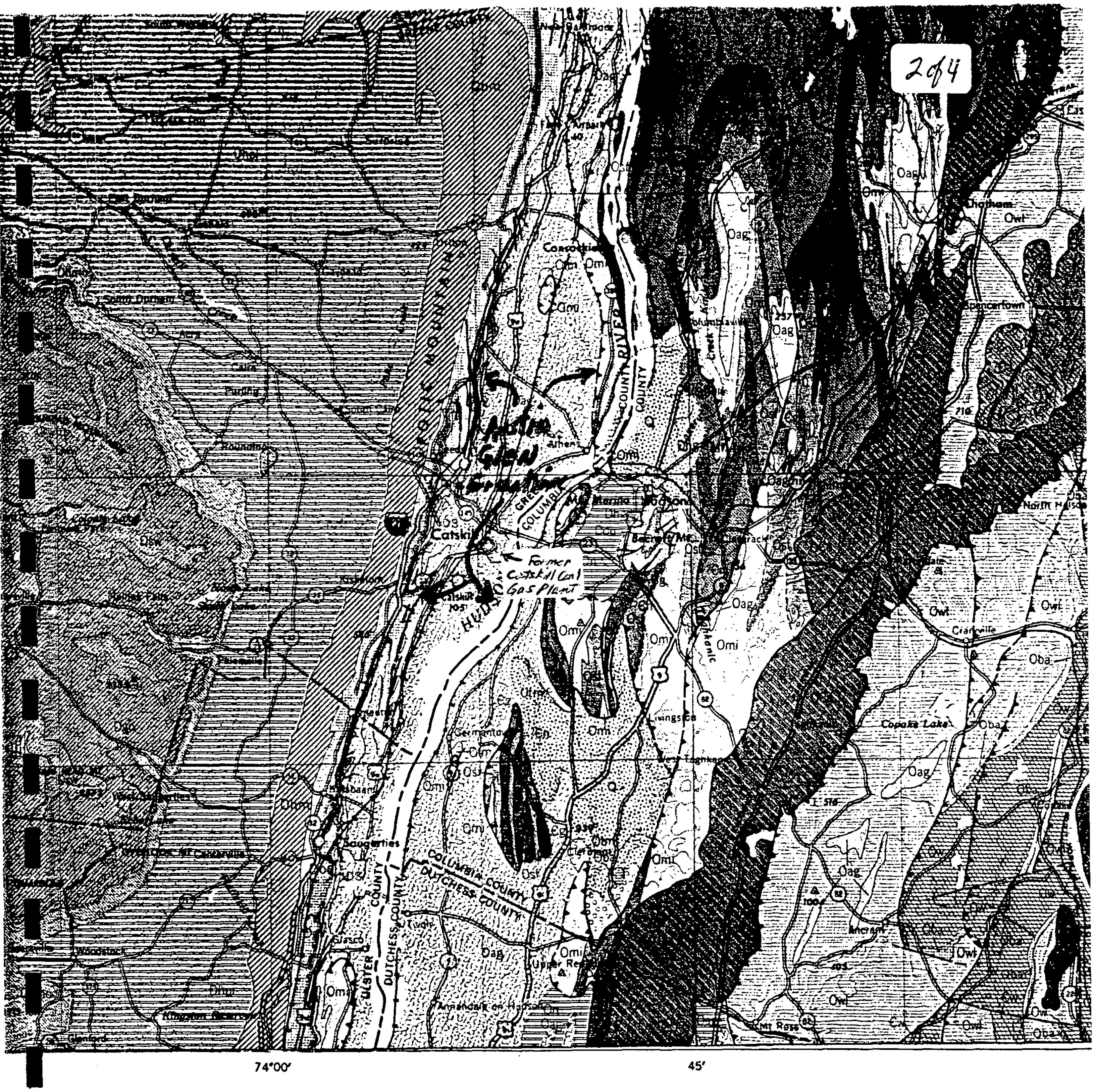
POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS NORMAL YEARS UNFAVORABLE YEARS						

FOOTNOTES

A ESTIMATES OF ENGINEERING PROPERTIES ARE BASED ON TEST DATA FROM SIMILAR SOILS.
B RATINGS BASED ON NSH, PART II, SECTION 403, MARCH 1978.
C RATINGS BASED ON SOILS MEMOS 26, SEPT, 1967; OR 74, JAN, 1972.

2 of 4



YORK

COMPILED AND EDITED BY
Donald W. Fisher
Yngvar W. Isachsen
Lawrence V. Rickard
March, 1970

Statute Miles 20

ilometers 30

3 of 4

ange (Ordovician only).

nd [redacted] patterns: igneous or meta-igneous rocks (except mng) ed [redacted] fore the symbol of a mapping unit signifies that the tha[redacted] the age indicated. A query placed after the symbol of gnifies doubt concerning the identification of that unit. er margin on the "color boxes" signifies that the unit has re[redacted]onship with subjacent units, however not necessarily it l[redacted]ed. Wavy lines signify parallel unconformities; saw- angular unconformities.

re[redacted]denote igneous or meta-igneous rocks.

EPO[redacted]TS
n. [redacted]

ES [redacted]
asa[redacted] dikes; not

[redacted]
m.)
hale
one[redacted]shale, con-
Moreland Shales.
sa[redacted]stone, con-

[redacted]
m.)
-shale, siltstone,
sa[redacted]tone. con-

[redacted]
0 m.)
ne, conglomerate.
Gilboa Formations

[redacted]

0 m[redacted]
rst[redacted]n and Port-
lembers; In east:
le and sandstone
, s[redacted]tone, sand-

Solsville, Otsego,
lsto[redacted] Members,
on [redacted]ings Shale
dstone; Ashokan
Gr[redacted]p—Panther
ollo[redacted] and Union

.ST[redacted]GROUP
n.)
rehouse (cherty),
Ed[redacted]liff cherty
ormation—shale,
; Esopus Shale.
iren[redacted]eous lime-
rt.

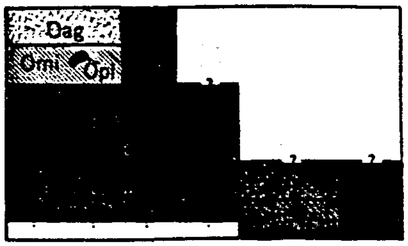
PALEOZOIC

Ordovician

Cambrian

EUGEOSYNCLINAL (ALLOCHTHONOUS) SEQUENCE
up to 6,000 ft.? (2000 m.)

argillaceous Sandstone



Oag	Austin Glen Formation — graywacke, shale.
Omi	Mount Merino and Indian River Formations—shale. slate, chert.
Opl	Pillow lava at Stark's Knob near Schuylerville, Saratoga County.
Op	North of Troy: Poultney Formation ("B" and "C" Members)—shale, slate, siltstone.
Osf	South of Troy: Stuyvesant Falls Formation —shale, siltstone.
O€e	Elizaville Formation—shale, argillite, quartzite.
O€u	Undifferentiated Middle Ordovician thru Lower Cambrian (or older?) allochthonous rocks—principally pelite; lesser quartzite, limestone, conglomerate, graywacke.
€pw	North of Troy: Poultney Formation ("A" Member)—shale, limestone; Hatch Hill Formation—shale, dolostone; West Castleton Formation—shale, limestone, conglomerate.
€g	South of Troy: Germantown Formation—shale, conglomerate, limestone.
?€m	North of 43°: Mettawee Slate, includes Castleton (North Brittain) Conglomerate, Mudd Pond Quartzite, Zion Hill Quartzite, and Bomoseen Graywacke Members.
?€n	South of 43°: Nassau Formation—slate, shale, thin quartzite, includes Stuyvesant Conglomerate, Diamond Rock Quartzite, Curtis Mountain Quartzite, and Bomoseen Graywacke Members.
?€a	Austerlitz Phyllite—minor quartzite.
?€gt	Greenstones and tuffs and/or basalts.
?€r	Rensselaer Graywacke—minor shale.
?€ev	Everett Schist—minor meta-graywacke lenses. Includes Greylock Schist in Massachusetts.

INTRUSIVE PEGMATITE DIKES

☐ p	p	Granite pegmatite dike, unmetamorphosed.

METAMORPHIC ROCKS OF IGNEOUS ORIGIN

■	gb	Metagabbro, olivine metagabbro, and derived amphibolite.
▨ a	a	Metanorthosite and anorthositic gneiss; overprint signifies dark mineral content in excess of 10 percent (mainly gabbroic or noritic metanorthosite).

Relative ages of units listed below are unknown.

METAMORPHIC ROCKS OF SEDIMENTARY ORIGIN
(PROBABLY INCLUDES SOME METAVOLCANICS)

▨ bqp	bqp	Biotite-quartz-plagioclase gneiss, amphibolite, and related migmatite; locally sillimanitic; commonly garnetiferous in and adjacent to Adirondack Highlands.
▨ bqpq	bqpq	Biotite-quartz-plagioclase gneiss, commonly very low in biotite content, with interbedded feldspathic and biotitic quartzite and amphibolite; sillimanite and garnet common, graphite sporadic.
▨ garb	garb	Quartz-feldspar gneiss with variable amounts of garnet, sillimanite, biotite.

dstone, sandstone.
llit schist, meta-

iver, Kings Falls,

Lin tone—chert;
sto .
:k River Groups—
Kings Falls, Glens
id wville Lime-

an Orwell Lime-

'hipple Limestone.
of rly Cambrian
bl -size angular
matrix of Middle
and floors earlier
nia Orogeny.
(neveld) car-
ers caught along
arbonate blocks in

IDG GROUPS,
RM T VALLEY

) m.)

Cre Dolostone;
do tone; Gailor

Island Dolostone;
, ostone; Fort
ton Cutting For-
imestone at top,

nati —limestone,
; lcyon Lake

and dolomitic

tone—chert; Hoyt
oolite.
Fo ation—dolo-
olos e—chert.
tone; Pine Plains
le.
ost , sandstone,

Monkton Quartzite,

nation.

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UNDIVIDED AND MIXED GNEISSES

▥	amg	Interlayered amphibolite and granitic, charnockitic, mangeritic, or syenitic gneiss.
mug	mug	Interlayered metasedimentary rock and granitic, charnockitic, mangeritic, or syenitic gneiss.

MAP SYMBOLS

Observed or approximately located contact. In Proterozoic terranes, direction of dip of bedding and/or foliation indicated by triangle.

Conjectural contact; includes projections beneath extensive Quaternary cover and many contacts based on reconnaissance mapping.

Hypothetical contact; projection across unmapped area.

Fault; where known to be a normal fault, hachures on relatively downthrown side.

Thrust or reverse fault, saw teeth on overthrust block.

Shear zone or topographic lineament. Where mapped in detail, such lineaments are commonly found to be high angle faults with associated fault breccia.

Antiform, showing direction of plunge (in Proterozoic terranes only).

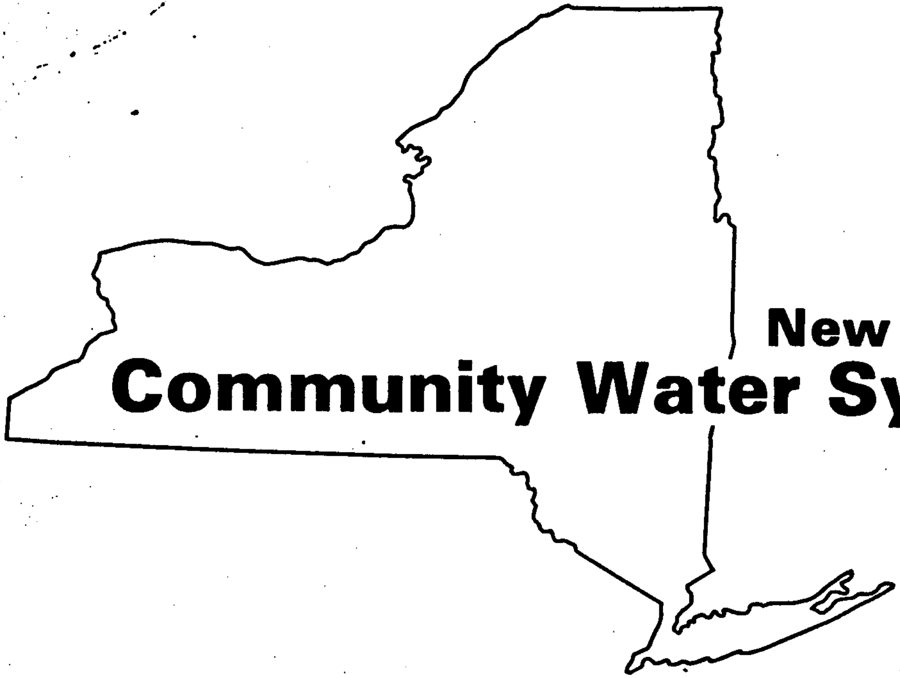
Synform, showing direction of plunge (in Proterozoic terranes only).

Direction of plunge of fold axis or other linear element (in Proterozoic terranes only).

Boundary between areas having bedrock outcrops and areas of extensive Quaternary cover.

almandine

Isograd, dashed where inferred.



New York State Atlas of
Community Water System Sources
1982

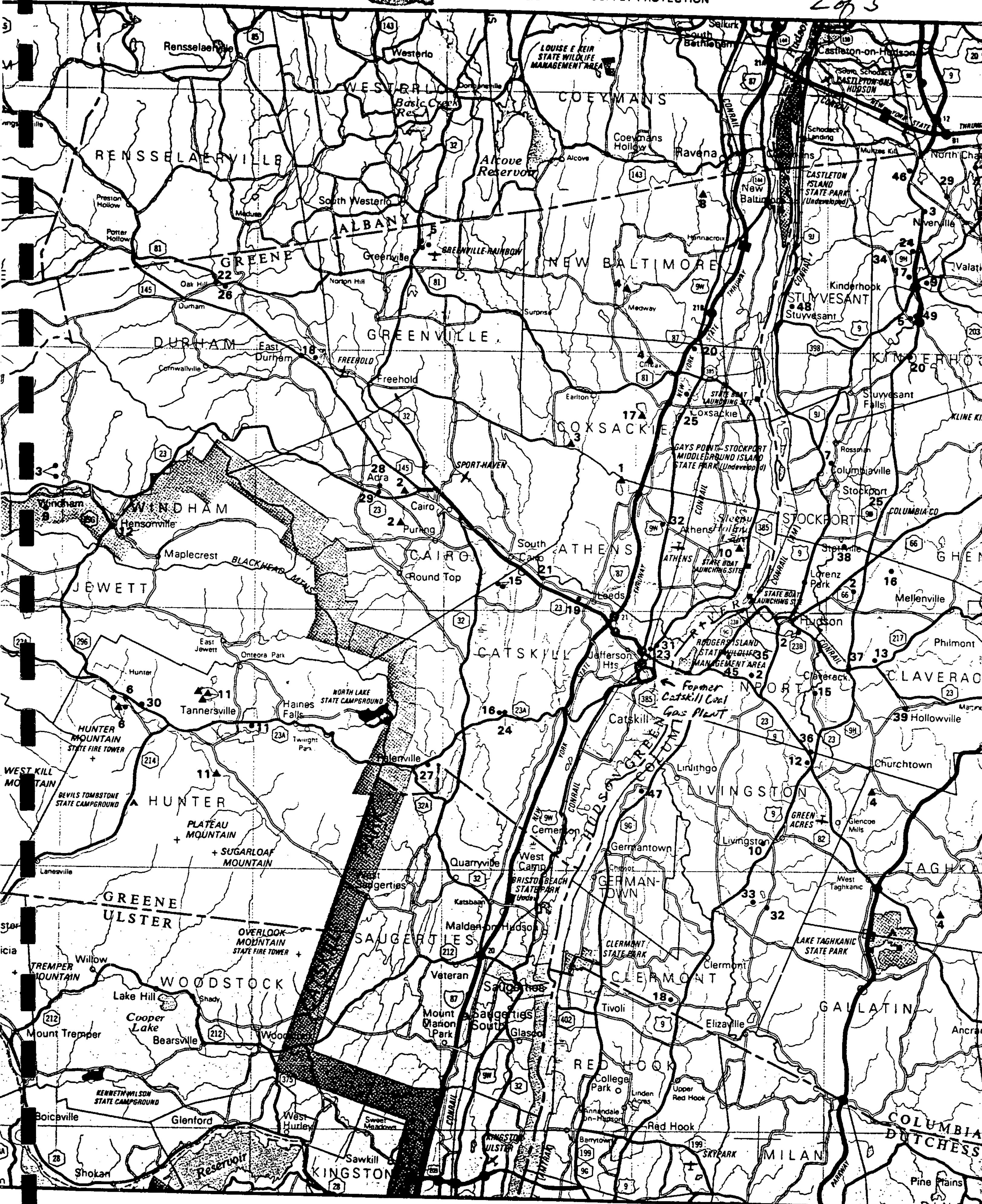
NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

Appendix 1.3-4

WATER SYSTEM SOURCES

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

2 of 3



E NEW YORK STATE DEPARTMENT OF TRANSPORTATION.

SCALE 1:250,000

5 0 5 MILES

NORTH

GREENE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Athens Village	1700.	Hollister Lake
2	Cairo Water Company	800.	2 Reservoirs
3	Catskill Village	8000.	Potuck Reservoir
4	Coxsackie Village	3500.	Climax and Medway Reservoirs
5	Greenville Water District	450.	Wells
6	Hunter Water Company	457.	Creek, Wells
7	Prattsville Water District	400.	Huntersfield Creek, Wells
8	Ravena Village (Albany Co, Page 56)		Hannacroix Creek
9	Ski Windham	365.	Wells (Springs)
10	Sleepy Hollow Lake Subdivision	100.	Sleepy Hollow Lake
11	Tannersville Village	659.	Allen Brook Reservoirs, Schoharie Creek, Wells
12	Windham Water District #1 - Hensonville	200.	Wells
13	Windham Water District #2	600.	Wells, Well (Spring)
Non-Municipal Community			
14	Balnys Apartments	NA.	Wells
15	Chickadee Trailer Court & Camp	360.	Wells
16	Chalet Apartments	36.	Wells
17	Coxsackie Correctional Facility	1000.	Bronks Lake
18	Coynes Apartments	32.	Wells
19	Diederich's Trailer Park	231.	Wells
20	Feddes Mobile Park	117.	Wells
21	Four Pines Mobile Home Park	18.	Wells
22	Hernandez Apartments	NA.	Wells
23	Kiskatom Mobile Home Park	156.	Wells
24	Martins Trailer Park	78.	Wells
25	Millbrook Trailer Park	144.	Wells
26	Myers Trailer Park	18.	Wells
27	Old Orchard Trailer Park	15.	Wells
28	Pine Tree Apartments North	NA.	Wells
29	Pine Tree Garden Apartments	72.	Wells
30	Scribner Hollow Vacation Townhouses	25.	Wells
31	Sleepy Hollow Apartments	NA.	Wells
32	Twin Ponds Apartments	NA.	Wells
33	Winco Park	66.	Wells