BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION
ADMINISTRATIVE LAW JUDGE _____

In re: Application of Pennsylvania Power & Light Company for Authorization under 52 Pennsylvania Code Chapter 57 to Locate and Construct a 138,000 Volt Electricity Transmission Line and Associated Facilities Between its Altamont 66-12 kV Substation, West Mahanoy Township, and its Port Carbon 66-12 kV Substation, East Norwegian Township, and its Orwigsburg 138/66 kV Tap, North Manheim Township, all in Schuylkill County, Pennsylvania.	Application Docket No. A00102534 n

APPLICATION OF PENNSYLVANIA POWER & LIGHT COMPANY FOR CERTIFICATION OF FRACKVILLE-ORWIGSBURG 138 kV TRANSMISSION LINE

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

1. Applicant is the Pennsylvania Power & Light Company (PP&L), duly incorporated in Pennsylvania for the purpose of supplying light, heat and power by means of electricity, having its principal business office at Two North Ninth Street, Allentown, Pennsylvania 18101.

2. PP&L's attorneys are John Antonuk and David J. Dulick, whose address is Two North Ninth Street, Allentown, Pennsylvania 18101, and who are authorized to receive all notices and communications regarding this Application.

3. PP&L proposes to construct, operate and maintain a 138,000 volt (138 kV) electricity transmission line between its Altamont 66-12 kV Substation (West Mahanoy Township, Schuylkill County) and the Port Carbon 66-12 kV Substation (East Norwegian Township, Schuylkill County) and the Orwigsburg 138/66 kV Tap (North Manheim Township, Schuylkill County). The proposed line will be approximately 11.6 miles in length and will be located on a right of way that will vary between seventy (70) and one hundred (100) feet in width. It will traverse land in the Townships of North Manheim, West Mahanoy, Ryan, Blythe and East Norwegian, and in the Boroughs of Port Carbon and Palo Alto, all in Schuylkill County.

4. Detailed descriptions of the proposed line and substation, including pertinent design and operational features, are contained in Applicant's Exhibit "A", which is attached hereto and made a part of hereof.

5. The Frackville-Orwigsburg 138 kV Line is required to: reinforce reliability of supply to the area south of Frackville for an outage of the Frackville-Cressona line or one of the two Fishbach-Frackville lines, reinforce reliability of supply to the area south of Pottsville known as the Cressona/Orwigsburg area for an outage of one or both circuits of the double circuit Fishbach-Pine Grove and Frackville-Cressona lines, and to provide flexibility to supply expected new loads. This line will also provide the functional advantages of independent two-way supply to the Port Carbon, Orwigsburg and Cressona area supply substations. Need for the proposed project is more fully set forth in

Applicant's Exhibit "B", which is attached hereto and made a part hereof.

6. The proposed line will be designed, constructed, operated and maintained in accordance with the National Electric Safety Code and shall include such further design, construction and maintenance features as are required by the standards of PP&L and by law.

7. Pursuant to the provisions of 52 **Pennsylvania Code**, Chapter 57, PP&L has conducted detailed studies to determine and minimize environmental impacts of the line, including but not limited to effects upon scenic and historic areas, land use, soil and sedimentation, plant and wildlife habitats, terrain, hydrology and landscape. The location and design of the proposed line have been evaluated in light of those studies. A description of those studies is contained in Applicant's Exhibit "A".

8. Pursuant to 52 **Pennsylvania Code**, Chapter 57, PP&L has undertaken studies to locate and identify archaeologic, geologic, historic, scenic and wilderness areas of significance within two miles of the proposed right of way. The location and design of the proposed line have been evaluated in light of those studies. A description of those studies, as well as the location and identity of such sites, is contained in Applicant's Exhibit "A".

9. There are no airports within two miles of the nearest limit of the right of way of the proposed line. There are nine (9) airports located in or near the study area. PP&L has

applied to the Federal Aviation Administration and the Pennsylvania Bureau of Aviation for any necessary permits.

10. PP&L has considered all reasonable corridors for the proposed line. The preferred route was chosen because it has a comparatively low environmental impact, is consistent with future system development, and is lowest in total project cost. A more detailed description of PP&L's route selection process is contained in Applicant's Exhibit "A".

11. PP&L will contact the Pennsylvania Department of Environmental Resources to ensure compliance with applicable laws and regulations under that Department's jurisdiction. Furthermore, at or near the inception of construction, necessary permits for public road and highway occupancy will be sought.

12. The current estimated total cost of constructing the proposed line is approximately $3,600,000. The projected completion date for the Altamont-Port Carbon portion of the line is November 1982, and the projected completion date for the remaining portion to the Orwigsburg Tap is November 1983.

13. (i) The proposed route is depicted on aerial photographs contained in Applicant's Exhibit "C", which is attached hereto and made a part hereof.

(ii) A description of the proposed line, as currently planned, including, so far as is presently known, the length of the line, the design voltage, the size, number and materials of the conductors, the design of the supporting structures and their height, configuration and materials of

construction, the average distance between supporting structures, the number of supporting structures, the line to structure clearances, and the minimum conductor to ground clearance at midspan under normal load and average weather conditions and under predicted extreme load and weather conditions is contained in the "Engineering Description" section of Applicant's Exhibit "A".

(iii) Photographs of cross sections of the proposed right of way for the line as currently planned and all adjoining rights of way showing the placement of the supporting structures at typical locations, with the height and width of the structures, the width of the right of way, and the lateral distance between the conductors and the edge of the right of way indicated are contained in Applicant's Exhibit "A".

(iv) A system map which shows the location and voltage of all existing transmission lines and substations of PP&L and the location and voltage of the proposed line and associated facilities is contained in Figure 1 of Applicant's Exhibit "B".

14. There is no litigation concluded or in progress concerning any aspect of the proposed line or right of way.

15. The proposed transmission line will be constructed, operated and maintained according to all applicable laws and PP&L's specifications for right of way maintenance. The specifications now in effect for PP&L are entitled "Program for Vegetation Management" and "Soil Erosion and Sedimentation Control On Transmission Line Rights of Way". The proposed vegetation clearing plans for this line are depicted in Applicant's Exhibit "C".

WHEREFORE, PP&L requests that the Pennsylvania Public Utility Commission approve the location and construction of the 138 kV Frackville-Orwigsburg electricity transmission line and associated facilities as proposed.

Respectfully submitted,

PENNSYLVANIA POWER & LIGHT COMPANY
By:

David J. Dulick

John Antonuk

Its Attorneys

Dated October 22, 1980
at Allentown

A F F I D A V I T

COMMONWEALTH OF PENNSYLVANIA)
: SS
COUNTY OF LEHIGH)

HARLEY L. COLLINS, being duly sworn according to law, deposes and says that he is Senior Vice President, System Planning & Engineering of Pennsylvania Power & Light Company; that he is authorized to and does make this affidavit for it; and that the facts set forth in the foregoing "Application of Pennsylvania Power & Light Company for Certification of Frackville-Orwigsburg 138 kV Transmission Line" are true and correct to the best of his knowledge, information and belief.

Harley L. Collins

Sworn to and subscribed
before me this 21ST day of
OCT. 1980

JOHN P. MILLER, JR., Notary Public
Allentown, Lehigh County, Pa.
My Commission Expires May 24, 1981

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION
ADMINISTRATIVE LAW JUDGE _____

In re: Application of Pennsylvania Power & Light Company for Authorization under 52 Pennsylvania Code Chapter 57 to Locate and Construct a 138,000 Volt Electricity Transmission Line and Associated Facilities Between its Altamont 66-12 kV Substation, West Mahanoy Township, and its Port Carbon 66-12 kV Substation, East Norwegian Township, and its Orwigsburg 138/66 kV Tap, North Manheim Township, all in Schuylkill County, Pennsylvania	:	Application Docket No. _____

CERTIFICATION OF SERVICE

I certify that I have this date served by certified mail, return receipt requested, a copy of the above-captioned application on the following:

Schuylkill County Board of Commissioners
c/o Mr. Edward H. Cook, Chairman
Court House
Pottsville, Pennsylvania 17901

Schuylkill County Planning & Zoning Commission
c/o Mr. Charles M. Ross, Executive Director
Court House
Pottsville, Pennsylvania 17901

North Manheim Township Supervisors
c/o Mr. Charles McKeone, Sec/Treas.
Haven Fair Lawn
Box 4520
R.D. #4
Pottsville, Pennsylvania 17901

North Manheim Township Planning Commission
c/o Mr. Glen Dierwachter, Chairman
Box 4486
R.D. #4
Pottsville, Pennsylvania 17901

West Mahanoy Township Supervisors
c/o Mr. Leonard Tragus, Secretary
Township Building
190 Pennsylvania Avenue
Shenandoah Heights, Pennsylvania 17976

Ryan Township Supervisors
c/o Mr. Edward L. Konsavage, Sec/Treas.
Locust Valley
Barnesville, Pennsylvania 18214

Ryan Township Planning Commission
c/o Ms. Margaret Kralick, Chairman
Hosensock
Barnesville, Pennsylvania 18214

Blythe Township Supervisors
c/o Mr. Stanley Dobies, Chairman
P. O. Box 416
Cumbola, Pennsylvania 17930

Blythe Township Planning Commission
c/o Mr. Kenneth Wagner, Chairman
R.D. #1
Tamaqua, Pennsylvania 18252

East Norwegian Township Supervisors
c/o Mr. Andrew Androshick, Sec/Treas.
R.D. #3
Pottsville, Pennsylvania 17091

Port Carbon Borough Supervisors
c/o Mr. Mike Sninsky, Secretary
P. O. Box 71
Port Carbon, Pennsylvania 17901

Port Carbon Borough Planning Commission
c/o Mr. Joseph Grabowski
548 West Third Street
Port Carbon, Pennsylvania 17965

Palo Alto Borough Supervisors
c/o Mayor Robert J. Quinn
137 West Savory Street
Pottsville, Pennsylvania 17901

Schuylkill Haven Water Authority
c/o Mr. Charles R. Feindler, Borough Manager
Borough Office Building
39 Dock Street
Schuylkill Haven, Pennsylvania 17972

And I further certify that I have this date served by certified mail, return receipt requested, a notice regarding that application and containing the information required by 52 Pa. Code Section 57.74(c)(2) on the following:

Dr. Jacob W. Gruber, Chairman
c/o William J. Wewer, Executive Director
Pennsylvania Historical and Museum Commission
Box 1026
Harrisburg, Pennsylvania 17120

The Honorable Thomas D. Larson, Secretary
Pennsylvania Department of Transportation
1200 Transportation and Safety Building
Harrisburg, Pennsylvania 17120

David J. Dulick

Dated October 22, 1980
at Allentown, Pennsylvania

A00102534

ORIGINAL

FRACKVILLE-ORWIGSBURG 138 kV TRANSMISSION TAP

PRMD 8 CERTIFICATION APPLICATION BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION APPLICATION DOCKET NO. _____

Volume 1

- APPLICATION EXHIBIT 'A'- ENVIRONMENTAL AND ENGINEERING STUDY
- APPLICATION EXHIBIT 'C'- DEPICTIONS OF PROPOSED LINE ROUTE

SUBMITTED BY:

PENNSYLVANIA POWER AND LIGHT CO.

FRACKVILLE-ORWIGSBURG 138 kV TRANSMISSION TAP

PRMD 8 CERTIFICATION APPLICATION BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION APPLICATION DOCKET NO. _____

- APPLICATION EXHIBIT 'A' - ENVIRONMENTAL AND ENGINEERING STUDY
- APPLICATION EXHIBIT 'B' - PURPOSE AND NECESSITY STATEMENT
- APPLICATION EXHIBIT 'C' - DEPICTIONS OF PROPOSED LINE ROUTE

SUBMITTED BY:

PENNSYLVANIA POWER AND LIGHT CO.

FRACKVILLE ORWIGSBURG

138 kV TRANSMISSION LINE STUDY

Volume 1

APPLICATION EXHIBIT 'A'

FRACKVILLE-ORWIGSBURG

138 kV TRANSMISSION LINE

ENVIRONMENTAL AND ENGINEERING STUDY

PREPARED BY:
PENNSYLVANIA POWER AND LIGHT CO.

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INTRODUCTION

This report was prepared by Pennsylvania Power & Light Company for certification of the Frackville - Orwigsburg 138 kV Line route as required by Pennsylvania Public Utility Commission Regulations at PRMD-8. This line is intended to improve electrical capability and reliability in central Schuylkill County. The line will be constructed for 138 kV capability, but operated at 66 kV until its conversion. The preferred route is the route determined from the analysis of several acceptable alternatives to be the best from an environmental and cost standpoint.

SUMMARY

After a study area was established, three preliminary line routes were determined from an analysis of the environmental data and estimated construction costs. The Western Route was dropped because of its greater environmental impacts and significantly higher construction costs (Map 2).

Four line route alternatives were generated from the two remaining preliminary line routes.

The Eastern Route, the preferred route, involves: (1) replacing an existing single circuit transmission line with a double circuit line and (2) building a double circuit line (single circuit installed initially) partly on unoccupied PP&L right-of-way and partly on new right-of-way.

The Railroad Route, which is the primary alternative, utilizes abandoned railroad beds, parallels active railroads, and shares a common segment with the Eastern Route. The other two alternatives studied are combinations of the Eastern and Railroad corridors.

The Eastern Route has the following principal advantages:

1) A comparatively low environmental impact.

2) The total project cost of $3,576,100 is $81,300 less than the Railroad Route.

3) It provides flexibility to improve the existing electrical system.

4) It provides a higher degree of reliability.

PROJECT LOCATION

The project area is located within the Appalachian Mountain Section of the Valley and Ridge Physiographic Province of Pennsylvania. A series of steep parallel ridges that run through the study area from northeast to southwest are its most prominent topographic features (Location Map, page 3).

Pottsville, located in the center of the study area, is the county seat and has the largest population in the county. Other densely populated municipalities are: Frackville, located near the northern boundary; Schuylkill Haven, located near the southern boundary; Orwigsburg, lying in the southeast portion; Saint Clair and Port Carbon, located in the central portion; and Minersville, located near the western boundary.

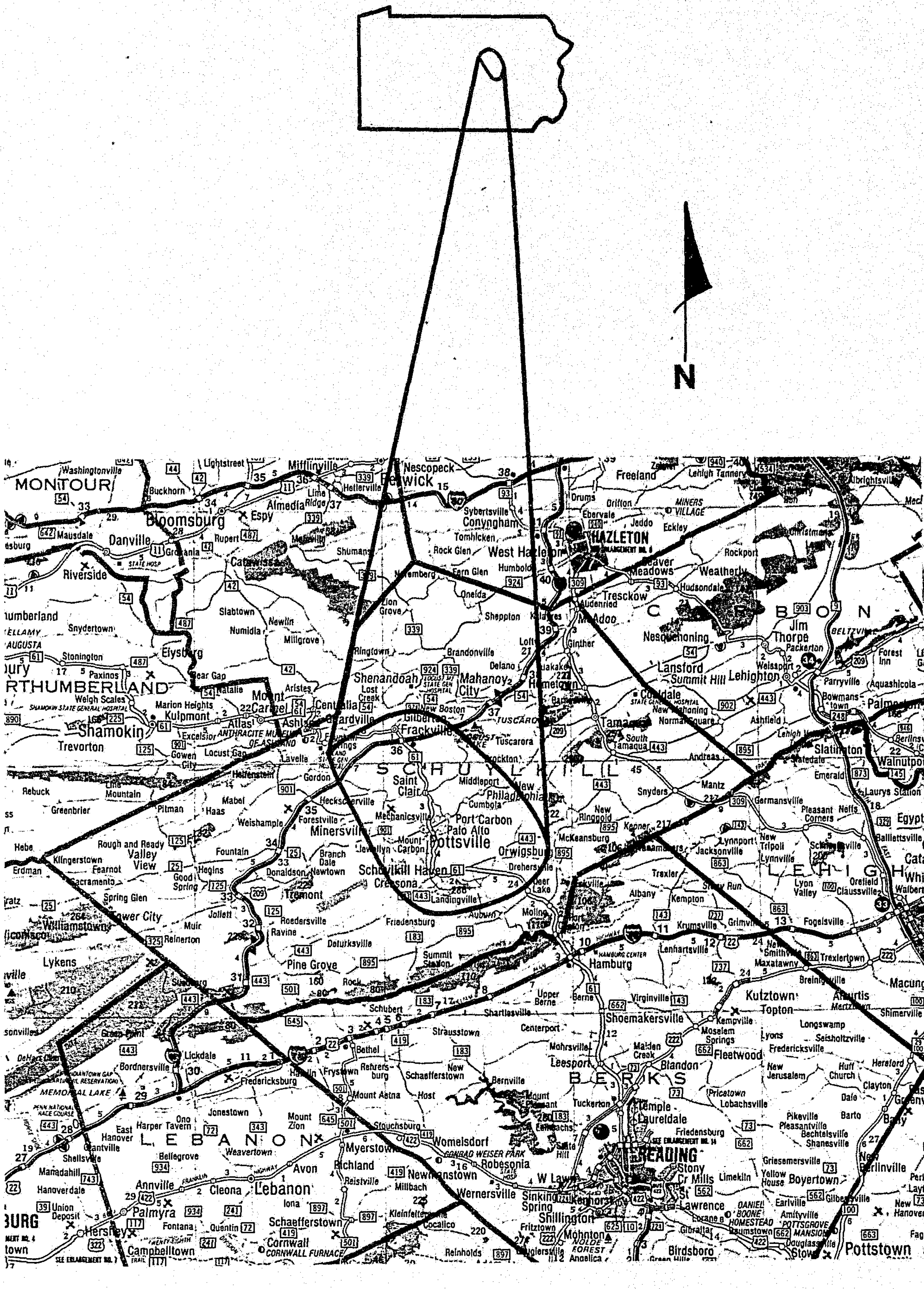
In addition to these developed areas, other significant land uses are strip mining and agriculture. Commercial and industrial land uses have developed along Route 61, a major north-south highway.

DELINEATION OF STUDY AREA (See Map 1)

The boundaries of the study area were influenced by functional requirements, environment, economics, and PRMD-8 regulations. Its north and south boundaries were a direct result of the functional requirements. On the north, the Frackville Substation is the source and to the south, the Orwigsburg or Cressona lines (or substations) are the end points. The eastern study area boundary was influenced by vacant PP&L right-of-way. The eastern study area boundary is drawn to the point where it was no longer economically feasible to utilize this vacant right-of-way. The western study area boundary was also determined by unoccupied PP&L right-of-way and land use.

The study area is approximately 125 square miles (14 x 9 miles).

PENNSYLVANIA



LOCATION MAP

METHODOLOGY

The following steps were followed in selecting line route alternatives.

First, an environmental inventory of the entire study area was undertaken. Its results are found on Maps 1 thru 12. A description of each map is provided in the "Study Area Environment - Inventories" section of this report.

Second, these maps were used individually to generate preliminary routes by attempting to avoid the more environmentally sensitive areas. Using a transparent segment overlay, each inventory map was viewed with respect to the impacts resulting from the segment. Realignment of segments was then made to reduce the impacts where possible. Quantitative measurements of impacts were tabulated for each segment and compared.

Third, the engineering design and right-of-way widths were determined for each segment. Engineering line design is predicated by line voltage, current-carrying requirements, and topography. Right-of-way widths are established by the line design voltage, structure type, and the natural and visual environment. PP&L standards in these areas are discussed in the "Engineering Data" and "Engineering Description" sections of this report.

The fourth step was to estimate, for each segment, the costs for right-of-way acquisition, initial vegetation clearing, construction of access roads, line construction, and future maintenance.

In step five, segments were arranged into line routes and analyzed to determine the optimum route. The preferred route was selected by examining electrical, environmental and economic impacts of each route during initial construction and subsequent maintenance. In addition to quantitative comparisons found in the tables, qualitative considerations were addressed in the "Route Evaluation" and "Mitigating Measures" sections of this report. Also, field reviews were made on numerous occasions during the study.

In the final step, project routes and conclusions were reviewed within PP&L for comments and concurrence. They were also reviewed with appropriate local, state, and federal agencies and municipalities.

ENVIRONMENTAL INVENTORY GUIDELINES

An environmental inventory is a listing of environmental factors analyzed in selecting a transmission line route. The inventory identifies those categories considered important or significant in transmission line siting. These factors can be adversely affected or compatible with transmission facilities. These factors and reasons why they are inventoried are listed in the following table:

CATEGORY	WHY INVENTORIED
1. Linear Features ..... a. turnpikes, interstate highways, major LR Routes b. pipelines c. railroads d. floodwalls, levees e. communication lines f. property lines g. power lines h. tree rows	Paralleling existing linear features, particularly transmission lines, is often desirable. Paralleling usually adds only increments to existing impacts rather than creating new impacts for several reasons: narrower right of way (maximum utilization of land already encumbered), ability to use existing access roads, less tree clearing, lessened visual impacts, and, from a community planning perspective, the combination of line features into a common corridor.
II. Land Use	
a. Residential..... 1. dwellings 2. sub-divisions 3. developments 4. future developments 5. urbanized areas	Avoiding interference with present and proposed residential land use is important in decreasing costs and potential visual intrusion. Also, possibilities for compatible joint uses of land are explored.
b. Commercial and Industrial	Since these areas are generally compatible with transmission facilities, the possibility of routing through these areas is explored.

c. Interference Zones....These areas are usually avoiding entirely. If this is not feasible, undergrounding is considered.
   1. radio stations
   2. micro-wave towers
   3. airports

d. Agricultural .....Generally this is a compatible land use. There is minimal impact at the edges of these areas. The number of structures is kept to a minimum, and irrigation equipment is avoided.
   1. cropland
   2. pasture
   3. Class I & II soils

e. Public Areas .....Visual intrusion into these areas should be avoided where possible.
   1. cemeteries
   2. churches
   3. hospitals
   4. schools

f. Recreational Areas ...Visual intrusions into these areas should be avoided where possible.
   1. parks
   2. golf courses
   3. ski areas
   4. preserves and game lands

g. Extractive .....Areas which have extractive mineral resources are generally avoided. Where practical, lines span small areas and are routed along boundaries.
   1. coal
   2. limestone
   3. peat bogs

h. Orchards and Nurseries .....Removal of productive trees and interference with orchard maintenance (spraying, irrigating, etc.) are avoided where possible.

3. Visual and Scenic Features

a. Unique Scenic Areas ..It is preferrable to avoid these areas.

b. Highpoints .....These features are avoided where practical. Attempts are also made to eliminate or minimize visual intrusion in areas of potentially high visual exposure, especially areas of high scenic quality. Views from residential areas should be avoided, if possible.
   Prominant slopes
   Ridge lines
   Panoramic views
   Highway viewsheds
   Scenic highways
   Residential areas

4. Soils & Slopes

a.	Soils ..... shallow bedrock stony soils wet soils erodible soils	These soil types are generally avoided due to both construction and environmental constraints. Higher construction cost and disruption to the area result from blasting, road construction, structure grading and setting, and material handling and hauling.
b.	Slopes.....	Steep slopes (15%-25% or greater) are avoided where possible in order to minimize potential for soil erosion and slower revegetation. Again, increased construction costs and environmental damage may occur when building on slopes due to road construction, vegetation clearing, and the handling, hauling and setting of structures.
c.	Floodplain soils	These soils are generally avoided to prevent potential disruption of floodplains and flood control levees, etc., because increased construction costs are necessary to maintain reliability.

5. Cultural Features

a.	Historic Sites	Visual intrusion on historic setting are avoided where practical.
b.	Archeological Areas ..	Known sites and areas of high potential should be avoided to prevent damage to resources.

6. Geology ..... Information on bedrock type is used to analyze mineral resources and in predicting the potential presence of endangered species and other wildlife. Special attention is given to certain bedrock types with particular characteristics or

problems. Limestone, caves, springs, and sinkholes should be avoided.

Unique Geological Areas ...Visual intrusion on unique formations and destruction of collection sites should be avoided where practical.

7. Natural Features

1. Aquatic Resources

Water Bodies, Streams, Rivers:

1. Water Quality ...The potential for siltation, contamination of water by chemicals, and temperature increases due to removal of bank vegetation should be avoided to the greatest extent possible. Measures used to mitigate effects when crossing water bodies may result in reduced reliability or increased maintenance costs.

Special caution is exercised near waters recognized for exceptional quality if these areas cannot be avoided.

2. Fish, Aquatic Life ...Major aquatic organisms present are determined in order to predict potential impacts.

Widely-used fisheries are avoided. If this is not practical, caution is exercised in crossing to prevent decrease in water quality, especially due to siltation.

The presence or likely occurrence of endangered or rare aquatic species is determined, and known locations are avoided or impacts are mitigated.

b. Terrestrial Resources

1. Vegetation Types .....Major types of vegetation are determined to characterize area habitats and predict the occurrence of wildlife species and potential impacts of removal of these vegetation types.

Important areas are identified, especially vegetation not common in the area, and attempt are made to avoid them where possible e.g., coniferous growth in a primarily deciduous woodland; trees in an urban area, etc.).

Forested areas are generally avoided to minimize clearing, which is considered a major constraint due to disruption of existing environment, costs of clearing, future maintenance, and reduced reliability in wooded areas. However, clearing through areas of heavy woodland can benefit wildlife as open areas resprout and are widely used as browse and cover areas.

Attempts are made to avoid or minimize interference with commercially-used vegetation - tree plantations, lumbering operations, etc.

It may be desirable to utilize open areas, scrubland, and brushland for routing a transmission line.

2. Wildlife.....Positive and negative impacts on area species are predicted.

Potential impacts on game species are assessed.

Major flyways are avoided or problems in these areas are mitigated.

	The presence or likely occurrence of endangered or rare animal species or their critical habitat requirements are checked. Known areas of occurrence are avoided or impacts are mitigated.
3. Unique, Natural Wilderness Areas	Visual intrusion and disruption of the natural environment are avoided where possible.

STUDY AREA ENVIRONMENT - INVENTORIES

A detailed study area inventory was done to identify the relevant environmental factors considered in selecting a transmission line route. Each of the factors was plotted on transparent overlays using a composite base map made from USGS quadrangle sheets. The scale of the base and overlay maps is one inch to 2,640 feet, the largest scale manageable for a study area this size.

These inventory maps are listed below. The impact of siting a transmission line on each major constraint category is discussed in the succeeding paragraphs.

Map 1	Base Map and Linear Features
Map 2	Base Map with Preliminary Routes
Map 3	Topography (Slopes)
Map 4	Shallow Soils - Unique Geological Areas
Map 5	Soils - II
Map 6	Mineral Resources
Map 7	Natural Resources
Map 8	Land Use
Map 9	Zoning
Map 10	Recreation and Scenic Areas
Map 11	Visual Exposure
Map 12	Cultural Resources

Map 1 -Existing Linear Features

Linear land uses, such as transmission lines, railroads, pipelines, highways, vacant right-of-way, and telephone lines, offer possible locations for the proposed transmission line. The potential exists to utilize all or part of their existing rights-of-way by paralleling them with a transmission line. This concept can also reduce the amount of forest land to be cleared and shorten the length of new access roads by utilizing existing roads.

The predominant linear features located within the study area are existing transmission lines and vacant PP&L rights-of-way purchased for future lines. The majority of the existing transmission lines are located west of Route 61 and extend in a north-south direction. Most of the vacant right-of-way is located east of Route 61 and extends in a north-southeast direction.

Route 61 and two railroad lines are the other significant linear features which run north to south in the study area. Interstate 81 passes through the northern portion of the study area. The railroad line sections which have been abandoned are shown on Map 1.

The other linear features found in the study area are two gas pipelines located in the southeastern portion of the study area.

Information about linear features was obtained from PP&L maps, field trips, aerial photo interpretation and USGS quadrangle sheets.

Map 3 - Topography (Slopes)

The study area lies in the Appalachian Mountain Section of the Valley and Ridge Physiographic Province. Numerous parallel and subparallel ridges and valleys run in a northeast to southwest direction. These ridges and valleys are the result of differential erosion. The ridges are underlain by well-hardened, resistant formations consisting of sandstones, conglomerates, and quartzites. In contrast the valleys are underlain with softer shales that erode rapidly.

The valley elevations range from 700 to 800 feet; the mountain top elevations range from 1,000 to 1,700 feet.

The major streams flowing through the study area are the West Branch of the Schuylkill River, Mill Creek, and the Schuylkill River. These rivers and streams have cut steep gorges that bisect the ridges and generally run perpendicular to them. Prominent cuts are found parallel to State Route 61 between Interstate 81 and State Route 183, along the West Branch of the Schuylkill River between Minersville and Beckville, and along US Route 209 between Port Carbon and New Philadelphia.

Slope gradient affects the location of a transmission line from a construction, environmental and visual standpoint. It is difficult to build a transmission line on steep slopes (15 percent or greater gradient). There are problems in clearing vegetation, manuevering construction equipment, erecting transmission structures and constructing access roads.

The environmental problems frequently encountered are vegetation management, erosion and drainage control. Transmission structures and the right-of-way clearing are difficult to screen and therefore visible to adjoining areas.

For this study area, slopes were mapped in three categories: below 15 percent; 15 to 25 percent; and greater than 25 percent. Slopes of 15 percent or greater characterized the study area's topography. The steepest slopes, those

exceeding 25 percent, extend in a northeast to southwest direction.

The topography in the northern portion of the study area has been altered by strip-mining.

USGS 7.5 minute topographic maps and a slope gauge were used to determine slope gradients.

Map 4 - Shallow Soils - Unique Geological Areas

The characteristics of soils are an important factor in transmission line siting. They can create construction and engineering problems and result in costly economic solutions and adverse environmental impacts.

Four soil characteristics were identified as significant to transmission line siting: shallow soils, wet soils, erosive soils, and flood-prone areas. Since shallow soils are extensive throughout the study area, they are shown on Map 4, and the other types of soil are shown on Map 5.

In shallow soil areas, explosives may be required for excavation or access road construction, all of which make a project more costly to complete. The environmental problems include revegetation, preventing rapid runoff of water and soil erosion.

Depth to bedrock is shown in three categories: (1) shallow - less than 20 inches to solid bedrock; (2) moderately deep - 20 to 40 inches to solid bedrock; and (3) deep - 40 inches or more to solid bedrock. Most areas of shallow bedrock and moderately deep bedrock are located in the southern portion of the study area which has steeper slopes than the northern portion. The deep bedrock areas are found on the less rugged topography of the northern portion.

Unique geological areas are mapped to avoid having the line destroy or adversely intrude upon them.

There are two unique geological sites found within the study area. The first site is near Deer Lake and contains some common and rare invertebrate fossils. The second site consists of exposed bedrock formations located near State Route 61 at the turn to Palo Alto.

The study area is underlain by various bedrock formations. These formations are composed of Mississippian, Pennsylvanian, and Devonian sedimentary rocks including conglomeratic, siltstones, shale and coal.

Ground water is supplied by water yielding rocks called aquifers which are composed of Pottsville, Mauch Chunk, and Pocono formations. Although the yield and potential of these aquifers are consistent, acid mine-drainage has deteriorated the water quality in many of these formations.

Soils information was obtained from USDA Soil Conservation Service soil maps and text for Schuylkill County. Information on geology and unique geological areas was obtained from publications prepared by the Pennsylvania Geological Survey.

Map 5 - Soils II

The major soil associations found in the study area are Hazleton-Edgemont-Buchanon, DeKalb-Buchanon-Harleton-Edgemont and Harleton-Allenwood-Watson. These associations are primarily coarse textured, sandy and fine textured loams.

The locations of wet soils, erosive soils, and flood-prone areas are shown on Map 5. Wet soil areas are classified as those that are wet year round or seasonally due either to high water table or poor permeability. Atkins silt loam and Shelmadine silt loam are the major wet soils in the study area. These wet soils (high water) are found along the bottom lands and rivers and consequently are subject to frequent flooding.

Wet soils occur predominately in the southern portion of the study area along the tributaries of the Schuylkill River.

Texture, slope, vegetation, precipitation and structure are some of the factors affecting soil erodibility. This report based erodibility primarily upon soil texture, structure and 'K' factor.

A 'K' factor reflects the rate soil erodes when the factors effecting soil erosion are constant. Soils that had a 'K' factor exceeding 0.43 were classified as erodible. On this basis Kendron silt loam and very stony silt loam soils were determined to be erodible. The few areas where erodible soils are located upon steep slopes increases the potential for soil erosion.

Flood-prone areas may pose dangers to any transmission structure sited within them. The study area is within a region that has a history of severe flooding. Heavy rain falling upon steep slopes in narrow valleys contributed to the severe flood damage in 1955 and 1972. The major flood-prone areas occur in narrow bands along the Schuylkill

River, its West Branch and Mill Creek. They are shown on Map 5.

The locations of flood-prone areas were obtained from USGS maps prepared in 1973 outlining 100 year flood areas in Schuylkill County. This means there is about one chance in 100 that any designated area will be flooded in any single year.

Map 6 - Mineral Resources

Transmission lines may pose problems for mining mineral resources, especially strip-mining. Mineral resource areas are mapped to avoid siting a line within an active mining area or within an area with known mineral deposits that could possibly be mined in the future.

Anthracite coal is the most important mineral resource found within the study area. The northern portion of the study area is located within the southern anthracite coal field which is a major coal producing area in northeastern Pennsylvania.

Map 6 shows that most of the coal resources are located between Sharp and Broad Mountains and to the north of Broad Mountain. It also indicates the locations of strip-mined areas and remaining strippable coal fields.

The locations of strip-mined areas were derived from USGS topographic maps, coal investigation maps and aerial photographs. Reports, studies and other publications, cited in the bibliography, were used to determine strippable coal lands.

Map 7 - Natural Resources

Streams, lakes, forests and wildlife are important elements of the natural environment and can be affected in the short-term as well as the long-term by a transmission line constructed on or near them. Map 7, Natural Resources, portrays major natural features within the study area, including mature forest, conifer plantations, wetlands, streams, ponds, reservoirs and reservoir watershed.

This section discusses vegetation, wildlife, fish, endangered and threatened species, and unique natural areas. Scientific names of species are presented in Appendix B.

Vegetation

The study area is within the Valley and Ridge Section of the Oak-Chestnut Forest Region of eastern United States. Although chestnut was once a constituent of this area, its removal by chestnut blight has resulted in the area now generally being classified as an Oak-Hickory forest type. Secondary forests cover much of this area. They are dominated by oaks, especially on the ridges and slopes, with stands of white pine, hemlock, and red maple scattered throughout the area.

Schuylkill County is heavily forested, with over 50 percent of its land area covered by forest. In the study area, much of the northern portion (between Frackville and Saint Clair) and central portion (Sharp and Second Mountain areas) are covered with extensive mature forests. Mature forests are defined as natural stands having 50 percent or more of the trees 50 or more years old and over 30 feet high. The broad valley and some of the uplands south of Second Mountain are used primarily for agriculture, although scattered woodlots are present in the area.

The quality (based on potential wood production, growth form, and species composition) of the forests varies greatly. In general, forested areas north of Sharp Mountain are of much lower quality than forests to the south of Sharp Mountain.

On Broad Mountain south of Frackville, a barrens-type forest community occurs. The trees are generally less than 40 feet in height and are primarily chestnut oak, pitch pine, sassafras, chestnut, and red maple. Scrub oak and two heath shrubs are likely the dominant shrub species. These areas probably resulted from repeated fires. Because of the small size and stunted condition of the trees, there are generally no merchantable pulp or timber resources in the area.

Abandoned strip-mine spoils occupy much of the area between Broad Mountain and Second Mountain. The trees in this area are also generally less than 40 feet in height and contain very little, if any, pulp or timber resources. These areas are dominated by gray birch, with mixtures of trembling aspen, red maple and chestnut oak. There is essentially no ground-cover vegetation in these areas.

The forests in the Sharp Mountain-Second Mountain vicinity vary depending primarily upon topographical features. On the slopes and ridge tops an oak community occurs. Chestnut oak is the dominant species. Red oak, scarlet oak, black oak, and red maple are associates. In the bottomlands

around Tumbling Run Creek, white pine, hemlock, and tulip poplar are more common. Small coves and steep-sided ravines often have an abundance of sweet birch associated with red oak, red maple, and hemlock.

In the southern portion of the study area scattered woodlots interspersed with agricultural land are common. Oaks continue to dominate the forests, although white ash, white pine, and white oak are more common.

In addition to the "natural" forest vegetation of the study area, conifer plantations are frequently encountered. Most of the plantations are pure stands of white pine, scotch pine, red pine, or Norway spruce. Some of the plantations are Christmas tree plantings.

Abandoned agriculture fields are scattered throughout the southern portion of the study area. These areas are generally open fields dominated by various grasses and other herbaceous plants. Some areas that have been abandoned for a longer period are dominated by shrubs and pioneer tree species, especially sumac and sassafras.

Wildlife

Schuylkill County lies within the Alleghanian life zone and the fauna of this area represent a combination of the more southern Carolinian life zone and the northern Canadian zone. Within the study area there are probably differences in the occurrence and abundance of wildlife species. For the purpose of discussion, the study area has been divided into three sections, the relatively flat northern section on Broad Mountain, the central portion characterized by Sharp and Second Mountains, and the predominantly agricultural area south of Second Mountain.

Although many species can be found over the entire study area, some (based on habitat preference) will be more likely to occur in one portion of the study area than another.

The study area contains suitable habitat for several species of amphibians and reptiles. Amphibian species likely to be common in the area include: American toad, wood frog, spring peeper, spotted salamander, northern dusky salamander, red-backed salamander and northern two-lined salamander. The distribution of these species within the study area varies depending on habitat preference. For example, stream salamanders such as the northern dusky and two-lined should be abundant in the northern section and the tributaries of Tumbling Run. On the other hand, spring peepers and American toads are more likely to be distributed throughout the entire area.

The study area falls within the geographic ranges of many reptiles. The following reptile species are likely to be important members of the fanual community: northern water snake, northern black racer, black rat snake, northern copperhead, and snapping turtle. Of this group, the snapping turtle and water snake are likely to be more abundant around farm ponds and slow flowing streams in the southern portion. The copperhead and black rat snake should find habitat in the central and northern portions of the study area more suitable.

Numerous bird species inhabit the study area. As in the case of reptiles and amphibians, the distribution of avian species within the study area varies with the distribution of suitable habitat. Probably the most important aspect of avian ecology pertinent to this study is the use of the study area as breeding sites. Appendix Table C-1 is a list of species reported by the U.S. Fish and Wildlife Service Breeding Bird Survey for Schuylkill County. This survey was conducted in the southwestern portion of Schuylkill County and presents a list of birds that should breed in the southern portion of the study area.

Appendix Table C-2 is a compilation of species reported on three different Breeding Bird Surveys conducted in the eastern part of Schuylkill County and includes species more likely to be found in the central and northern portions of the study area. Although these lists do not include all species that breed in the area, they do present a good indication of the types of birds that are found in the region.

During the winter months fewer species are found in the area. The wintering group includes permanent residents plus migrants from further north. Appendix Table C-3 is a list of species seen during the 1977 Audubon Society's Christmas Count around Hamburg. This Christmas Count is the count closest to the study area and thus the most representative. Included are the number of birds of each species seen during the one-day count. This gives some idea as to species composition and abundance during winter.

The study area provides suitable habitat for both hawks and owls. Although several birds of prey probably nest in the area, the major noteworthy feature is the utilization of nearby ridges as fall migration routes. Hawk Mountain, which is located outside the study area, approximately 7 miles east of Orwigsburg, is a major hawk watching station. It is likely that some migrating hawks utilize the ridges that are located within the study area, but to what extent they are used is unknown. There are no known hawk migration observation points within the study area.

The major game birds in the area are the ruffed grouse and ring-necked pheasant. Pheasants are associated primarily with agricultural land and thus more abundant in the southern portion of the study area. The ruffed grouse, on the other hand, prefers large woodlots and more extensive forest areas. In addition to these species, other game birds include the mourning dove, wild turkey, woodcock, and migratory ducks and geese.

The mammalian species that inhabit the study area vary in distribution and abundance based on the availability of suitable habitat. The most abundant small mammal in forested areas is typically the white-footed mouse. The major small mammal species found in open fields and agricultural lands is the meadow vole. Associated with these two key species are others of lesser importance. These include the short-tailed shrew, meadow jumping mouse, and red-backed vole.

Larger species typical of the area include the opossum, muskrat, raccoon, and red fox. With the exception of the muskrat which is restricted to aquatic habitats, the rest range over a variety of communities and are found throughout the study area.

There are several important game mammals in the study area. The most important small game species are the gray squirrel and eastern cottontail. The gray squirrel is a common inhabitant of both woodlots and unbroken tracts of forest. The abundance of oak species in the region is a key factor in providing suitable habitat for this species. The eastern cottontail is primarily an animal of agricultural areas and patches. Cottontails are also found in wooded areas, although to a lesser degree than found in agricultural land. Although the eastern cottontail is not usually found in forests at higher elevations, the forested portions of Broad, Sharp, and Second Mountains could contain populations of the New England cottontail. The only big game species found in the area is the white-tailed deer.

Fish

The fisheries resources of the area are associated with good quality surface water resources. Surface waters of the study area including ponds, streams, and rivers are illustrated on Map 7. The major streams in the study area are the Schuylkill River, Little Schuylkill River, West Branch of the Schuylkill River, Mill Creek and Pine Creek. There are also numerous smaller streams in the area. A number of small creeks and streams have been dammed to be used as reservoirs.

In order to discuss the fisheries resources of the study area, it is first necessary to consider existing water quality. Within the study area there is considerable variation in water quality, depending primarily on the location of the water in relation to mining activities. A 1968 USGS Report stated that the following streams within the study area were affected by mine drainage: the entire length of the Schuylkill River, most of the West Branch of the Schuylkill River, most of both West and East Norwegian Creeks, the entire length of Mill Creek, the tributary of Mill Creek east to St. Clair, the tributary to the Schuylkill River west of Cumbola, and the southern reaches of Silver Creek north of New Philadelphia. Most of the pollution problems originate north of Sharp Mountain. Most of the streams associated with the reservoirs on Broad Mountain are comparatively clean until they join Mill Creek. There is little impact from mining on the water quality of most other streams within the study area.

In 1974 a water quality and biological study was conducted on the Schuylkill River Basin by the Pennsylvania Department of Environmental Resources. Most of the benthic macro-invertebrates collected from the Schuylkill River in the study area were species which are tolerant of acid drainage, siltation, and low concentrations of dissolved oxygen. The coal-related pollution limited the diversity and relative abundance of aquatic invertebrates.

Electroshocking of fish was also conducted during this study. Sampling efforts at Pottsville (Schuylkill River) and Port Clinton (Little Schuylkill River), resulted in no fish being captured. Fish populations did not start to recover until the river reached Hamburg further to the south.

Pennsylvania Fish Commission personnel reported that there are currently no fish resources in either Mill Creek or that part of the Schuylkill River within the study area. Fishing opportunities on the Little Schuylkill River are also greatly limited, with stocking by local sportsmen providing some recreational fishing in localized areas.

Within the study area the most viable fisheries are located in the unpolluted reservoirs on Broad Mountain, Tumbling Run and associated dams, and Pine Creek. The reservoirs on Broad Mountain contain several warm water game fish such as black bass and sunfish. Fishing is prohibited in these dams. Tumbling Run contains a population of native brook trout and the two dams on Tumbling Run are inhabited by a variety of warm water game fish. One of the best trout streams in the study area is Pine Creek. The water supply

for this stream comes from Second Mountain and is of good quality.

Endangered and Threatened Species

Vegetation

None of the plant species proposed to be included under the Endangered Species Act of 1973 as endangered for Pennsylvania have been recorded in Schuylkill County. Two of these proposed species, small whorled pogonia and spreading globe-flower, may potentially occur in the county. An additional group of plant species are presently under review for possible inclusion in the Endangered Species List of 1973. One of these species, a rush, has been collected in the study area on Broad Mountain south of Frackville. Although many of these collections were made in the 19th Century, recent collections have been made also. These recent collections are from the stations in St. Clair and on Second Mountain west of Cressona. This species commonly occurs in wet woods, open boggy situations, sphagnum swamps, and peaty margins of mountain streams.

Presently there is no official list of endangered or threatened plant species recognized by the Commonwealth of Pennsylvania.

Fish and Wildlife

Based on distribution information and habitat preferences, it is unlikely that any endangered fauna inhabit the study area. The Pennsylvania Fish Commission lists five species of fish as threatened or endangered in Pennsylvania. Of these, several are restricted to Lake Erie. The likelihood of any of the remaining species existing in the study area is low due to the extremely poor water quality.

The Pennsylvania Fish Commission also lists five species of amphibians and six species of reptiles as threatened or endangered. Only the bog turtle could possibly occur within the study area. The distribution of the other species in Pennsylvania is very limited and does not include Schuylkill County. Preferred habitat of the bog turtle is sphagnum bogs, swamps, and clear, slow-moving meadow streams with muddy bottoms. Based on this description, suitable habitat within the study area is very limited and probably restricted to some of the unpolluted streams in the southern portion of the study area.

The Pennsylvania Game Commission lists the following bird and mammal species as endangered in the state: Indiana bat,

bald eagle, peregrine falcon, Kirtland's warbler, and Delmarva fox squirrel. The study area does not represent permanent habitat for any of these species. The bald eagle and peregrine falcon pass near the area, mostly along Blue Mountain, during their fall migration but are not permanent or breeding residents.

There are no established natural areas or environmentally unique areas within the study area. A few areas considered important from a natural features standpoint include wetlands, reservoir watershed areas, and important waterfowl areas.

Map 8 - Land Use (Existing and Proposed)

Existing and proposed land uses are important in transmission line siting. Each type of land use activity varies in the significance of impact from a transmission line. Land uses are mapped (1) to provide an understanding of the wide variety of land activities found in the study area; and (2) to evaluate the impact of a transmission line upon them.

With respect to impact from a transmission line, the study area's major land uses are developed areas, strip-mine, agriculture, and public lands used for recreation or for reservoirs. These land use categories are described on Map 8.

Developed areas include (1) older densely populated communities, such as the City of Pottsville, the Boroughs of Frackville, Saint Clair, Cressonia, Port Carbon, Orwigsburg, Schuylkill Haven and Minersville; (2) suburbanizing townships located adjacent to the older communities; and (3) scattered rural development.

Most of the strip-mine areas are located south of Frackville, between Broad and Sharp Mountains. The remaining strip-mine areas lie north and southeast of Frackville. As noted previously, Map 6 provides a further clarification of strip-mine areas with respect to status.

Agricultural lands (cropland, pasture and specialty farms) occur primarily in the southern portion of the study area, southwest of Cressona and south of Second Mountain near Orwigsburg. Some of the best agricultural land lies east of Orwigsburg.

Most of the agriculatural land is used to raise corn, small grains, hay, and potatoes. Interspersed among the croplands are tracts of inactive cropland and some permanent pasture

land. Specialty farming includes horse farms, mink ranches, and orchards.

Public land uses consist of state gamelands and municipal reservoirs. All the state gamelands are located in the southern portion of the study area. Second Mountain has two gamelands and one lies between Schuylkill Haven and Landingville. The study area has ten municipal reservoirs. One reservoir is located on Ashland Mountain, seven on Broad Mountain, and two on Sharp Mountain.

The significant land uses proposed in the study area are also shown on Map 8. They include (1) a shopping mall and an industrial park located adjacent to the Frackville Interchange of Interstate 81; (2) a county park, Pokey Dam, located in North Manheim Township; and (3) scattered residential, mobile home, and commercial/industrial subdivisions.

Existing land use data were determined through photo interpretation and field surveys. Proposed land use data were derived from conversations with personnel from Schuylkill County Planning Commission and other county departments.

Map 9 - Zoning

Local zoning is an indicator of the type and the location of future community development.

The multitude of local zoning districts have been grouped into ten zoning categories as shown on Map 9. Appendix D correlates local zoning classifications with those shown on Map 9.

The majority of the lands in the northern portion of the study area are zoned mining, conservation and industrial. Most of the zoned lands in the southern portion reflect the influence of farming and are either designated residential-agriculture or agriculture.

Map 10 - Recreation and Scenic Areas

There are numerous recreation and open space areas within the study area, many of which are owned by the state. State Gameland No. 222, located north of McKennsburg on the eastern edge of the study area, contains 821 acres. It is used for hunting, picnicking, cross-country skiing, and sledding. The other, State Gameland No. 286, is located between Schuylkill Haven and Landingville and contains 457 acres and 2.5 miles of streams. It is used for game management and outdoor

recreation. A State Forest is located on Second Mountain in the western portion of the study area. It covers 2,034 acres and is used for outdoor recreation.

The locations of smaller-sized outdoor recreation areas and indoor recreation facilities are also shown on Map 10. These facilities include golf courses, stadia, amusement parks, drive-in-theaters, public parks located in built-up areas, and rifle/skeet shooting.

Important water bodies used for recreation are Whipoorwill Dam and Auburn Dam. Whipoorwill Dam, located east of Frackville, covers six acres and is used for fishing. Auburn Dam, located on the southern edge of the study area is used for boating, fishing and picnicking. Deer Lake was once used for recreation, but now is silt-laden and unusable.

Steep, forested slopes and forested ridges constitute the scenic areas designated on Map 10. They consist of most of the land located on Broad, Sharp and Second Mountains and on the uplands lying at lower elevations in the extreme southern edge of the study area.

Planning and recreation publications, COWAMP maps and photo interpretation were used to gather information about recreation and scenic areas.

Map 11 - Visual Exposure

Map 11 shows the extent to which lands are open to view from built-up areas and major highways. A transmission line crossing these areas would also be visible from them. Physiographic features, another component of visibility, are also shown on Map 11. High points and ridge lines have potential visual impact because they provide extended views both of the transmission line right-of-way and structures placed across them.

The areas open to view from high-traffic volume highways were classified as either high, medium or low exposure.

High exposure areas are located up to one-quarter of a mile from a highway; moderate exposure areas from one-quarter of a mile to three-quarters of a mile; and low exposure areas beyond three-quarters of a mile.

High and moderate traffic volume highways are designated on Map 11. High-traffic volume roads carry more than 10,000 vehicles per day. Interstate 81, US Route 209 between State Route 61 and Mar Lin, a short section of State Route 901

near Minersville, and State Route 61 between Gilberton and Deer Lake are high-traffic volume roads.

Moderate-traffic volume roads carry between 3,000 to 10,000 vehicles per day. Moderate-traffic volume roads include State Routes 183, 443, 901, 895, US Route 209 between State Route 61 and Middleport, the road through Seltzer City connecting Pottsville and Minersville, and the road between Minersville and Buckley.

Viewsheds from built-up areas and major highways were determined from USGS topographic maps, aerial photo interpretation and field surveys. Traffic volume data were obtained from the Pennsylvania Department of Transportation.

Map 12 - Cultural Resources

Map 12 locates two sites listed on the National Register of Historic Places, both of which are located in Pottsville. They are the John O'Hara House and the Cloud House. An archaeological site near Adamsdale has the possibility of being placed on the National Register of Historic Places.

Also shown are those historic sites listed in the Pennsylvania Inventory of Historic Places and those local sites not currently listed but which may be listed in the future. Appendix E lists all these types of historic sites located within the study area.

An archaeological survey was done for the Frackville-Orwigsburg study area as part of the cultural resources inventory.

Map 12 indicates the sensitivity of areas based on the presence of known prehistoric and historic remains. The very sensitive areas contain known prehistoric and historic remains. These very sensitive areas consist mostly of valleys of streams flowing into the Schuylkill River and its larger tributaries. There is a high sensitivity area located on Broad Mountain, just north of Saint Clair.

Moderately sensitive areas consist of historic settled areas which developed along the narrow floodplains of the Schuylkill River, the West Branch of the Schuylkill and Mill Creek.

ENGINEERING DATA

The following criteria were used for selection and evaluation of each alternative route in the categories of Right-of-Way, Construction, and Maintenance.

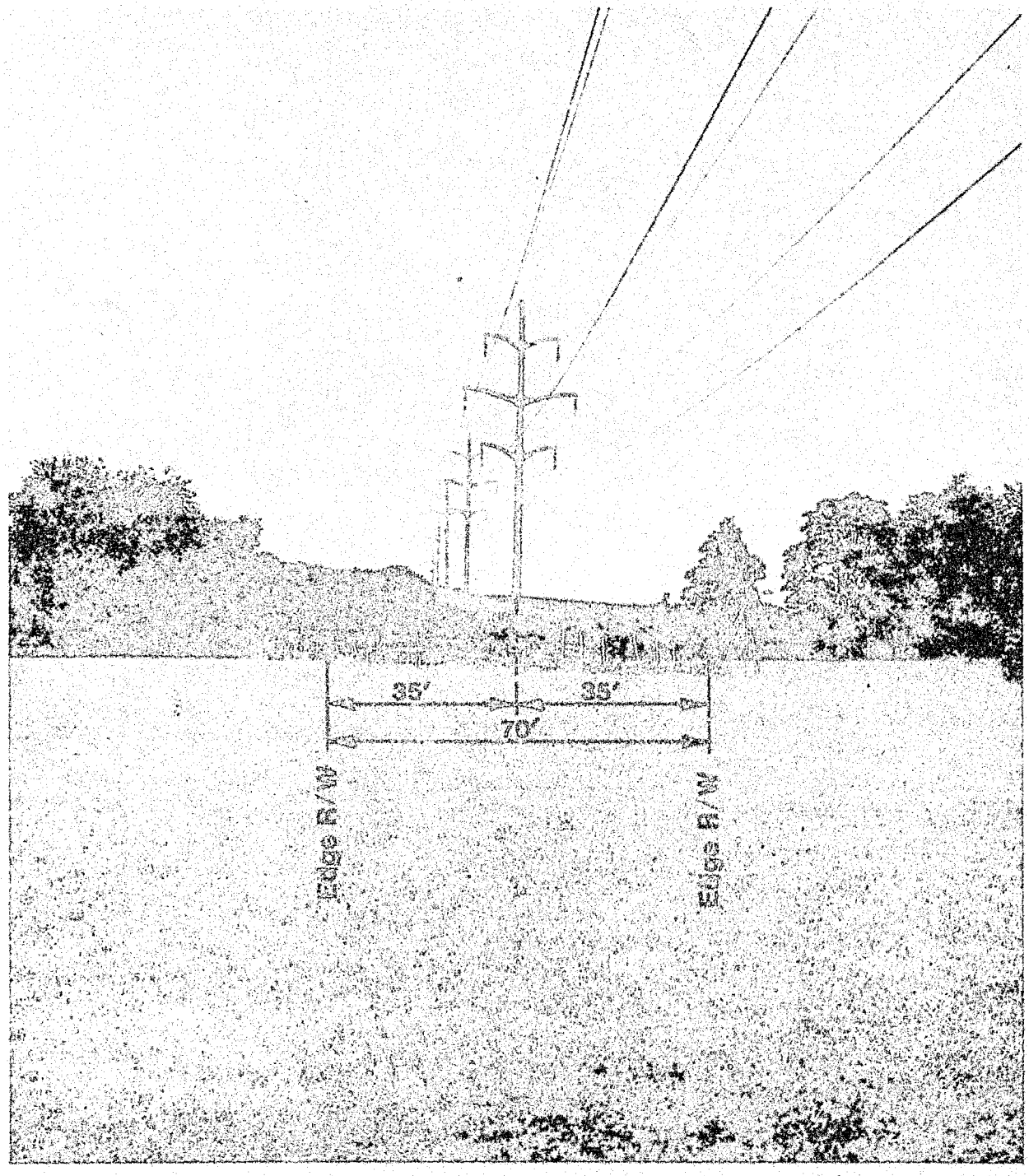
Right-of-Way Widths:

- In cleared fields and open areas, 70 feet of right-of-way is required for a 138 kV line (Figure 1, Page 27).

- In vegetated areas, 100 feet of right-of-way is required (Figure 2, Page 28).

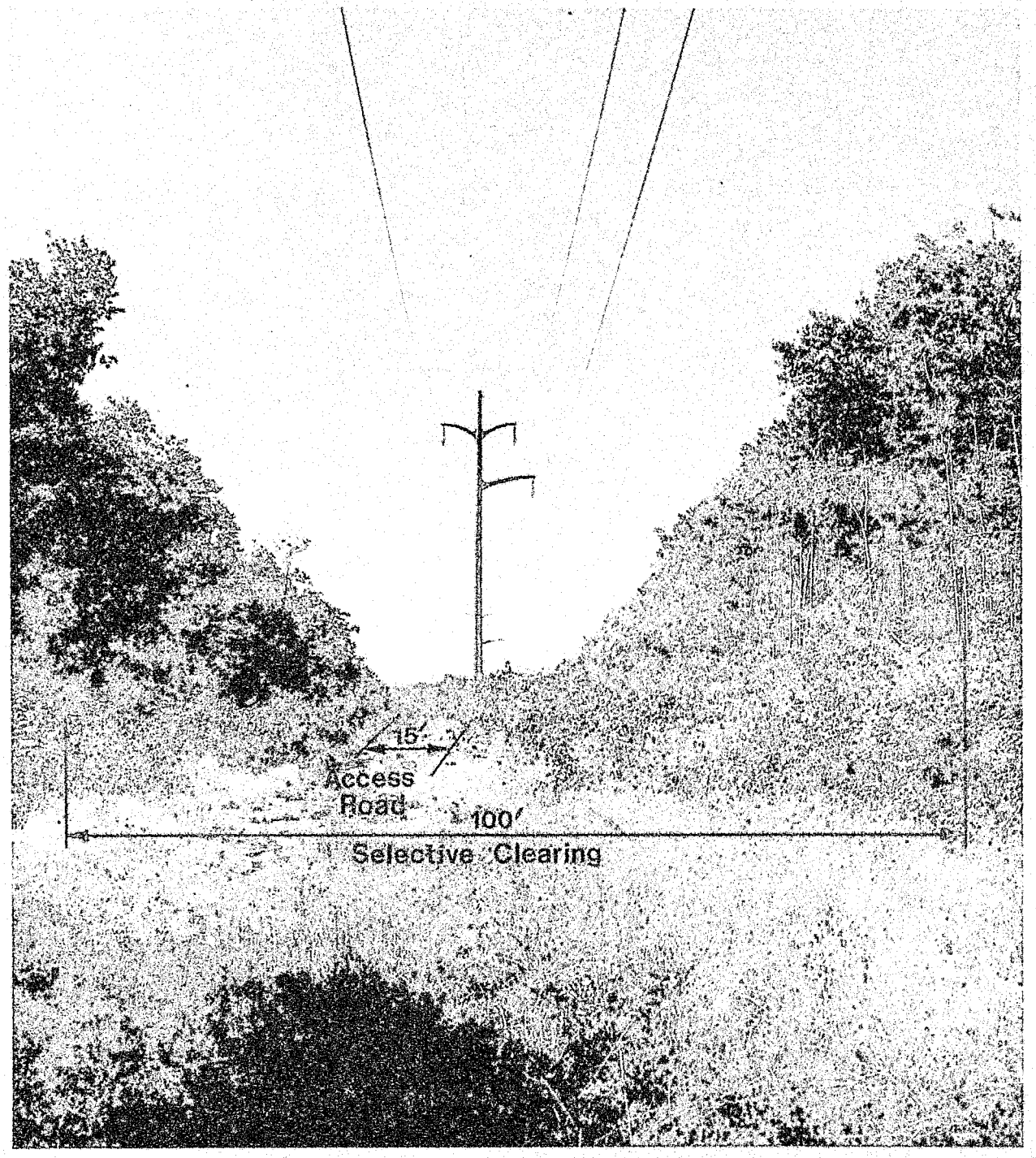
The 70 foot and 100 foot right-of-way widths are standard widths used for 138 kV designed lines. For the type structures and conductors used in this project, the minimum distance required on either side of the transmission centerline is 35 feet. In vegetated areas, to avoid tree contacts with the line, an additional 15 feet of right-of-way is required on both sides of the centerline.

In this project, some segments use abandoned Railroad Right-of-Way and parallel Railroad corridors for transmission line Right-of-Way. Seventy foot and 100 foot widths are required. The Railroad Right-of-Way will constitute most of the width (Figure 3, Page 29).



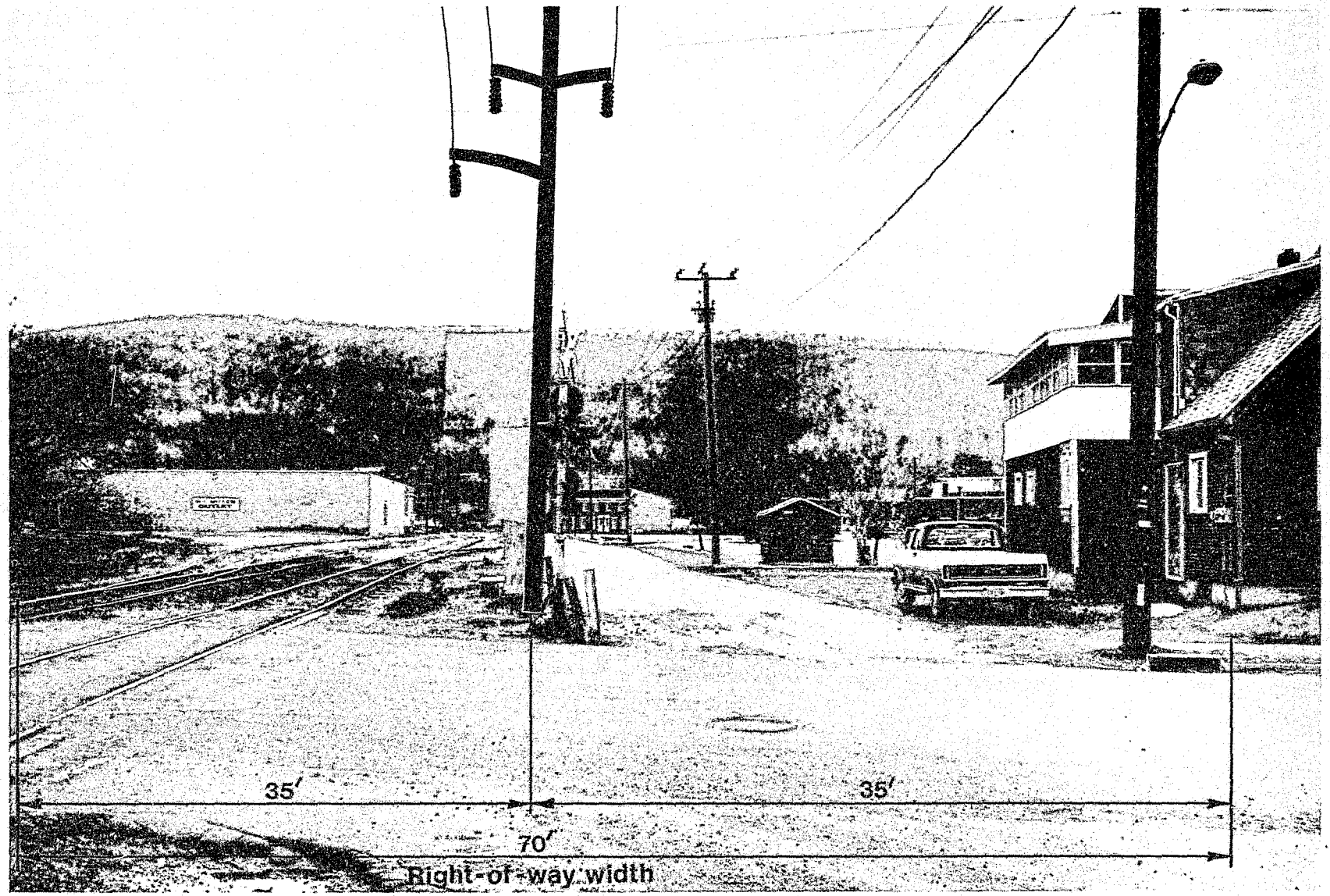
RIGHT-OF-WAY CROSS SECTION-
OPEN LAND AREA

FIGURE 1



**RIGHT-OF-WAY CROSS SECTION-
WOODED AREA**

FIGURE 2



**RIGHT-OF-WAY CROSS SECTION-
RAILROAD AREA**

FIGURE 3

CONSTRUCTION

Evaluation of routes based on construction costs involved clearing vegetation, building access roads, and constructing the transmission line.

The extent of vegetation clearing and access roads are influenced by the natural environment. Little or no clearing is needed in open areas or cleared fields, and road building is not required through agricultural fields.

In wooded or forested areas a 100 foot strip is selectively cleared and cutting of danger timber in mature forest areas is often necessary. Access roads, where required, are graded and seeded, per PP&L's Soil Erosion and Sedimentation Specifications.

Additional construction cost was included for clearing and road building in rough terrain and steep slope areas.

All clearing is done in accordance with PP&L's Program for Vegetation Management and road building per Soil Erosion and Sedimentation Control on Transmission Line Right-of-Way.

Evaluating construction costs and impacts on each segment also required determining the number of structures, type of structure, and the cost involved in erecting the structure. Segments paralleling a railroad corridor may require more angle structures to follow the sweeping curves of the rail. And when a segment crosses rough terrain, bedrock, flood prone areas, wetlands, or steep slopes, additional costs for structure erection were included.

Maintenance

Maintenance costs were calculated for two categories: Line Maintenance and Right-of-Way Maintenance (clearing).

PRELIMINARY ROUTE SELECTION

Environmental Inventory Maps 1 through 12 were used to generate alternate line segments. Because of the predominance of linear corridors (railroads, transmission lines, unoccupied rights-of-way, highways) and their locations in relation to the beginning and end points of this project, initial segment selection was started by using the Linear Features Map #1.

In the western portion of the study area (refer to Map 1), there is an unoccupied PP&L Right-of-Way and a railroad corridor following the West Branch of the Schuylkill River cutting through Sharp and Second Mountains. In the center of the study area there is a second railroad corridor which starts in the Broad Mountain area and extends south beyond Second Mountain following the Schuylkill River. To the east is an existing PP&L transmission line over Broad Mountain, that could be rebuilt, and additional unoccupied PP&L Right-of-Way northeast of Saint Clair Borough.

Initially, 33 line segments were selected for possible use as line routes. Each of the segments were evaluated using each inventory map. Many segments were eliminated for several reasons, among them:

- Shorter line segments accomplished the same result.
- Too much of a segment crossed environmentally difficult areas: very steep slopes, bedrock, etc.
- Excessive construction cost could be avoided.

After completing the environmental evaluation of these segments and combining segments, only seven line segments were considered for further review. These segments were arranged into three preliminary routes as follows:

- An Eastern Route (Segments A-B-D-F) 11.6 miles
- A Railroad Route (Segments A-C-E) 11.4 miles
- A Western Route (Segment W) 12.2 miles

Tables I, II and III (Pages 33-36) contain the environmental impacts and initial project cost tabulations for the three preliminary routes.

The Western Route was eliminated because it had the greatest impact. The Western Route is the longest, and it parallels an active railroad with communication lines for nearly 18,000 feet. This would require rebuilding the communication line to eliminate the electromagnetic

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The Western Route was eliminated because it had the greatest impact. The Western Route is the longest, and it parallels an active railroad with communication lines for nearly 18,000 feet. This would require rebuilding the communication line to eliminate the electromagnetic

influence created by the 138 kV transmission line. The Western Route traverses 19,000 feet of extractive areas and 40% of this distance is on strippable coal lands. There are 12 stream crossings along the Western Route with 10,600 feet being in public watershed lands. The Western Route is also the most visible from highways and crosses more highly sensitive archaeological areas than either the Eastern or Railroad Routes.

Examining Tables II and III shows the Western Route requires more new Right-of-Way and initial clearing, thus contributing to the higher initial project cost of approximately $3,100,000, as compared to the Eastern ($2,600,000) and Railroad ($2,800,000) Routes.

The Western Route does not improve the area's electrical reliability as much as the Eastern and Railroad Routes. The Eastern and Railroad Routes reduce the exposure on the transmission taps now supplying the Port Carbon and Orwigsburg Substations.

The two remaining preliminary routes were evaluated further with respect to environmental and economical impacts.

TABLE I.

ENVIRONMENTAL REVIEW - PRELIMINARY ROUTES

Inventory Map Main Category	Units	Eastern Preliminary Route (Seg. A-B-D-F)	Railroad Preliminary Route (Seg. A-C-E)	Western Preliminary Route (Seg. W)	Preliminary Route With Greatest Impact Per Category
Distance	FT. (MI.)	61,400 11.6	60,200 11.4	64,400 12.2	Western Route
Linear Features:					
Parallel to R/R					
Active	FT.	0	16,800	17,960	Western Route
Inactive	FT.	0	21,600	1,850	Railroad Route
Rebuild Line (Hauto-Frackville #1)	FT.	19,300	14,800	0	Eastern Route
Existing PP&L R/W - Vacant (uncleared)	FT.	3,600	0	12,950	Western Route
Land Use:					
Developed	FT.	1,100	23,600	6,600	Railroad Route
Strip Mine (% Strippable)	FT.	20,500 (5%)	3,900 (41%)	19,000 (40%)	Western Route
Agricultural	FT.	2,200	0	1,600	Eastern Route
Public (Watershed)	FT.	5,300	0	10,600	Western Route
Visual Features:					
Major Highway Exposure	FT.	7,700	33,000	35,100	Western Route
Road Crossings					
High Volume	#	1	5	2	Railroad Route
Moderate Volume	#	1	2	2	Railroad and Western Routes
Ridge Crossings	#	3	0	2	Eastern Route
Cultural Resources:					
Arch. High Sensitivity	FT.	0	800	6,100	Western Route

TABLE I (Cont'd)

ENVIRONMENTAL REVIEW - PRELIMINARY ROUTES

Inventory Map Main Category	Units	Eastern Preliminary Route (Seg. A-B-D-F)	Railroad Preliminary Route (Seg. A-C-E)	Western Preliminary Route (Seg. W)	Preliminary Route With Greatest Impact Per Category
Arch. Medium Sensitivity	FT.	500	33,000	12,800	Railroad Route
Natural Features:					
Water Bodies	#	0	0	1	Western Route
Streams					
Crossings	#	7	6	12	Western Route
Parallel	FT.	0	27,500	21,200	Railroad Route
Wooded Area	FT.	44,400	23,800	37,700	Eastern Route
Reservoir Watershed	FT.	5,300	0	10,600	Western Route
Soils/Slopes:					
Bedrock less than 4 ft.	FT.	30,400	26,400	28,600	Eastern Route
Flood Prone	FT.	700	16,500	19,000	Western Route
Erodible Soils	FT.	300	0	0	Eastern Route
Very Steep Slopes 25+%	FT.	6,300	2,200	2,500	Eastern Route
Steep Slopes 15-25%	FT.	18,300	7,300	8,700	Eastern Route

TABLE II

RIGHT-OF-WAY, ACCESS ROADS AND CLEARING REQUIREMENT - PRELIMINARY ROUTES

Inventory Map Main Category	Units	Eastern Preliminary Route (Seg. A-B-D-F)	R/R Preliminary Route (Seg.A-C-E)	Western Preliminary Route (Seg. W)	Preliminary Route With Greatest Impact Per Category
Right-of-Way					
35-50 ft. Strip	AC.	0	16.6	22.7	Western Route
70 ft. Strip	AC.	13.1	0	7.0	Eastern Route
100 ft. Strip	AC.	68.4	62.5	56.7	Eastern Route
Existing R/W	AC.	52.0	32.2	34.3	Eastern Route
Railroad Rental	AC.	0	16.6	20.3	Western Route
Total R/W	AC.	133.5	127.9	141.0	Western Route
Total New R/W	AC.	81.5	95.7(1)	120.7	Western Route
Roads					
Off-R/W Access	MI.	*	*	*	All Routes
Along R/W Access					
Sloped	MI.	3.2	0.6	1.0	Eastern Route
Level	MI	3.4	3.8	6.6	Western Route
Total Roads	MI.	7.6	4.4	7.6	Eastern and Western Routes
Clearing					
35-50 ft. Width	AC.	0	10.5	24.8	Western Route
70 ft. Width	AC.	12.5	32.7	7.0	Railroad Route
100 ft. Width	AC.	71.9	12.9	86.6	Western Route
Total Clearing	AC.	84.4	56.1	118.4	Western Route

(1) Does not include 12.4 acres to be purchased along with abandoned R/R not required for R/W.

* Required and included as lump sum of dollars.

TABLE III

ITEMIZED CONSTRUCTION COSTS - PRELIMINARY ROUTES

	Eastern Preliminary Route (Seg. A-B-D-F)	Railroad Preliminary Route (Seg.A-C-E)	Western Preliminary Route (Seg. W)	Preliminary Route With Greatest Impact Per Category
Right-of-Way	$ 326,000	$ 408,000	$ 392,400	Railroad Route
Roads	70,500	24,900	57,100	Eastern Route
Clearing	170,200	114,100	229,700	Western Route
Crossing Protection (and associated switching)	54,000	93,600	112,000	Western Route
Construction Base Cost	1,768,700	1,658,200	1,768,900	Western Route
Additions:				
Bedrock (Rock Holes)	53,700	40,500	52,000	Eastern Route
Wet Soils-Flood Prone	700	30,100	5,600	Railroad Route
R/R Communication - Line Reconstruction	0	80,000	272,100	Western Route
Rebuild Lines (incl. removal, rarrangement)	116,000	120,500	20,000	Railroad Route
Steel Poles/Angle Adjustment	-30,000	152,400	128,400	Railroad Route
Rough Terrain	68,200	23,300	25,800	Eastern Route
Initial Project Cost	$2,598,000	$2,745,600	$3,064,000	Western Route

ROUTE EVALUATION

The two remaining routes each have distinct routing characteristics. Although both share Segment A, from that segment, the Railroad Route parallels existing branches or utilizes abandoned railroad beds for its remaining lengths. The Eastern Route establishes a new line corridor for its entire length. To satisfy the project functional requirements, Segment F must be included within the Eastern Route to supply the Fishbach-Pottsville-Port Carbon area via the Port Carbon Tap. Both routes finally terminate on the Orwigsburg Tap. It is also electrically feasible to combine these line segments by interchanging the line segments north of the Port Carbon Tap with the segments south from Port Carbon to the Orwigsburg Tap to generate the following four line route alternatives.

Alternative	Segments	Description	Figure	Page
1	A-B-D-F	Entire Eastern Route	4	39
2	A-C-E	Entire Railroad Route	5	40
3	A-B-F-E	Combines Eastern Segments (N) with Railroad Segments (S)	6	41
4	A-C-F-D	Combines Railroad Segments (N) with Eastern Segments (S)	7	42

On Table IV (Page 43) the environmental impacts of each route have been tabulated. Alternatives 1 and 2 remain the same, as shown on Table 1 (Page 33), and Alternatives 3 and 4 have been tabulated by combining the appropriate segment impacts.

Table V (Page 45) shows the right-of-way, access roads, and clearing requirements for each line route. Table VI (Page 47) is a tabulation of itemized construction costs. Table VII (Page 48) shows the total project costs and major factors from Tables IV, V and VI.

In the route evaluation process the information from these tables, the inventory maps and field reviews were used to determine the preferred route. These segments are shown on Inventory Maps 3-12.

Environmentally, the Eastern Railroad Route (Alternative 3) avoids crossing the Schuylkill Haven Borough Reservoir Watershed but it does cross flood prone land in the Palo Alto area along Segment E. This route is the most expensive to build, $3.9 million. This high cost results from paralleling active and inactive railroad lines along Segment E, which involves more line angles and also conflicts with

railroad communications. Photos on Page 54 illustrate these areas along Segment E.

Conversely the Railroad-Eastern Route (Alternative 4) is lower economically but affects the most environmental categories as shown in Table IV (Page 43). Its total project cost is $3.7 million, or 5 percent more than the least expensive route. It is the longest route (12.2 miles) and requires acquisition of 106.6 acres of new right-of-way. It has the largest area to be cleared (90.4 acres) and the greatest length of access road construction (8.1 miles).

Therefore, the evaluating of Alternatives 3 and 4 environmentally and economically demonstrate that neither route has any advantages to the originally proposed preliminary Eastern and Railroad Routes.

Alternative No. 1
Eastern Route

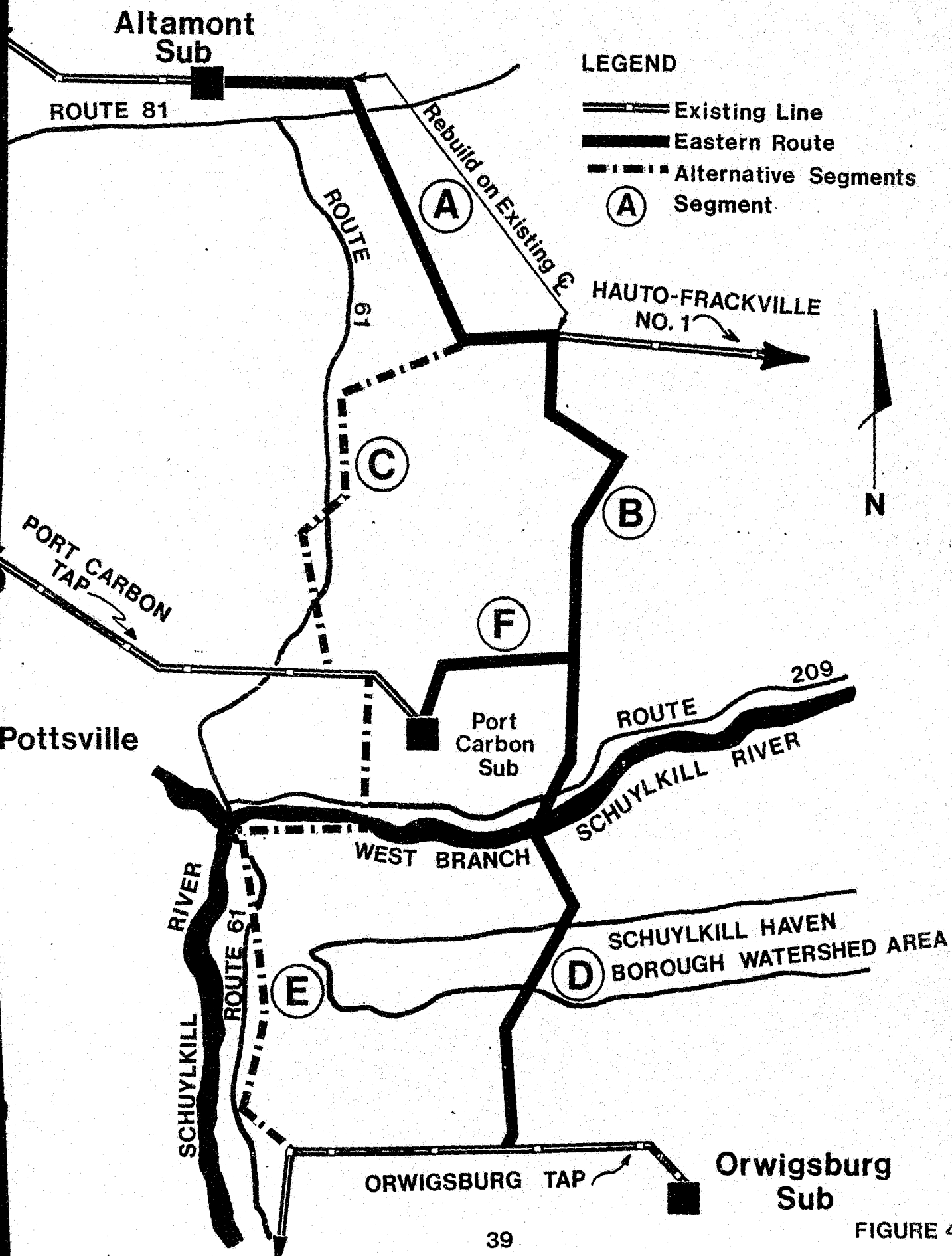


FIGURE 4

Alternative No. 2
Railroad Route

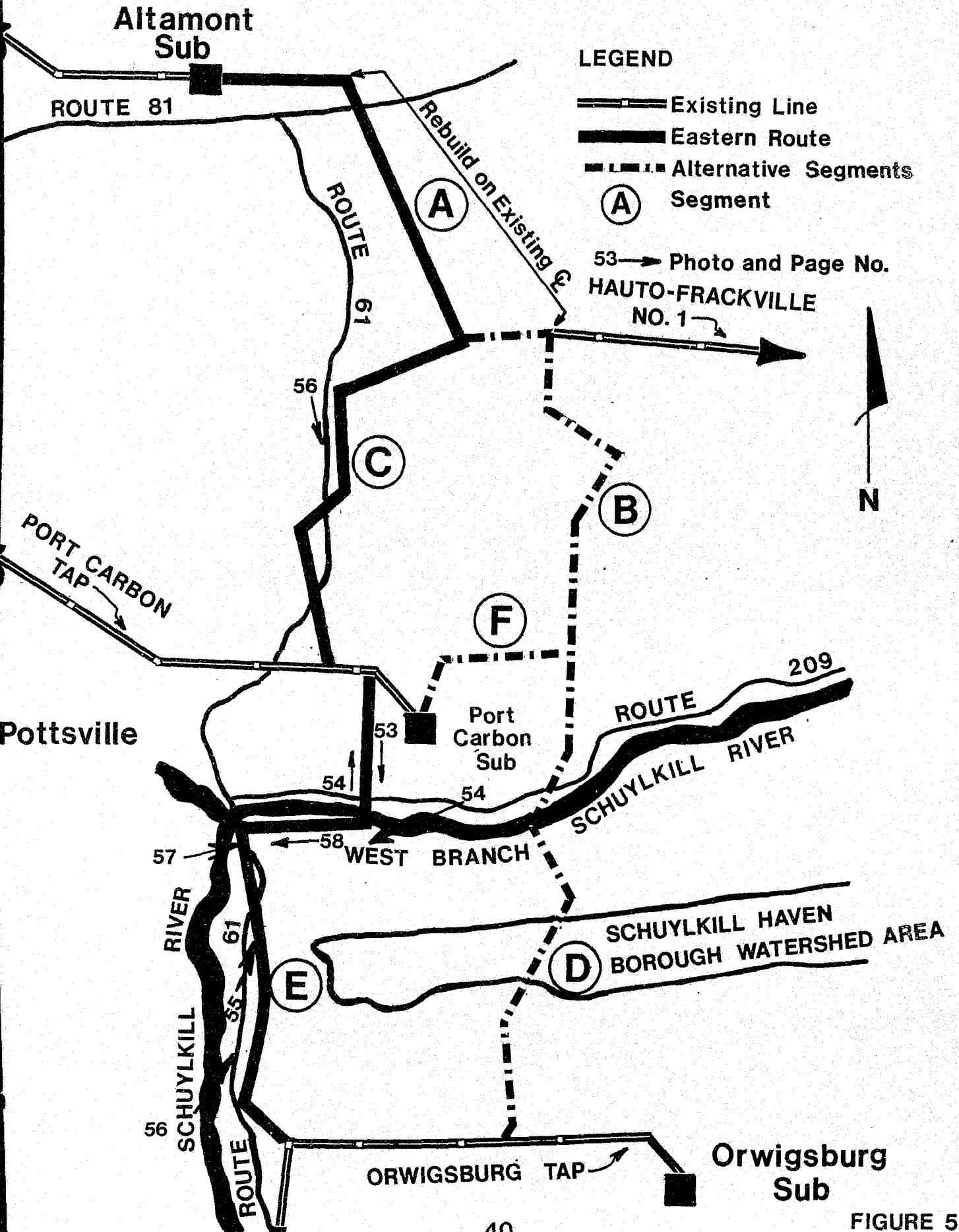


FIGURE 5

Alternative No. 3
Eastern-Railroad Route

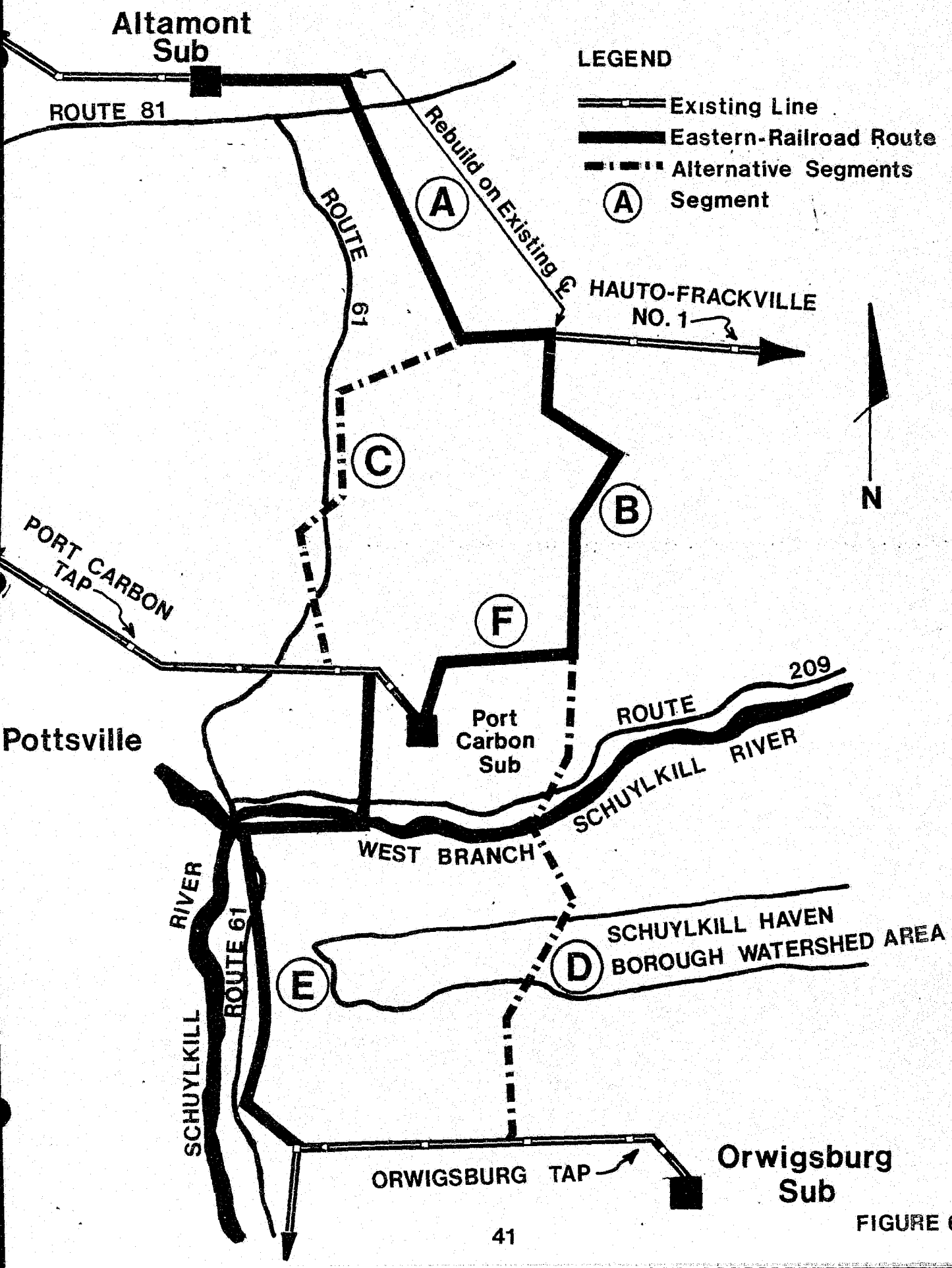


FIGURE 6

Alternative No. 4
Railroad-Eastern Route

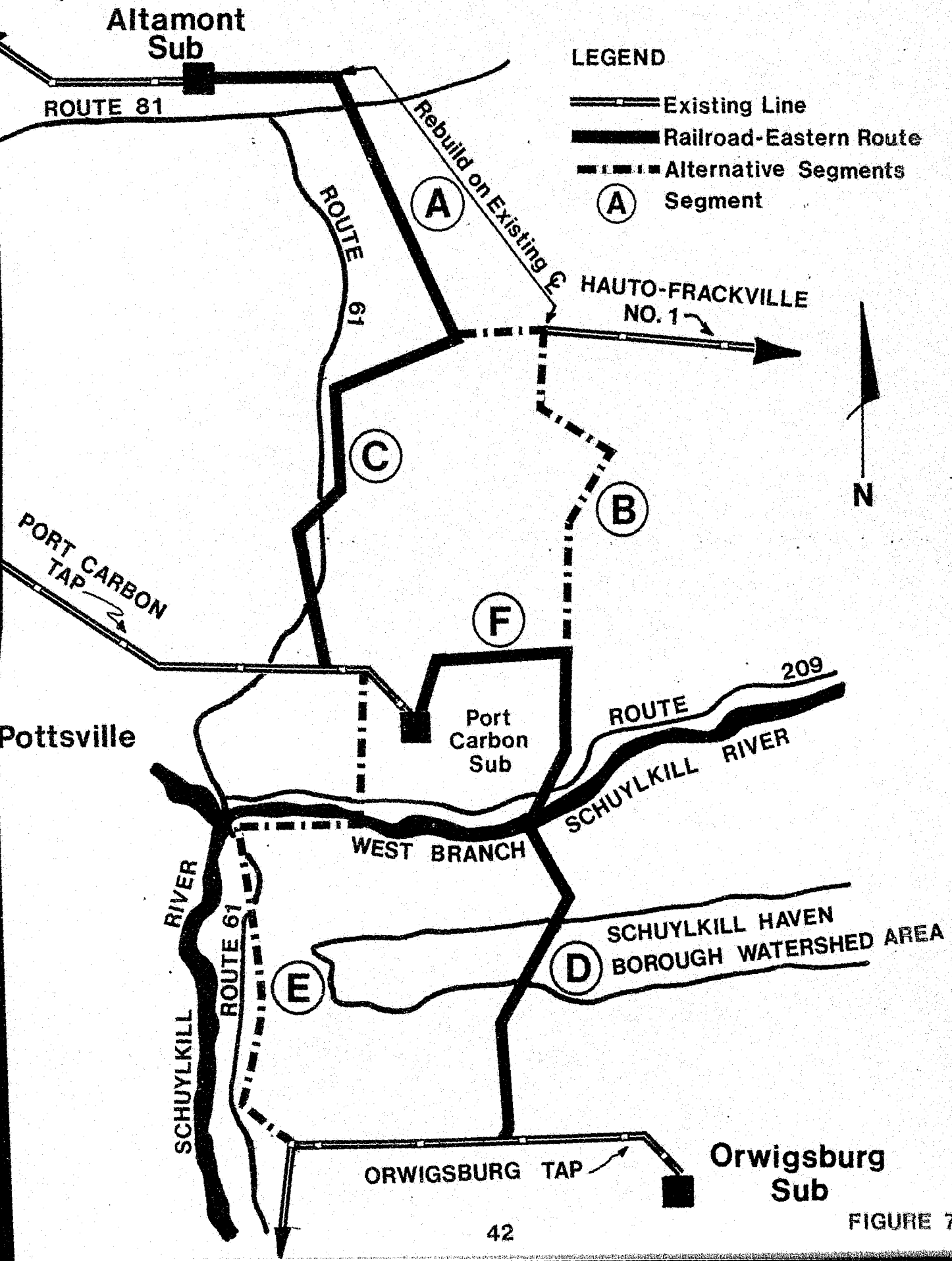


FIGURE 7

TABLE IV

ENVIRONMENTAL REVIEW - ALTERNATIVE LINE ROUTES

Inventory Map Main Category	Units	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Distance	FT. (MI.)	61,400 11.6	60,200 11.4	63,600 12.0	64,600 12.2	Railroad Route
Linear Features:						
Parallel to R/R						
Active	FT.	0	16,800	11,500	5,300	
Inactive	FT.	0	21,600	11,000	10,600	Eastern Route
Rebuild Line (Hauto-Frackville #1)	FT.	19,300	14,800	19,300	14,800	Railroad & R/R - Eastern Routes
Existing PP&L R/W - Vacant (uncleared)	FT.	3,600	0	3,600	0	Railroad & R/R - Eastern Routes
Land Use:						
Developed	FT.	1,100	23,600	13,800	10,900	Eastern Route
Strip Mine (% Strippable)	FT.	21,600 (4%)	5,000 (26%)	15,300 (5%)	17,900 (12%)	R/R - Eastern Route
Agricultural	FT.	2,200	0	1,100	2,200	Railroad Route
Public (Watershed)	FT.	5,300	0	0	5,300	Railroad & Eastern - R/R Routes
Proposed Residential	FT.	1,200	0	1,200	1,200	Railroad Route
Visual Features:						
Major Highway Exposure	FT.	7,700	33,000	23,000	17,700	Eastern Route
Road Crossings						
High Volume	#	1	5	3	3	Eastern Route
Moderate Volume	#	1	2	1	2	All Routes the Same

TABLE IV (Cont'd)

ENVIRONMENTAL REVIEW - ALTERNATIVE LINE ROUTES

Inventory Map Main Category	Units	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Ridge Crossings	#	3	0	1	2	Railroad Route
Cultural Resources:						
Arch. High Sensitivity	FT.	0	800	0	800	Eastern & Eastern - R/R Routes
Arch. Medium Sensitivity	FT.	500	33,060	21,860	11,500	Eastern Route
Natural Features:						
Streams Crossings	#	7	6	7	6	Railroad & R/R - Eastern Routes
Parallel	FT.	0	27,500	19,600	7,900	Eastern Route
Wooded Area	FT.	44,400	23,800	27,700	40,500	Railroad Route
Reservoir Watershed	FT.	5,300	0	0	5,300	Railroad & Eastern - R/R Routes
Soils/Slope:						
Bedrock less than 4 ft.	FT.	30,400	26,400	25,900	30,900	Eastern - R/R Route
Flood Prone	FT.	700	16,500	10,700	6,500	Eastern Route
Wet Soils	FT.	400	1,800	400	2,200	Eastern & Eastern - R/R Routes
Erodible Soils	FT.	300	0	0	300	Railroad & Eastern - R/R Routes
Very Steep Slopes 25+%	FT.	6,300	2,200	2,600	5,900	Railroad Route
Steep Slopes 15-25%	FT.	18,300	7,300	11,600	14,000	Railroad Route

TABLE V

RIGHT-OF-WAY, ACCESS ROADS AND CLEARING REQUIREMENTS - ALTERNATIVE LINE ROUTES

	Units	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Right-of-Way						
35-50 ft. Area	AC.	0	16.6	10.6	6.0	Eastern Route
70 ft. Cleared Area	AC.	13.1	0	9.4	5.8	Railroad Route
100 ft. Wooded Area	AC.	68.4	62.5	52.4	88.8	Eastern - R/R Route
Existing R/W	AC.	52.0	32.2	52.0	33.4	Eastern & Eastern - R/R Route
Railroad Rental	AC.	0	16.6	10.6	6.0	Eastern Route
Total R/W	AC.	133.5	127.9	135.0	140.0	Railroad Route
Total New R/W	AC.	81.5	95.7	83.0	106.6	Eastern Route
Roads						
Off-R/W Access	MI.	*	*	*	*	All Routes the Same
Along R/W Access						
Sloped	MI.	3.2	0.6	1.5	2.6	R/R Route
Level	MI.	3.4	3.8	2.3	5.5	Eastern - R/R Route
Total Roads	MI.	7.6	4.4	3.8	8.1	Eastern - R/R Route

TABLE V (Cont'd)

RIGHT-OF-WAY, ACCESS ROADS, AND CLEARING REQUIREMENTS - ALTERNATIVE LINE ROUTES

	Units	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Clearing						
35-50 ft. Width	AC.	0	10.5	4.5	6.0	Eastern Route
70 ft. Width	AC.	12.5	32.7	25.1	22.2	Eastern Route
100 ft. Width	AC.	71.9	12.9	32.9	62.2	Railroad Route
Total Clearing	AC.	84.4	56.1	62.5	90.4	Railroad Route

TABLE VI

ITEMIZED CONSTRUCTION COSTS - ALTERNATIVE LINE ROUTES

	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Right-of-Way	$ 326,000	$ 408,000	$ 367,500	$ 416,100	Eastern Route
Roads	70,500	24,900	46,300	54,300	Railroad Route
Clearing	170,200	114,100	118,600	190,100	Railroad Route
Crossing Protection (and associated switching)	54,000	93,600	86,400	61,200	Eastern Route
Construction Base Cost	1,768,700	1,658,200	1,822,500	1,792,900	Railroad Route
Additions:					
Bedrock (Rock Holes)	53,700	40,500	39,700	66,000	Eastern - R/R Route
Wet Soils - Flood Prone	700	30,100	18,200	12,600	Eastern Route
R/R Communication - Line Reconstruction	0	80,000	80,000	0	Eastern and R/R - Eastern Routes
Rebuild Lines (incl. removal, rearrangement)	116,000	120,500	116,000	120,500	Eastern and Eastern - R/R Routes
Steel Poles/Angle Adjustments	-30,000	152,400	152,400	-30,000	Eastern and R/R - Eastern Routes
Rough Terrain	68,200	23,300	37,700	58,000	Railroad Route
Initial Project Cost	$2,598,000	$2,745,600	$2,885,300	$2,741,700	Eastern Route

TABLE VII

TOTAL PROJECT COST (INCLUDING MAINTENANCE) - ALTERNATIVE LINE ROUTES

	Alternative #1 Eastern Route (Segment A-B-D-F)	Alternative #2 Railroad Route (Segment A-C-E)	Alternative #3 Eastern - R/R Route (Segment A-B-F-E)	Alternative #4 R/R - Eastern Route (Segment A-C-F-D)	Route With Least Impact Per Category
Initial Project Cost	$2,598,000	$2,745,600	$2,885,300	$2,741,700	Eastern Route
Differential	Base	+147,600	+287,300	+143,700	
Total Distance	11.6 MI.	11.4 MI.	12.0 MI.	12.2 MI.	Railroad Route
New R/W Required	73.3 AC.	97.7 AC.	75.8 AC.	106.8 AC.	Eastern Route
Number of Structures	145	144	152	153	Railroad Route
Number of Poles	167	176	184	179	Eastern Route
Total Present Worth of Line Maintenance for (40 years) life of line	292,000	299,000	315,000	310,000	
Total Present Worth of Right-of-Way Maintenance	286,000	190,000	225,000	272,000	Railroad Route
Levelized Carrying Charges (15.4%)	400,100	422,800	444,300	422,200	Eastern Route
Total Project Cost	$3,576,100	$3,657,400	$3,869,600	$3,745,900	Eastern Route
Differential	Base	+81,300	+293,500	+169,800	

SELECTION OF A PREFERRED ROUTE

The final step of the selection process involves more detailed comparison of the Eastern and Railroad Routes. The environmental impact data of these line routes are shown on Table IV (Page 43) and discussed in this section.

The length of the Railroad Route is 11.4 miles and is shorter than the Eastern Route, which measures 11.6 miles in length.

Linear Features (Map 1)

The Railroad Route parallels 16,800 feet of active railroads and utilizes 21,600 feet of inactive railroad beds (See Photo, Page 58). It will require construction expenditures of approximately $80,000 to ensure proper compatibility with railroad communication lines. The Eastern Route rebuilds an additional 4,500 feet of the existing Hauto-Frackville #1 Line, utilizes 3,600 feet of vacant PP&L right-of-way, and requires 14.2 acres less new right-of-way.

Land Use Impacts (Map 8)

The Eastern Route has the lesser impact, 1100 feet, on developed areas. The Railroad Route passes through 23,600 feet of developed areas (see Photo, Page 53).

The Railroad Route may conflict with two proposed Pennsylvania Department of Transportation projects: the St. Clair-Rt. 61 By-Pass and the Palo Alto-Port Carbon By-Pass plans for both by-passes have been formulated, but both projects are currently inactive. The Photo on Page 54 shows the proposed path of the Palo Alto-Port Carbon By-Pass through the Palo Alto Railroad yards with respect to the proposed Railroad Route crossing.

If the proposed by-passes are constructed, the Railroad alternative will create a visual impact to motorists traveling the roads. The proposed centerline of the Railroad Route does not conflict with either proposed by-pass alignments, but may require the replacement of two-pole guyed angle structures in the future with self-supportive steel poles depending on the final location of the by-passes.

Visual Features (Map 11)

The Eastern and Railroad Routes both cross Interstate 81 east of the Frackville Interchange in the rebuild section of the Hauto-Frackville #1 circuit. The Railroad Route crosses

Route 61 four times (see photo, Pages 55 & 57) and has total major highway visual exposure of 33,000 feet. The Railroad Route utilizes the abandoned railroad bed through the narrow stream valley south of Pottsville paralleling Route 61 and the Schuylkill River, and north of Saint Clair, paralleling Route 61, and Mill Creek. In both areas, the proposed line will have direct visual exposure to motorists travelling Route 61 both north and south, for approximately four miles.

Since the railroad is located in the Boroughs of Saint Clair, Palo Alto, Port Carbon, and the City of Pottsville, and parallels Route 209, the addition of a transmission line along the railroad would create a visual impact on both the communities and motorist. However, the Railroad Route would eliminate the crossing of both Sharp and Second Mountains south of Port Carbon and the Broad Mountain northeast of Saint Clair.

In contrast the Eastern Route has only 7,700 feet of major highway exposure, with 6,100 feet of that total being the rebuilt crossing of the Hauto-Frackville #1 circuit over Interstate 81.

Cultural Resources (Map 12)

The Eastern Route does not cross any highly sensitive archaeological areas. The Railroad Route crosses only 500 feet of such areas north of Saint Clair on the abandoned railroad bed.

Natural Resources (Map 7)

The Eastern Route has seven stream crossings but does not parallel any streams. The Railroad Route has six stream crossings and parallels Mill Creek north of Saint Clair and the West Branch of the Schuylkill, in the vicinity of Palo Alto for approximately 27,500 feet (see Photo Page 56). The distance between the Railroad Route centerline and the streams varies from 100 feet to 400 feet.

The Eastern Route requires the removal of 84.4 acres of vegetation compared to 56.1 acres for the Railroad Route.

The Eastern Route crosses through 5,300 feet of the Schuylkill Haven Borough Reservoir watershed, including 300 feet of erodible soils.

Soils and Slopes (Maps 3, 4, 5)

The Eastern Route crosses 700 feet of flood prone land adjacent to the West Branch of the Schuylkill River south of

Route 209. In contrast, the Railroad Route goes through 16,500 feet of flood prone land adjacent to the West Branch of the Schuylkill on Segment E. The crossing of 700 feet of flood prone land on the Eastern Route will require the setting of one structure within the flood zone. The Railroad Route would require the setting of approximately 43 structures within the flood zone and wet soils areas. Structures located in flood prone areas are installed with special foundations to withstand flooding debris and assure reliability. Although these design and construction costs are factored into the economic analysis, a higher probability of exposure to flood damage on the Railroad Route exists due to the number of structures to be installed within this area.

The Eastern Route crosses 24,600 feet of steeply sloped areas over Broad, Sharp, and Second Mountains, compared to 9,500 feet for the Railroad Route. This length of crossing steep slopes is high on the Eastern Route due to the alignments selected to cross the three mountains. The lines will cross on angles which will ascend the slopes gradually, not straight up and over, to reduce visual exposure and soil erosion potential during access road construction. Since permanent access roads must be constructed on the slopes, this gradual, angular crossing will allow all roads to be constructed with a maximum 2:1 access road slope cutting per the Soil Erosion and Sedimentation Specifications. Common to both routes is 5,800 feet of steep slopes on Segment A. The additional 3,700 feet of steep slopes on the Railroad Route is encountered in connecting the railroad corridor to the Hauto-Frackville #1 Line (Segment C), and connecting the Railroad Route south of Pottsville, paralleling Route 61, to the existing Orwigsburg Twp..

The Eastern Route crosses 30,400 feet of bedrock areas compared to 26,400 feet for the Railroad Route. This results in an additional structure installation cost (rock holes) of $13,200 for the Eastern Route (see Table VI).

In addition to these environmental comparisons, the Railroad Route's total project cost exceeds that of the Eastern Route by $81,300.

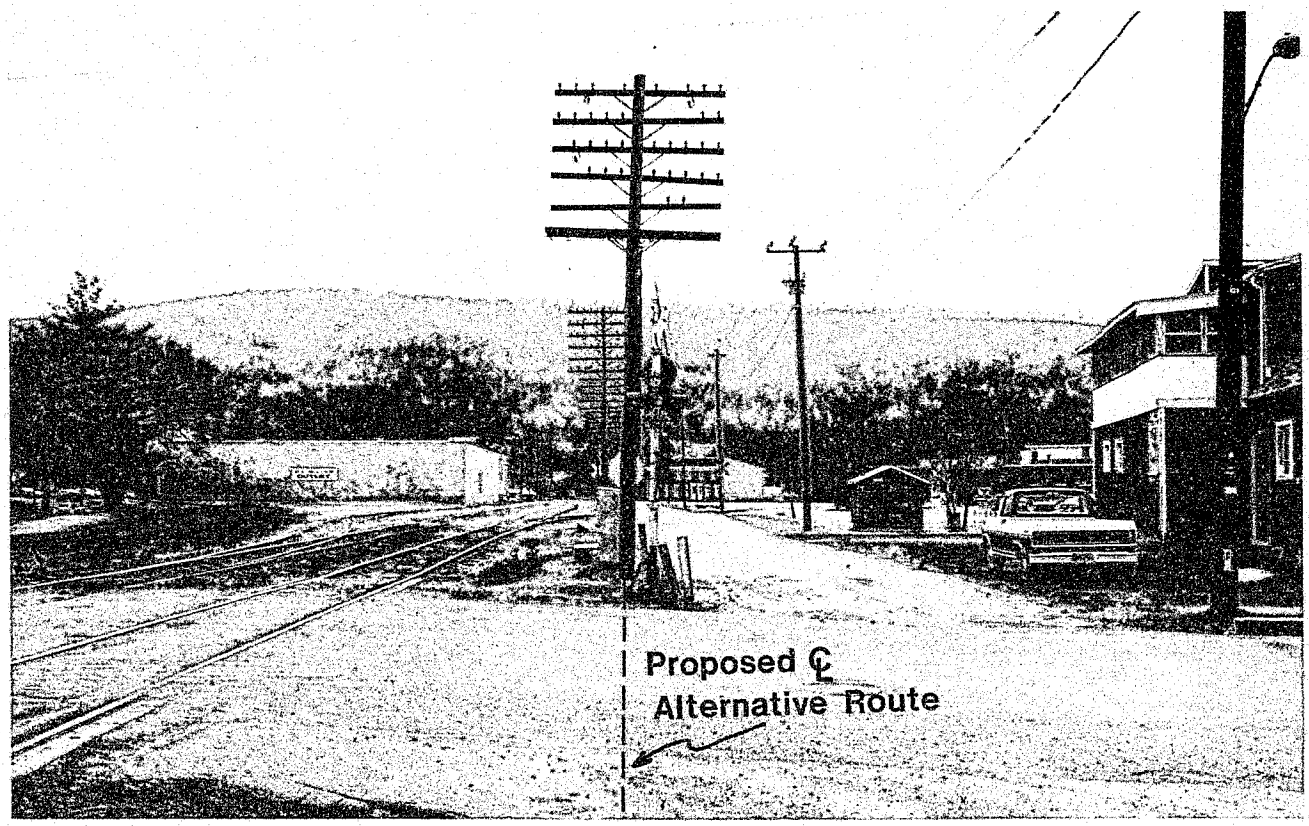
Summary

The utilization of a railroad corridor to locate transmission lines has distinct advantages. Linear features can be combined into common corridors. Although the Railroad Route requires 95.7 acres of right-of-way compared to 81.5 acres for the Eastern Route, approximately 62 acres of new right-of-way for the Railroad Route is now encumbered

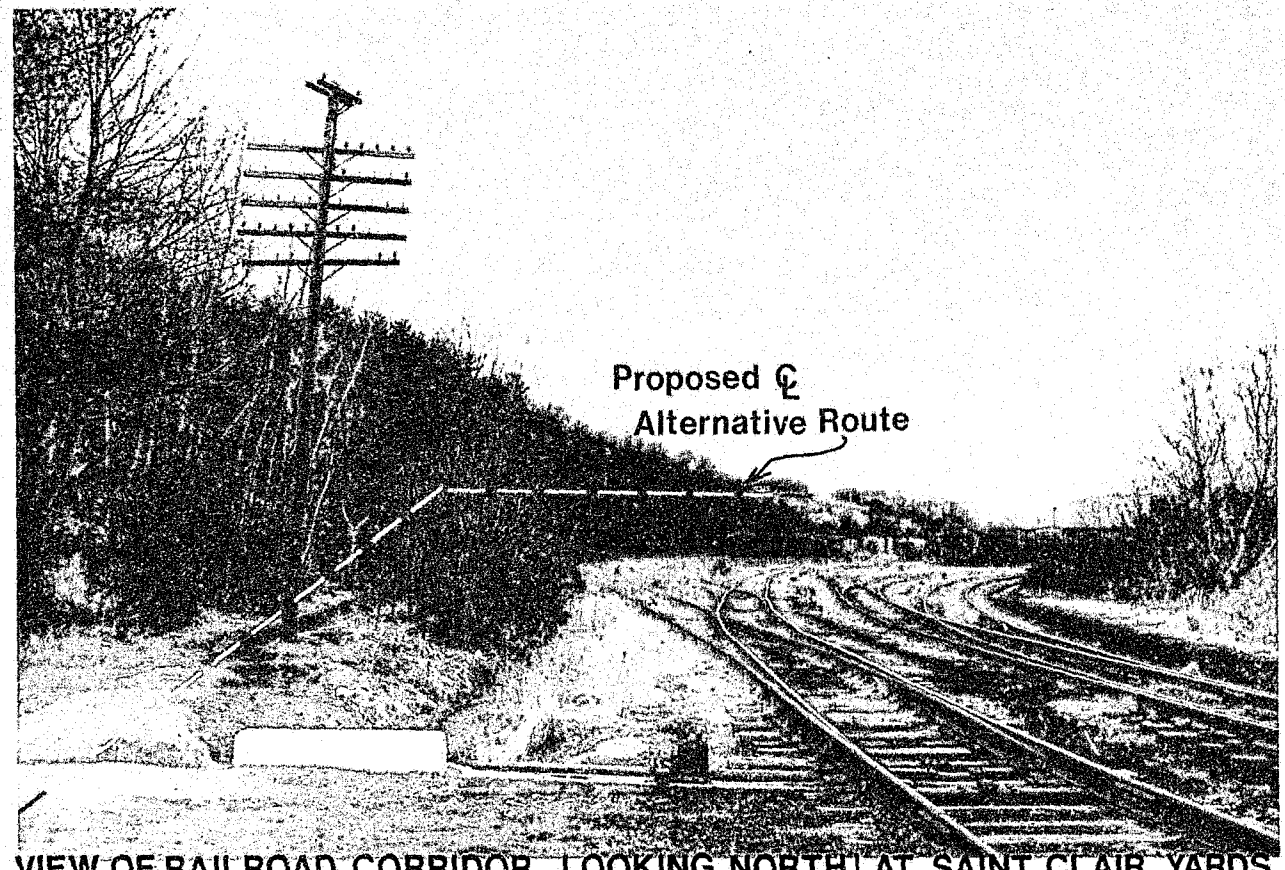
by abandoned railroad beds, thus minimizing land removed for other potential community development. However, the existing location of the railroad does not lessen visual impacts or reduce total construction costs. The railroad's paralleling of Route 61, and the numerous bends to follow natural features and streams, contributes to higher environmental impacts and total construction costs when constructing a transmission line in this location.

The Eastern Route has the lesser visual impact on developed areas, including community and major highway exposure. It has five less major road crossings, avoids all archaeological areas of high sensitivity, has lower impacts in flood prone areas, and has the lowest total project construction cost. Major constraints of the Eastern Route are the watershed and mountain top ridge crossings, steeply sloped areas, and the acres of vegetation clearing required.

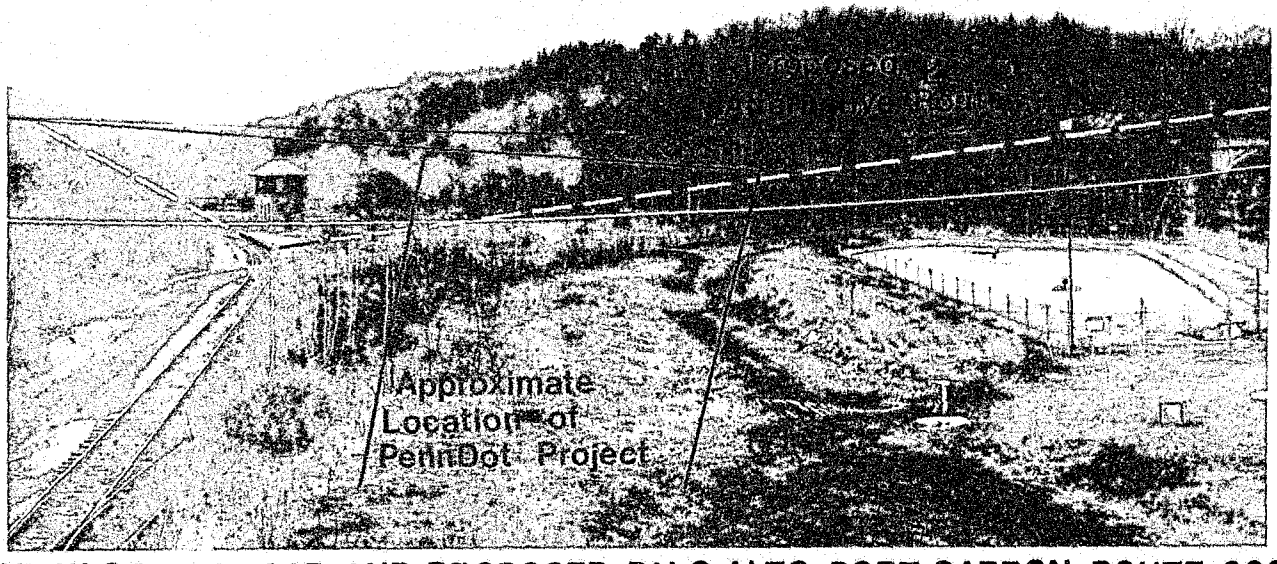
Therefore, PP&L determined that the Eastern Route is the preferable route and proposes this route for certification by the Pennsylvania Public Utility Commission.



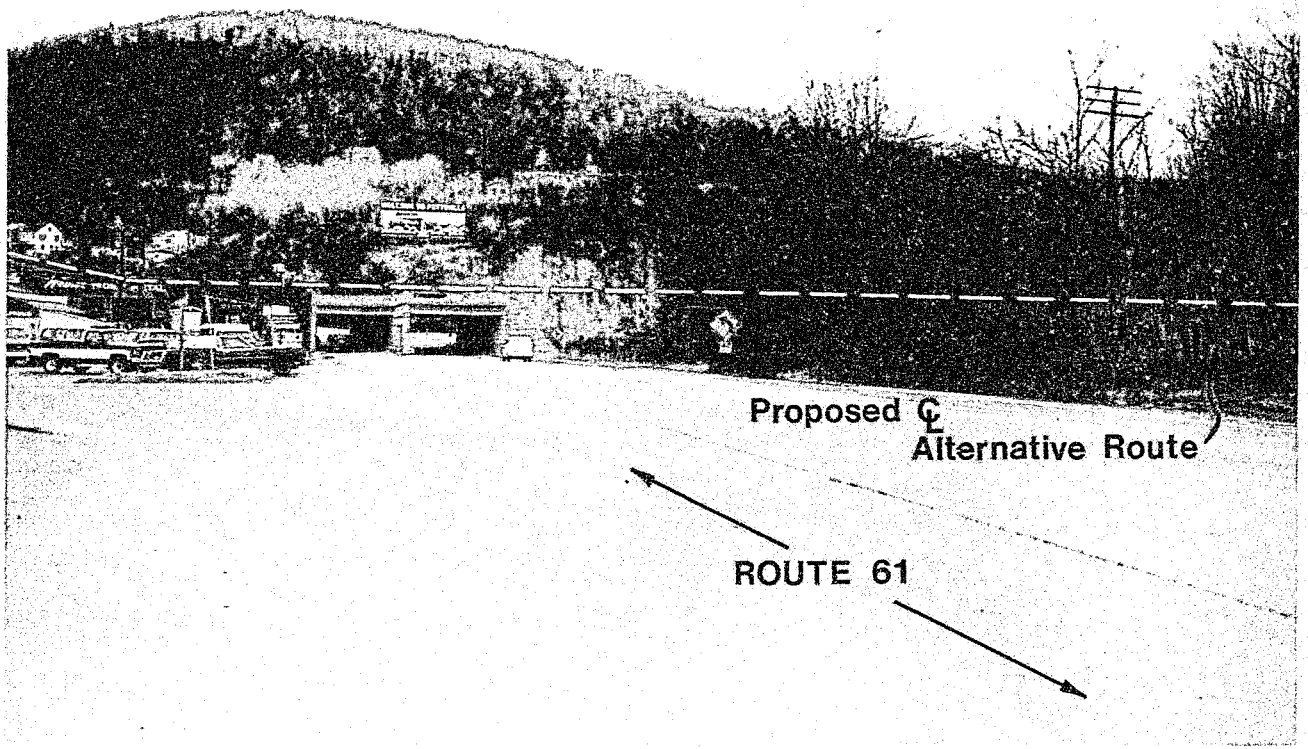
VIEW OF RAILROAD COMMUNICATION LINE IN PORT CARBON [LOOKING SOUTH]. [See Figure 5, Page 40].



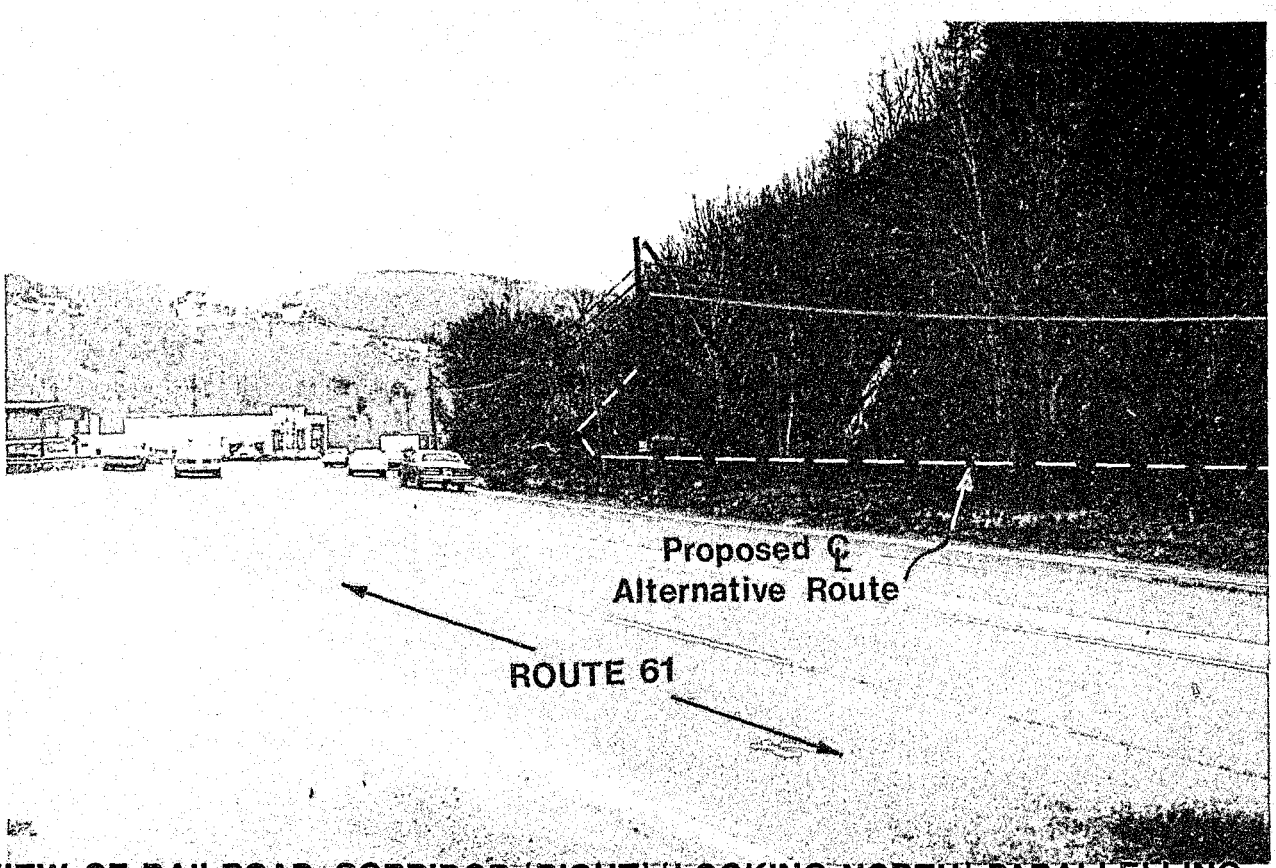
VIEW OF RAILROAD CORRIDOR LOOKING NORTH] AT SAINT CLAIR YARDS SOUTH OF SAINT CLAIR. [See Figure 5, Page 40].



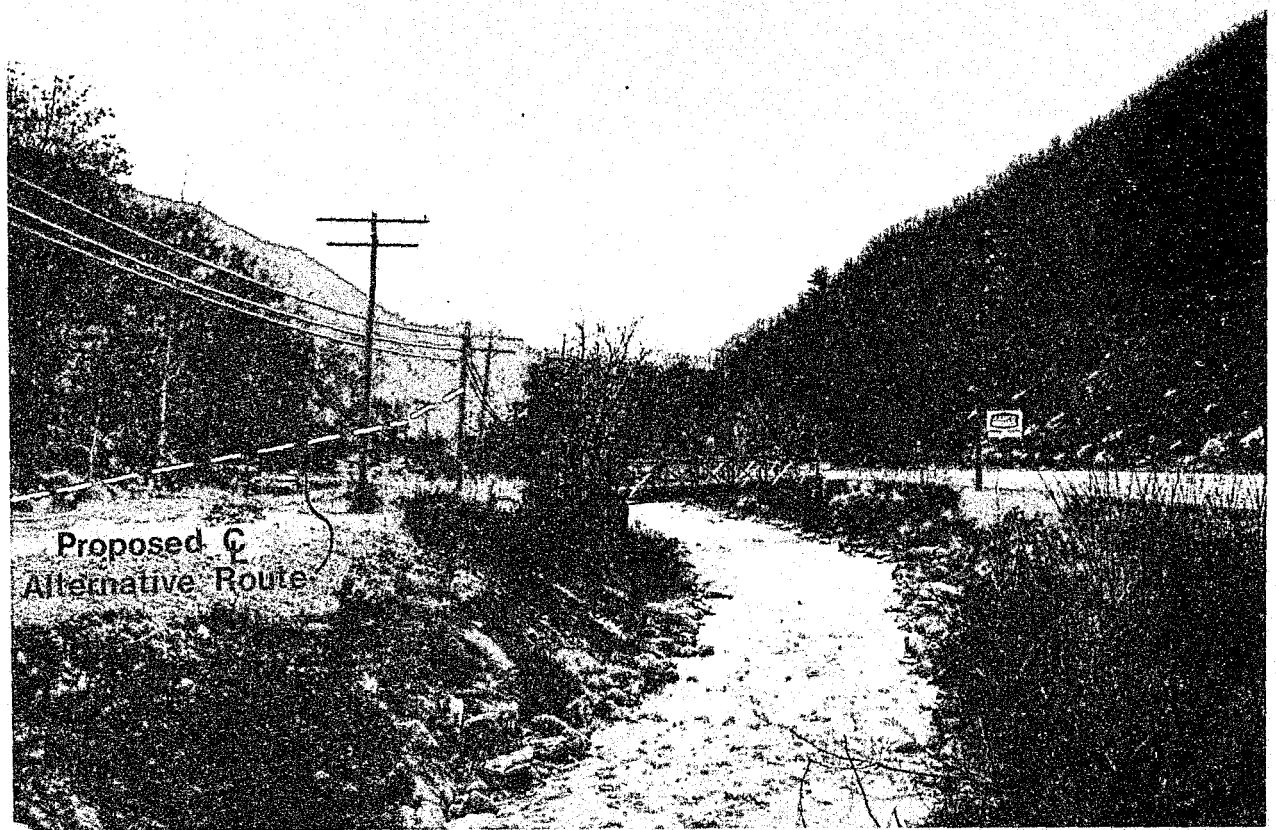
VIEW OF RAILROAD AND PROPOSED PALO ALTO-PORT CARBON ROUTE 209 BYPASS CORRIDORS [LOOKING WEST] BETWEEN PALO ALTO AND SAINT CLAIR. [See Figure 5, Page 40].



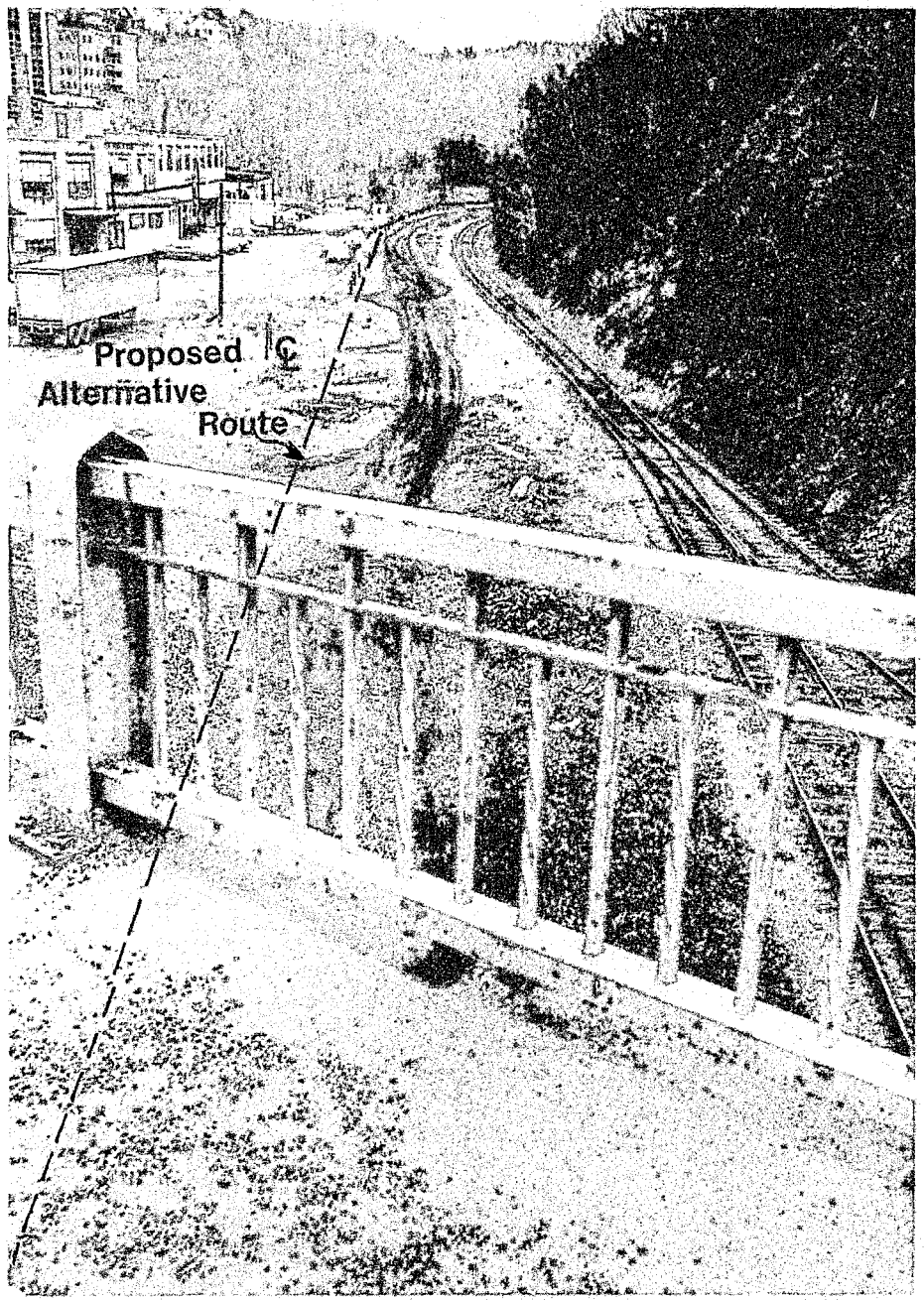
VIEW OF RAILROAD CORRIDOR [LOOKING NORTH] AT ROUTE 61 CROSSING SOUTH OF ROUTE 209 INTERSECTION. [See Figure 5, Page 40].



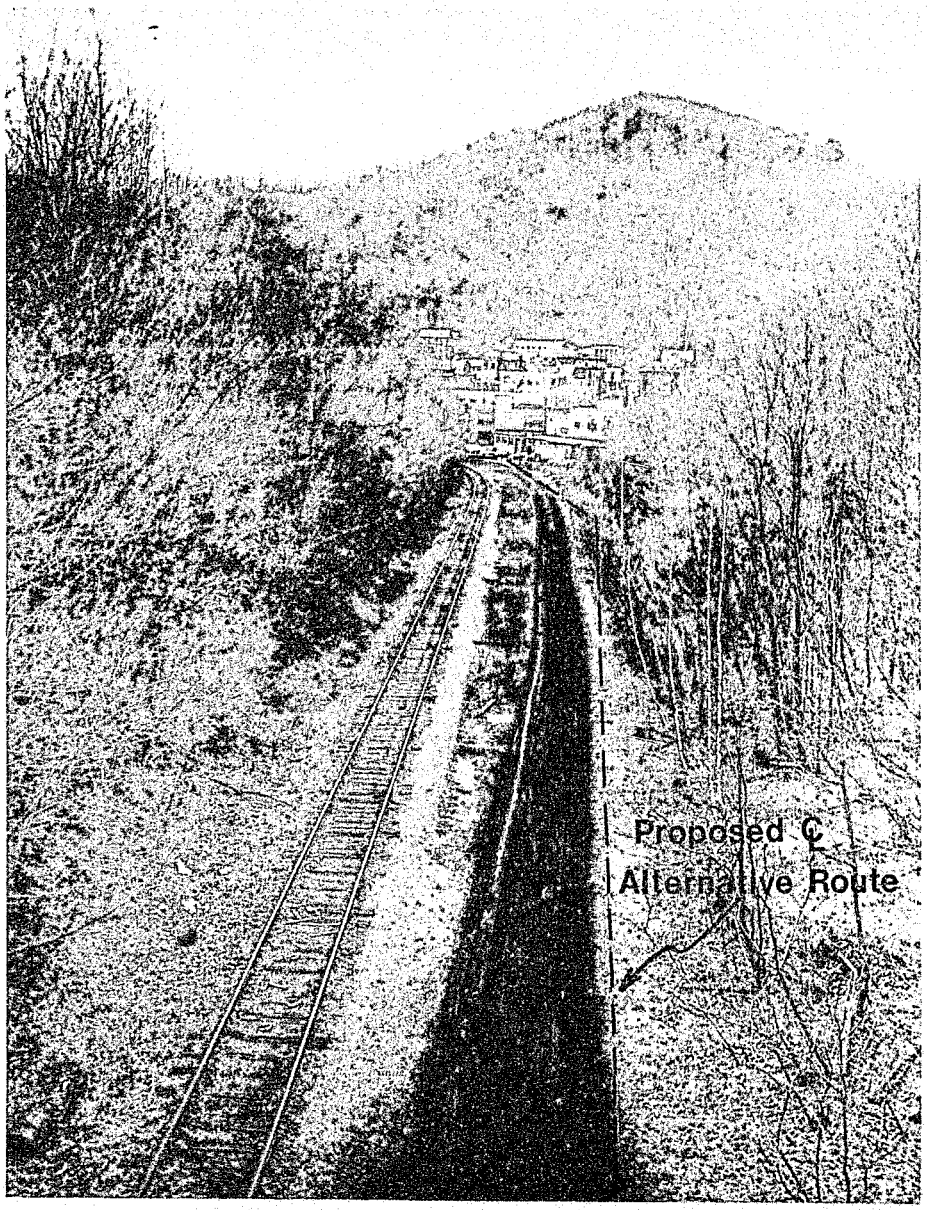
VIEW OF RAILROAD CORRIDOR (RIGHT) (LOOKING NORTH) PARALLELLING ROUTE 61 SOUTH OF POTTSVILLE. (See Figure 5, Page 40).



VIEW OF RAILROAD (LEFT) (LOOKING SOUTH) AND ROUTE 61 (RIGHT) CORRIDORS PARALLELLING MILL CREEK NORTH OF SAINT CLAIR. (See Figure 5, Page 40).



VIEW OF RAILROAD CORRIDOR (LOOKING EAST) AT ROUTE 61 CROSSING SOUTH OF POTTSVILLE.
(See Figure 5, Page 40).



VIEW OF RAILROAD CORRIDOR THROUGH PALO ALTO [LOOKING WEST]. [See Figure 5, Page 40].

ENGINEERING DESCRIPTION:

The Eastern Route will be 11.6 miles long and consist of 145 structures.

Line design is in accordance with the National Electric Safety Code Standards.

The power conductors will be 556.5 KCMIL 24/7 ACSR with a 3/8" high strength steel, 7 strand overhead ground wire. Structures are single, green, wood poles with upswept, laminated arms for the tangent structures. Two pole wood, guyed structures or single-shaft steel pole structures are used for the angles; steel poles are used only when there is insufficient room for guys. Guy wire consists of ½" high strength steel. The average span length between structures is 420 ft. See Figures 8, 9, 10, 11, 12, and 13 for typical structure configurations.

Segment A and part of Segment B involve replacing an existing single circuit 66 kV transmission line, Hauto-Frackville #1, with a double circuit 138 kV designed transmission line. In these segments, six power conductors (double circuit) will be installed initially (Figure 8, Page 61). In the remaining portion of Segment B and all other segments, one circuit will be installed initially (Figure 9, Page 62).

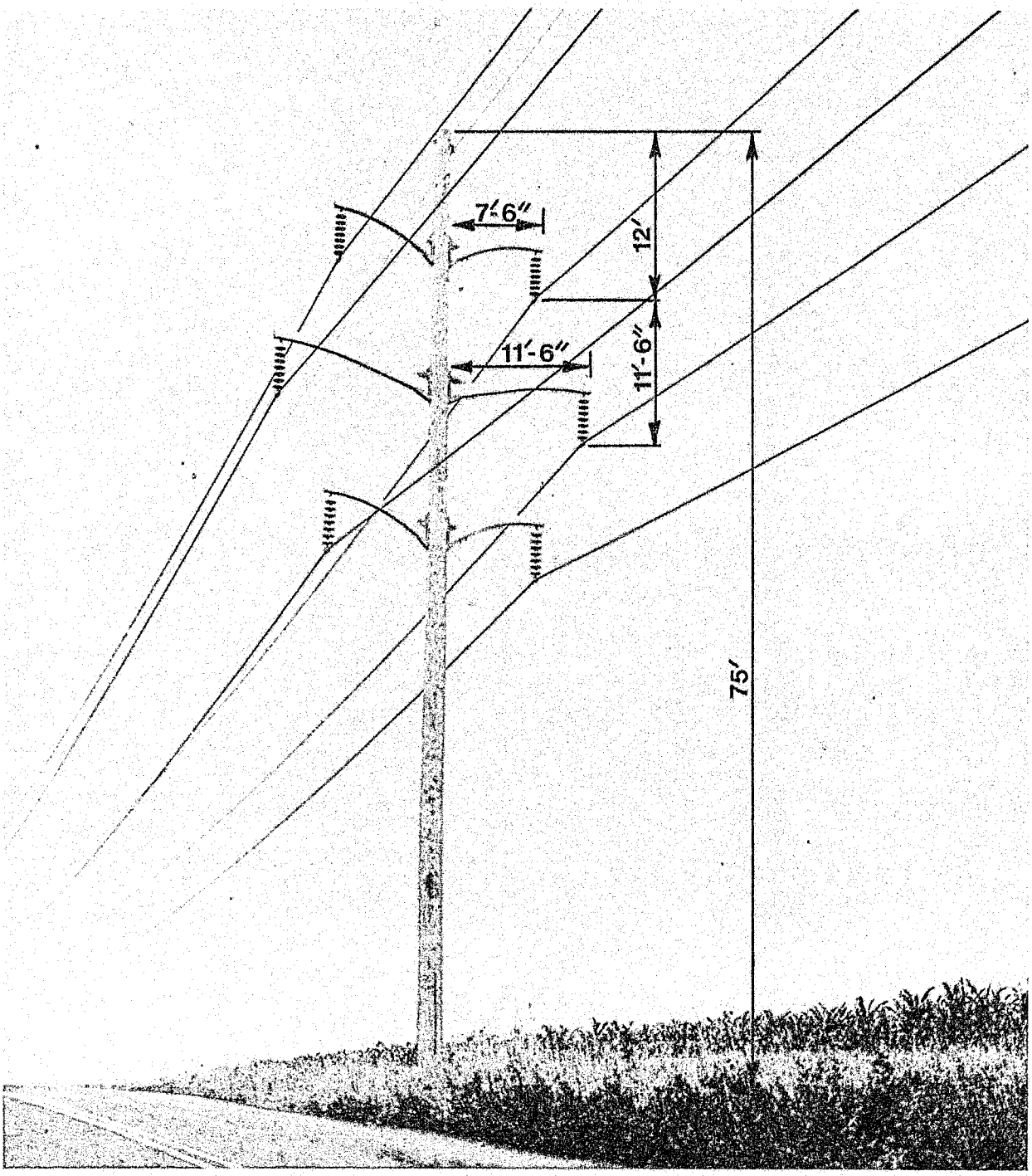
The designed minimum conductor ground clearances and conductor thermal ratings are shown below:

DESIGN MINIMUM CONDUCTOR GROUND CLEARANCE

Condition	Double Circuit Design (Figure 8) Clearance-to-Ground	Single Circuit (Initial) Design (Figure 9) Clearance-to-Ground
Normal load, average weather (60°C ambient temperature)	29 feet	40.5 feet
Predicted extreme thermal load (125°C conductor temperature)	25 feet	36.5 feet
Predicted extreme weather conditions (1 inch ice, no wind, 0°C)	27.5 feet	39.0 feet

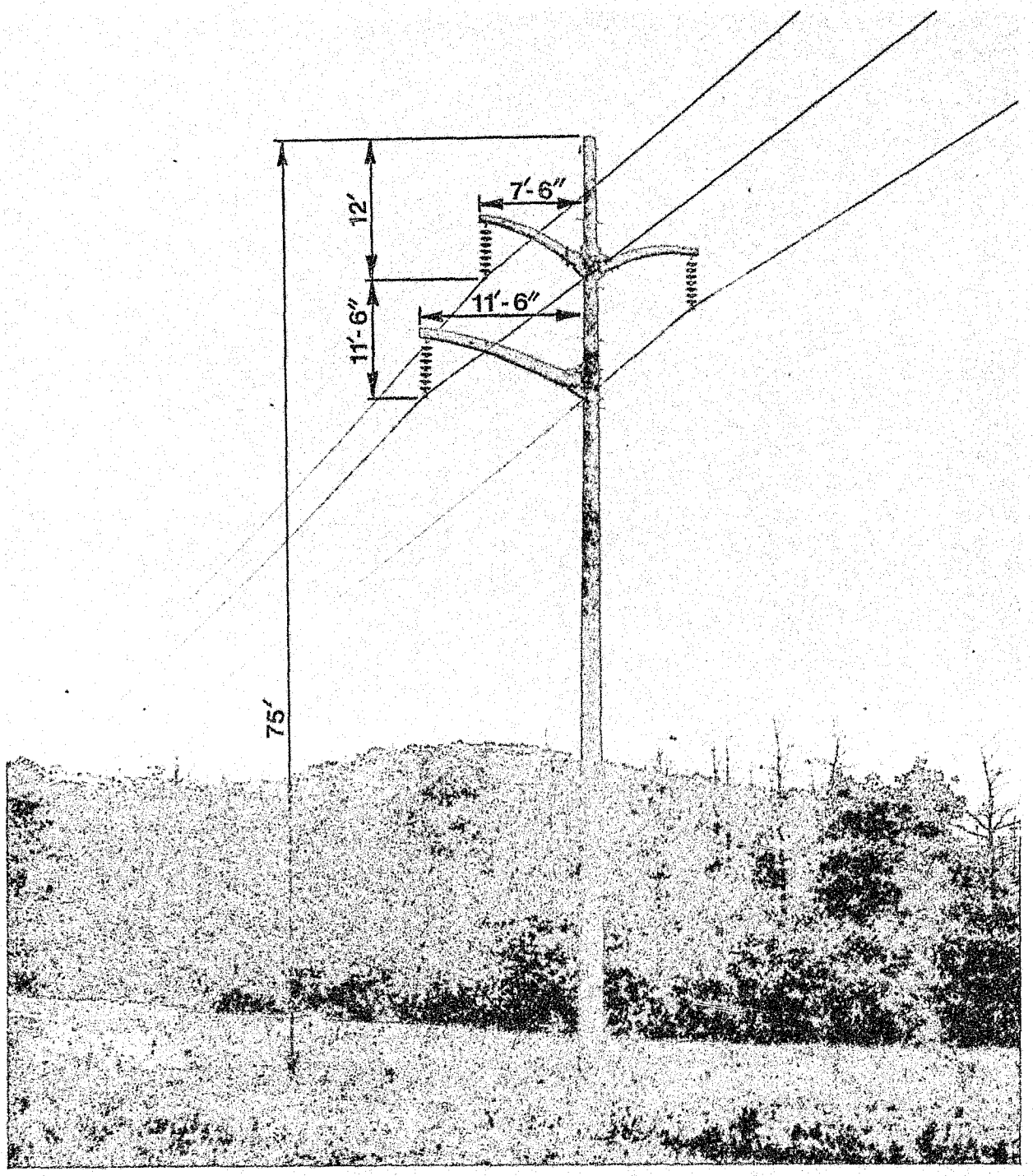
CONDUCTOR THERMAL RATING
556.5 KCMIL 24/7 ACSR
125°C MAXIMUM CONDUCTOR TEMPERATURE

CONDITION	AMBIENT TEMPERATURE °C	WIND SPEED KNOTS	AMPACITY (AMPS)
Summer Normal	35	0	815
Winter Normal	20	0	885
Summer Emergency	20	1	1030
Winter Emergency	10	1	1070



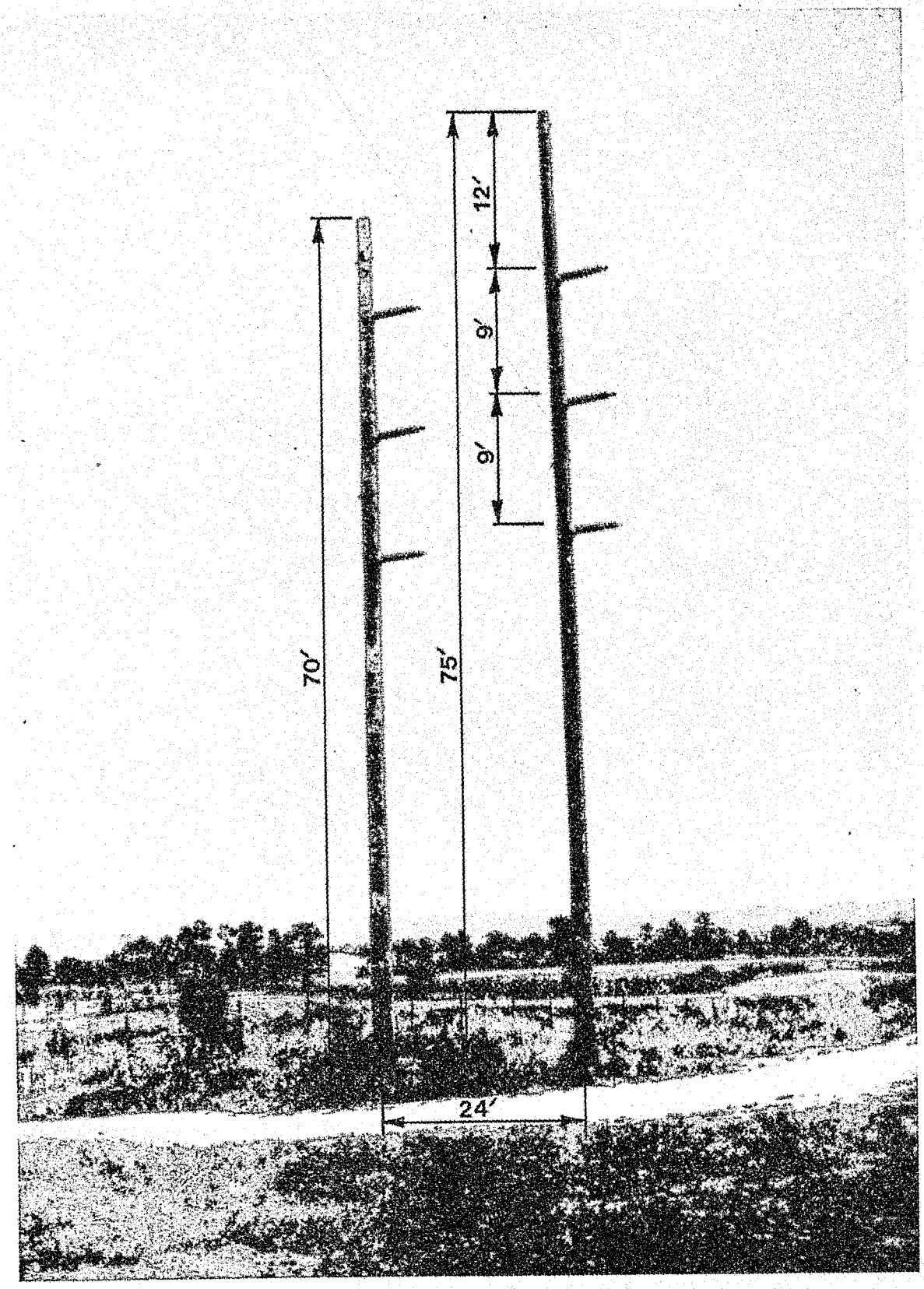
TYPE TSPD-2-L
138 kV TANGENT SINGLE POLE DOUBLE CIRCUIT STRUCTURE
DOUBLE CIRCUIT (INITIAL)
LONG SPAN CONSTRUCTION

FIGURE 8



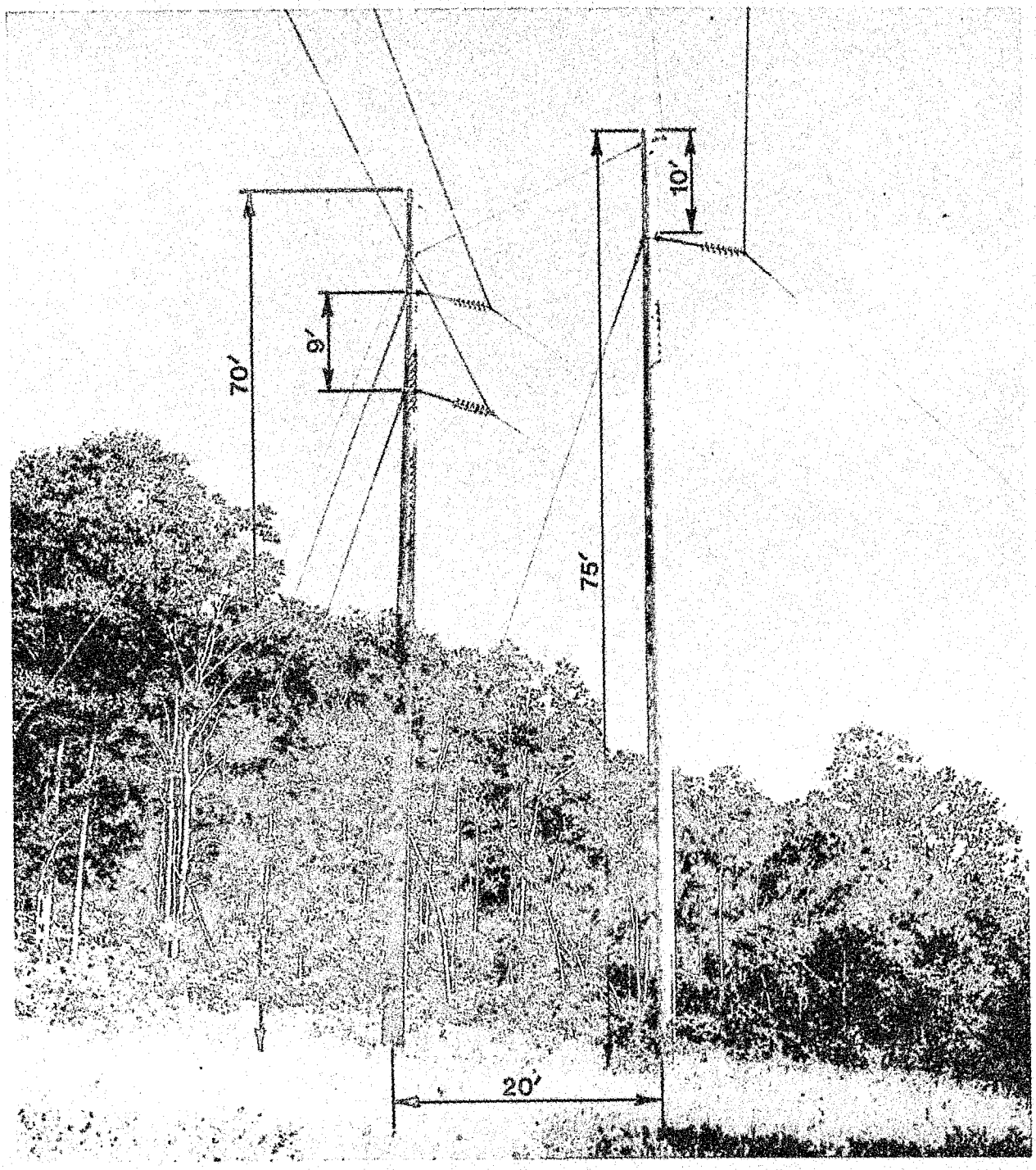
TYPE TSPD-1-L
138 kV TANGENT SINGLE POLE DOUBLE CIRCUIT STRUCTURE
SINGLE CIRCUIT (INITIAL)
LONG SPAN CONSTRUCTION

FIGURE 9



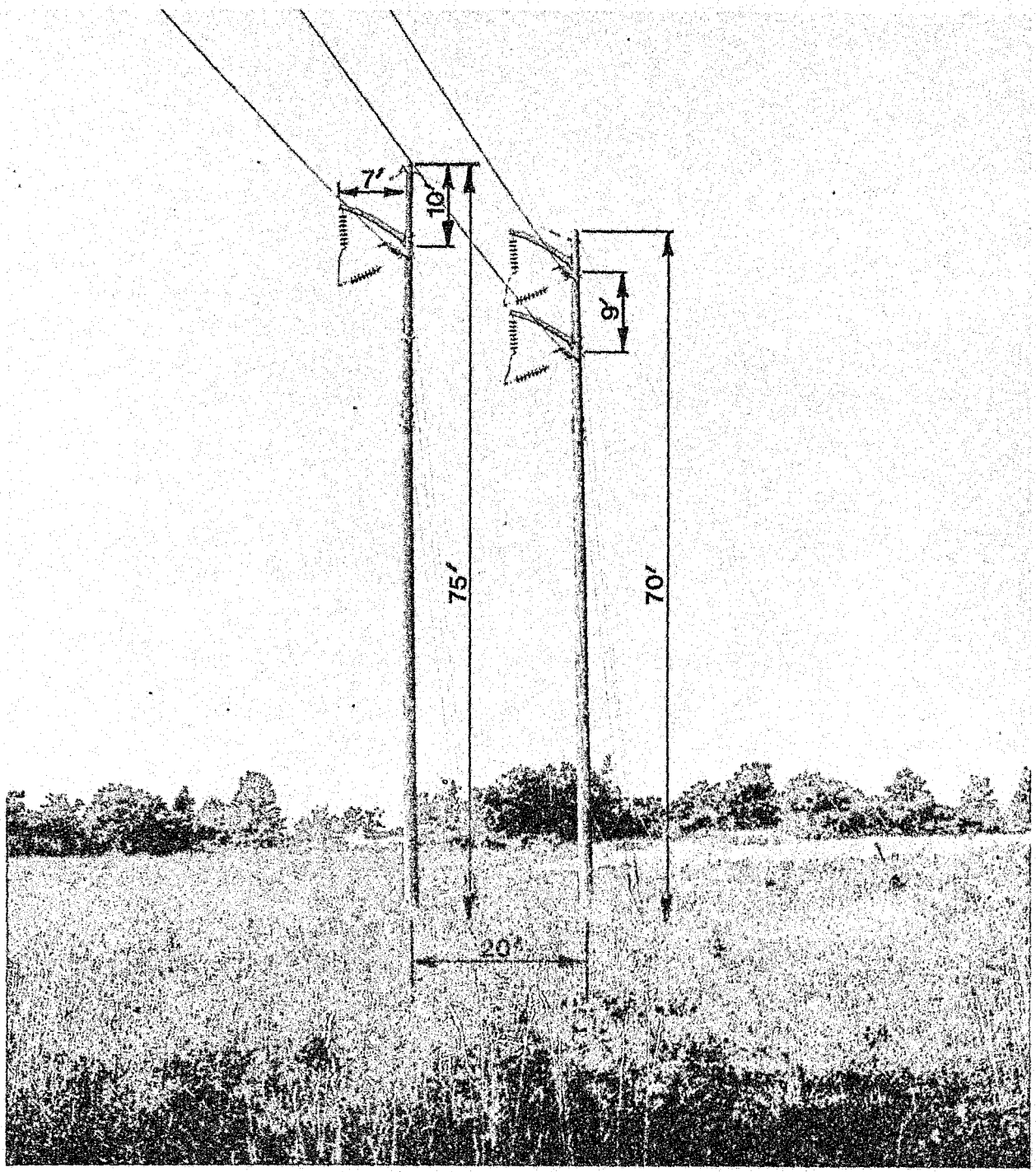
TYPE AG-2-L
138 kV TWO POLE GUYED STRUCTURE
DOUBLE CIRCUIT (INITIAL)
LIGHT ANGLES (1°-20°)

FIGURE 10



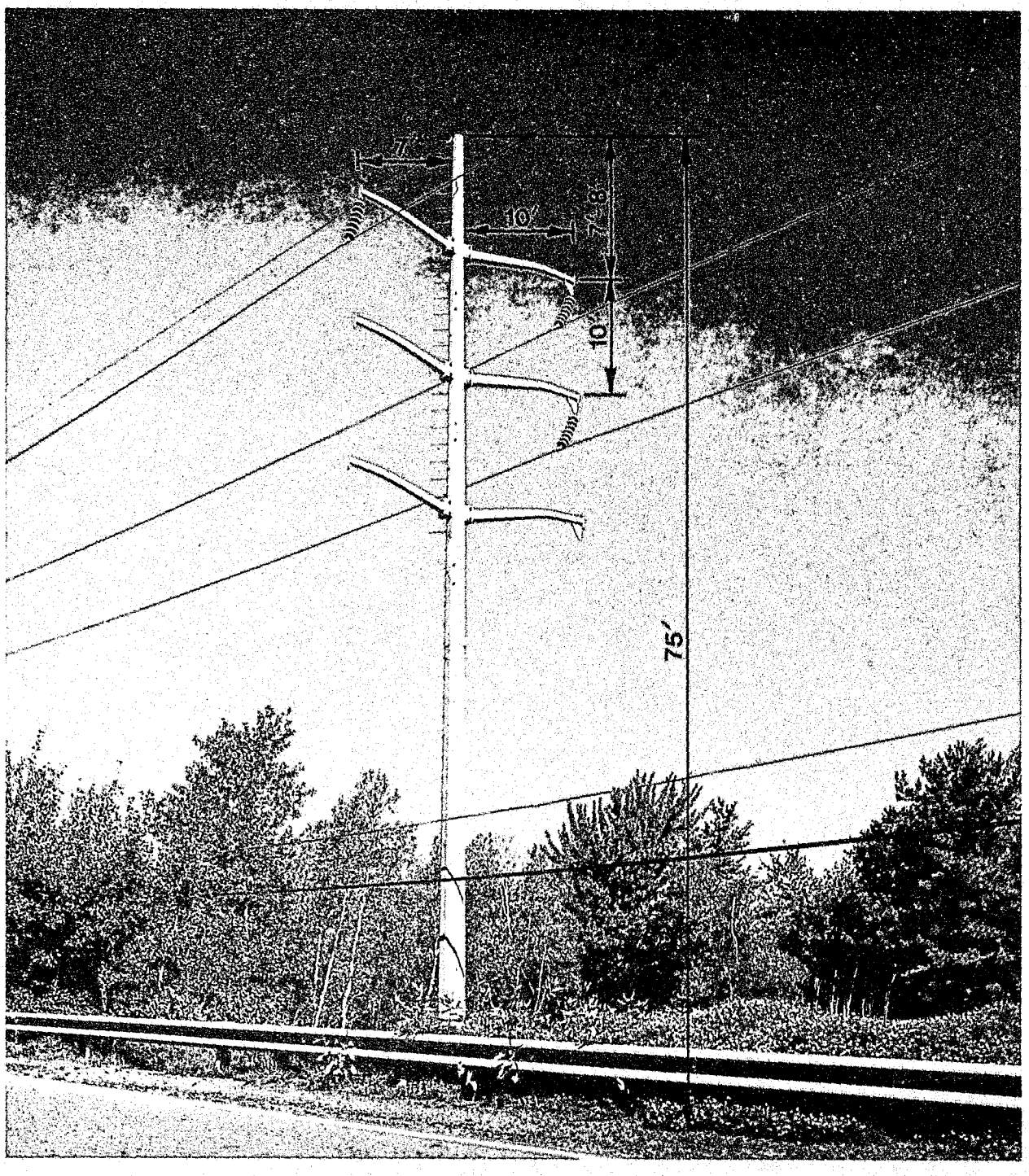
TYPE AG-1-M
138 kV TWO POLE GUYED STRUCTURE
SINGLE CIRCUIT (INITIAL)
MEDIUM ANGLES (21°-59°)

FIGURE 11



TYPE AG-1-H
138 kV TWO POLE GUYED STRUCTURE
SINGLE CIRCUIT (INITIAL)
HEAVY ANGLES (60°-90°)

FIGURE 12



TYPE SPDC-1-L
138 kV STEEL POLE SELF-SUPPORTING DOUBLE CIRCUIT STRUCTURE
SINGLE CIRCUIT (INITIAL)
LIGHT ANGLES (1°-10°)

FIGURE 13

IMPACT OF THE PROPOSED ROUTE

The following is a discussion of the predicted impact (both positive and negative) of the proposed transmission line. For a full understanding of the predicted impacts, the appropriate Inventory Map, associated map descriptions, the assessment tables and the section pertaining to the engineering specifications, (i.e., Proposed Transmission Structures; Right-of-Way width and Engineering Description) would be helpful. Note also that the relative impacts of alternative routes considered are discussed under the route evaluation and selection sections of this report.

As was demonstrated, the impacts associated with a transmission line are numerous and varied. Impacts were determined by; 1) location of the line in the study area, 2) structure placement, 3) the distance the impacted features are from it, 4) stage of the project (surveying, clearing, road construction, handling and hauling of material, structure placement), 5) operation and maintenance of the line, 6) type, size, color of structures used, 7) right-of-way width needed, and 8) time of year line will be constructed.

The proposed line was routed to avoid impacts and mitigating measures will be employed where impacts are unavoidable.

Land Use

The proposed route was analyzed in relation to current and future land use. The preferred route will not create a significant adverse impact on the existing or potential land use in the study area. As indicated on Map 8, the line avoids large residential developments, public areas and does not require the removal of homes.

The right of way required for the proposed route will preclude any use such as a building or swimming pool that may impair the operational integrity of the transmission facility or jeopardize public safety. However, many land uses are compatible with the proposed right of way. Agricultural or pasture land crossed would be minimally affected by the proposed line because the land can still be farmed or used as pasture. Also, the transmission structures will be spaced over 400 feet apart. In proximity to a home, the right of way can be used for parking, gardens, recreation, etc. Also, the right of way lends itself to various linear recreation activities such as horseback riding, biking or hiking. These uses, though sometimes beneficial, could be undesirable if property owners do not

want the public to use the right of way crossing their land. Any such problem could be remedied by installing gates at the public road entrances to the right of way.

Natural Features

Aquatic Resources

The major impact associated with spanning water bodies is the potential for siltation due to the increased runoff and soil erosion from road and structure construction and vegetation removal. Also, vegetation clearing on stream banks can result in increased stream temperatures. An extensive erosion control and vegetation preservation and management program, outlined in PP&L's Erosion Control and Vegetation Management Specifications, will be employed at all water body crossings. These mitigative measures will keep impacts to a minimum, thereby preventing adverse effects on fish and other aquatic life and degradation of the area's high quality waters.

Herbicides used in the vegetation management program for the proposed right of way can also effect water quality and aquatic life. All chemicals used on the right of way will be EPA-approved and will be applied selectively in accordance with all labeled precautions. These practices will keep the possibility of herbicides, entering surrounding waters to a minimum.

Terrestrial Resources

Vegetation

An obvious direct impact of the proposed line is the alteration of forest vegetation. Selective clearing measures followed by PP&L (outlined in the Vegetation Management specifications) will preserve low-growing species and understory shrubs, but mature trees will be removed. This will result in the establishment of an earlier successional vegetative community of grasses, sedges, ferns, and shrubs. The removal of forest trees will not have a significant impact.

Stands of evergreen will be minimally affected, since PP&L's Vegetation Management Specifications limit clearing in stream ravines and along stream banks. All plantations were avoided during the siting process.

No impact is expected on vegetation in brush land and agricultural areas, except where scattered trees must be cleared. Wetland vegetation will not be disturbed.

As outlined under "Aquatic Resources," only EPA-approved herbicides will be used, and extensive precautions will be taken in the vegetation management program for the line. No significant impacts are expected on non-target vegetation.

Wildlife

Impacts to animals along the transmission line may take several forms. Some local mortality to less mobile species will probably occur, but this impact is of a localized, minor nature, as no endangered species will be affected by construction. Some localized, temporary disturbance will result due to noise and human activity during construction. The major impact of the proposed transmission line on wildlife will result from the alteration of existing habitat, particularly in areas where the clearing of forest is necessitated.

Species which will be negatively affected by the removal of habitat are those which depend to a great extent on forested areas for food and denning or nesting, such as squirrels, porcupines, bats and forest-dwelling birds. Impact to these species will be localized and minimal, resulting in displacement of the animals, with no significant effect on total populations.

Most species will benefit from the creation of openings in the forest, which establish "edge" communities characterized by high diversity and productivity. The plants which establish themselves on these cleared areas are extensively browsed and used for food and cover by many species. The line is expected to provide significant new food and cover sources, benefiting birds which inhabit field and forest borders, and game species such as bear, grouse, turkey, rabbits, deer, and woodcock.

The line will not affect any wetland areas. Therefore, no impacts are expected on nesting water birds, furbearers, and those amphibians and reptiles which prefer such areas.

Precautions taken during use of herbicides on the right-of-way are discussed under "Aquatic Resources." By following them, no hazards to animal life are expected.

Unique Natural Areas

The proposed line will not disturb any unique natural areas as none are present in the study area.

Geology

The proposed facilities will have no impact on geologically unique areas;

Pole placement will require minor disruption of surface deposits and drilling or blasting into the bedrock. This construction activity will not affect th surface or bedrock geology in general, and extensive blasting will occur only in shallow bedrock areas. Disruption of the soil above shallow bedrock will slow the reestablishment of vegetation in these areas. The seeding and soil stabilization measures outlined in PP&L's Erosion Control and Vegetation Management Specifications will help to minimize this impact.

Soils and Slopes

Economic penalties will be incurred where the proposed line traverves wet soils, stony soils, areas of shallow bedrock or steep slopes.

The major potential environmental impact is soil erosion. PP&L's Soil Erosion and Sedimentation Control Specifications for transmission line rights of way will be used in all phases of construction and future line maintenance.

The primary area of concern for potential erosion is where the proposed route crosses steep slopes.

Generally, as outlined in PP&L's Soil Erosion and Sedimentation Control Specifications, access roads on the right of way will be designed to minimize erosion problems, disturbed soil will be stabilized by hydroseeding, existing vegetation will be retained to the greatest possible extent and where possible access roads will not cross streams.

Cultural Features

The proposed line will not disturb any identified historic site or very sensitive archeological area. These cultural features were avoided by the proposed line route.

MITIGATION MEASURES FOR PROPOSED LINE SEGMENTS

Segment A (Hauto-Frackville No. 1 66 kV line parallel).

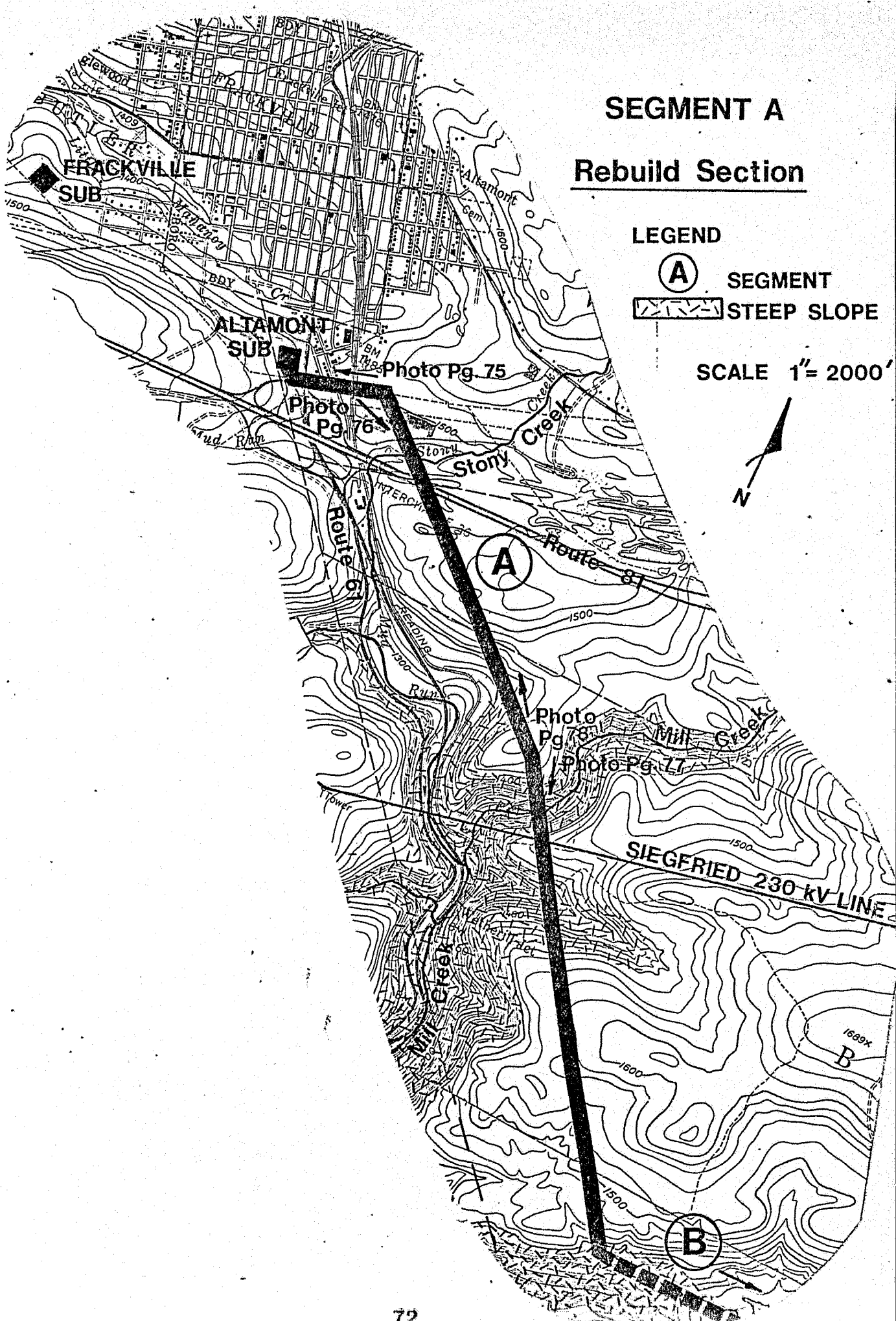
This segment, between the Altamont 66-12 kV substation and the point in the Wolf Creek area where the Hauto-Frackville 66 kV line turns east, is depicted on the following page.

For this entire segment the proposed line would be jointly occuping double circuit structures with the existing Hauto-Frackville line. The short portion out of Altamont Substation to the point where the Hauto-Frackville line turns southeast, will use existing towers. Those towers now support the Hauto-Frackville line and a second 66 kV built line currently operated at 12 kV. The circuit operated at 12 kV will be energized at 66 kV as part of the Frackville-Orwigsburg circuit. The 12 kV circuit thereby lost will be replaced by adding an aerial cable 12 kV line to existing distribution poles parallelling this double circuit tower line. Finally, the last tower on this portion of the segment, at an angle point north of Route 81, will be replaced by a single self supporting, steel pole double circuit structure.

The remainder of this segment presently consists of single circuit "H" frame structures carrying the Hauto-Frackville line. Those structures, on 100 foot right of way, will be removed and replaced by single pole double circuit structures to carry the Hauto-Frackville and the proposed line.

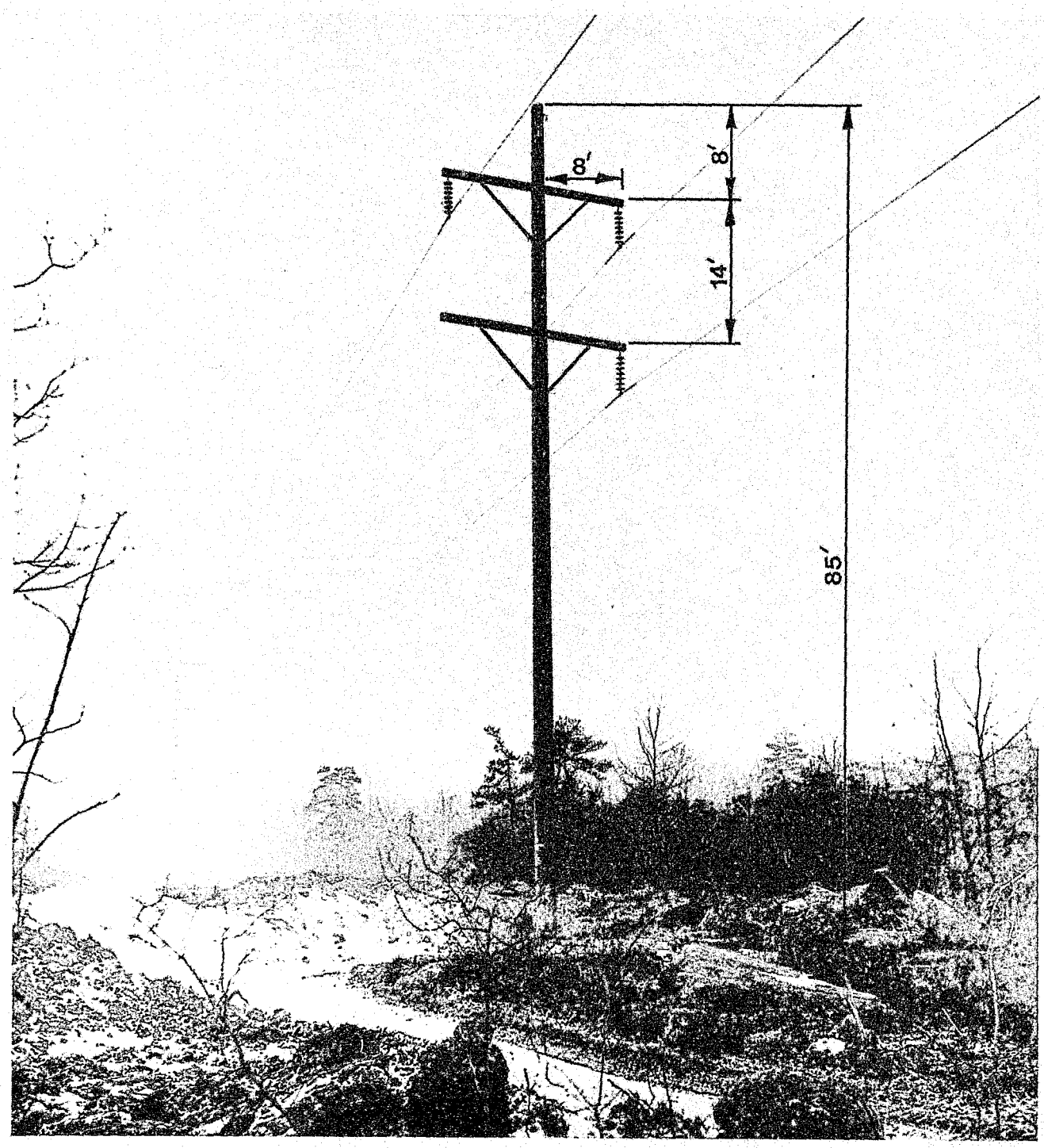
All line construction will be done within the existing right of way. Existing access will be used to avoid constructing roads on steeply sloped areas and across streams, as shown on Map 3, Sheets 1 and 2 of Applicant's Exhibit "C" (Clearing and Access Road Plan). No additional vegetation clearing or access road building are necessary. In sloped areas where existing roads do not adhere to current soil erosion specifications, restoration work will be done to comply with PP&L's "Soil Erosion and Sedimentation Control on Transmission line Rights-of-Way."

Segment A crosses two streams; Mill Creek and Stony Creek. The Mill Creek crossing is in a gorge area where a long span over the stream area will be rebuilt using the existing access. The Stony Creek crossing will be at midspan on a 460 foot span north of Route 81. No access roads will be constructed through Stony Creek since the line can be approached from Interstate 81 to the south and the industrial park to the north. Tailored clearing will be


SEGMENT A
Rebuild Section
LEGEND
A SEGMENT
STEEP SLOPE
SCALE 1"= 2000'
N
FRACKVILLE SUB
ALTAMONT SUB
Photo Pg. 75
Photo Pg. 76
Photo Pg. 78
Photo Pg. 77
Stony Creek
Route 61
Route 81
Mill Creek
SIEGFRIED 230 kV LINE
A
B

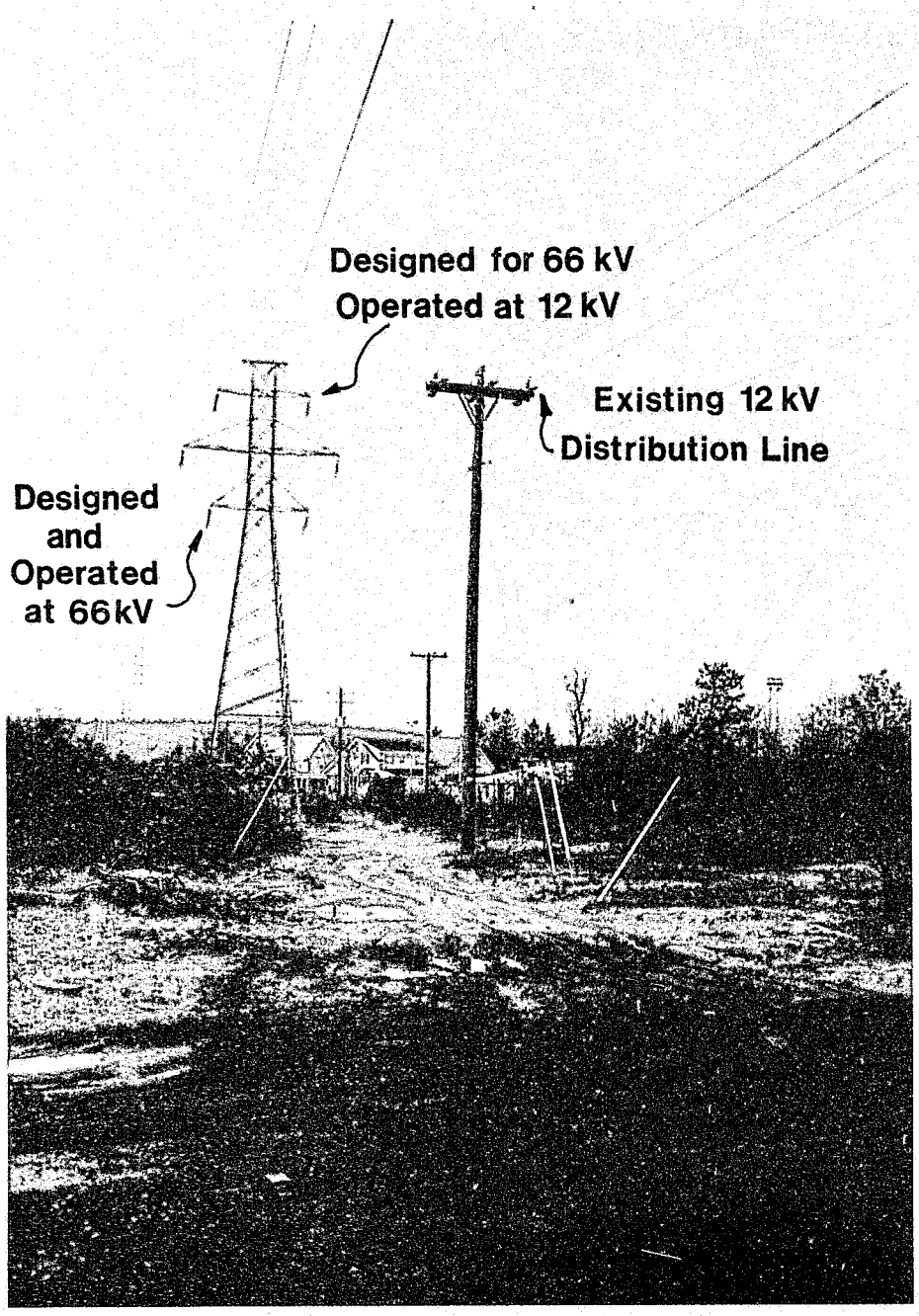
done at stream crossings and road screens will be left at the Interstate 81 crossing.

To mitigate the line's visual impact at the Route 81 crossing and for the 6000 feet of line which is visible from Routes 81 and 61, long span, upswept arm, single wood pole structures (Figure 8, page 61) will be used. In areas where the line is not visible, the use of long span, straight arm, single wood pole structures (Figure 14, Page 74) or direct embedded steel structures will be used. Estimated structure costs for this report are based on the upswept arm, wood structure. However, lines using straight arms and direct embedded steel poles may prove more economical at certain locations.

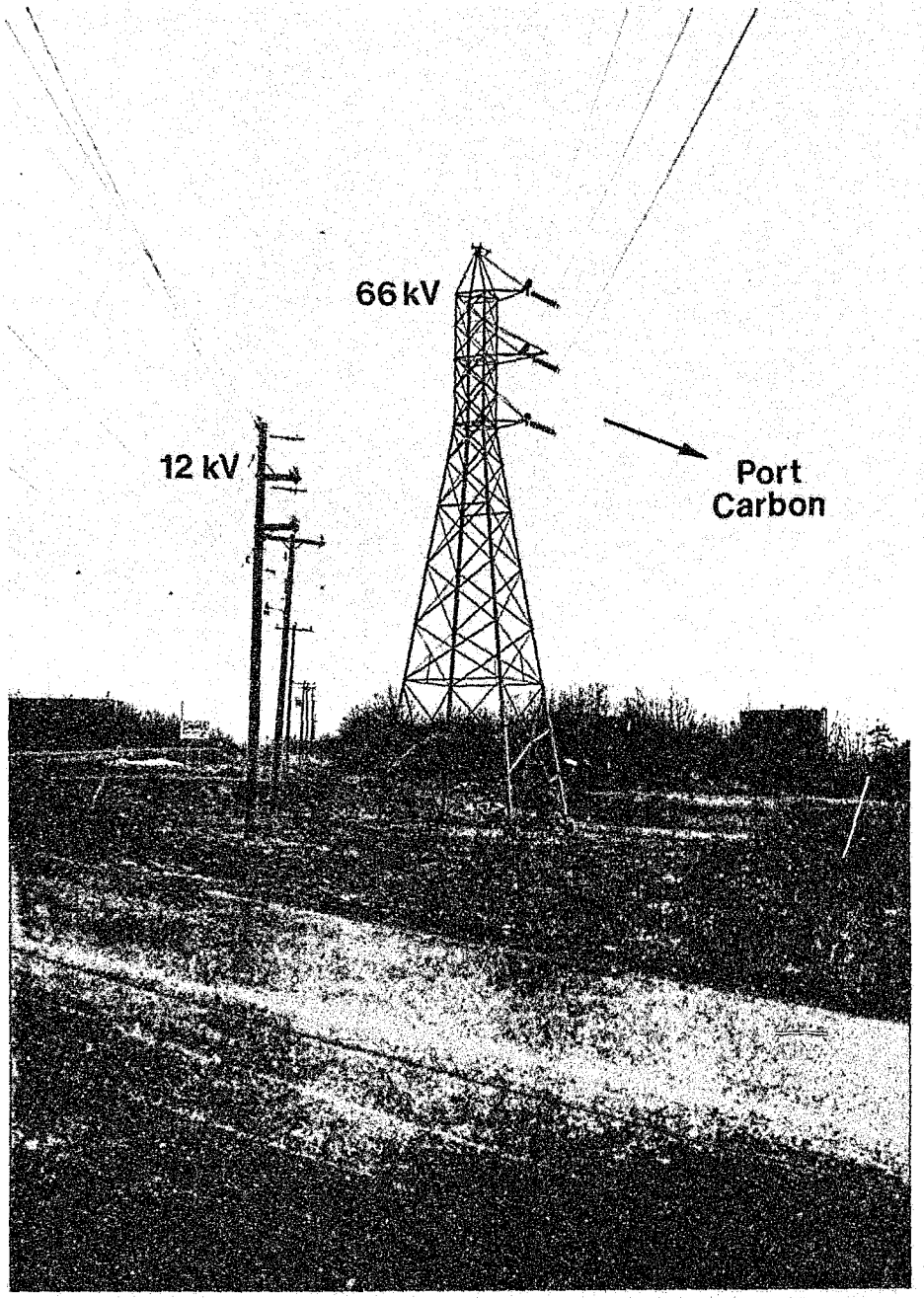


TYPE TSPD-1-L (SA)
138 kV TANGENT SINGLE POLE STRAIGHT ARM DOUBLE CIRCUIT STRUCTURE
SINGLE CIRCUIT (INITIAL)
LONG SPAN CONSTRUCTION

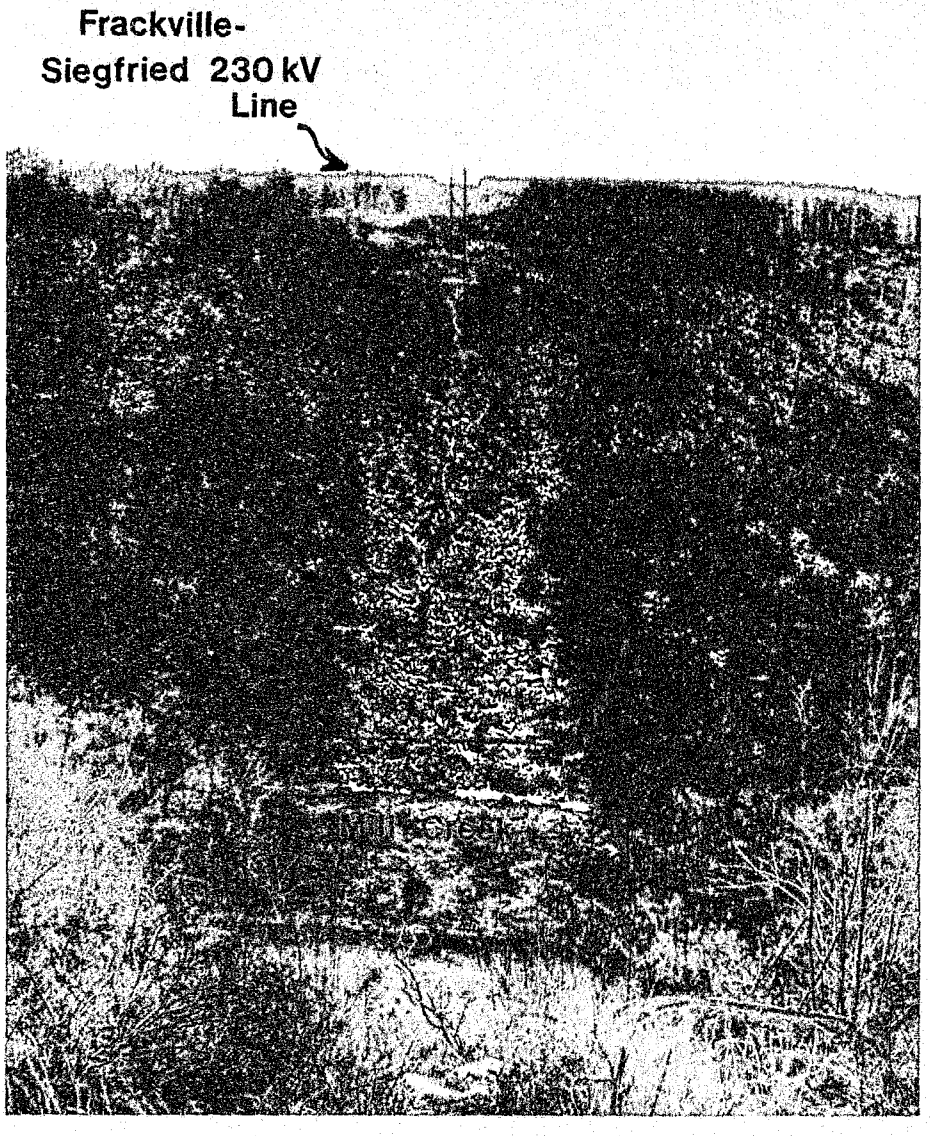
FIGURE 14



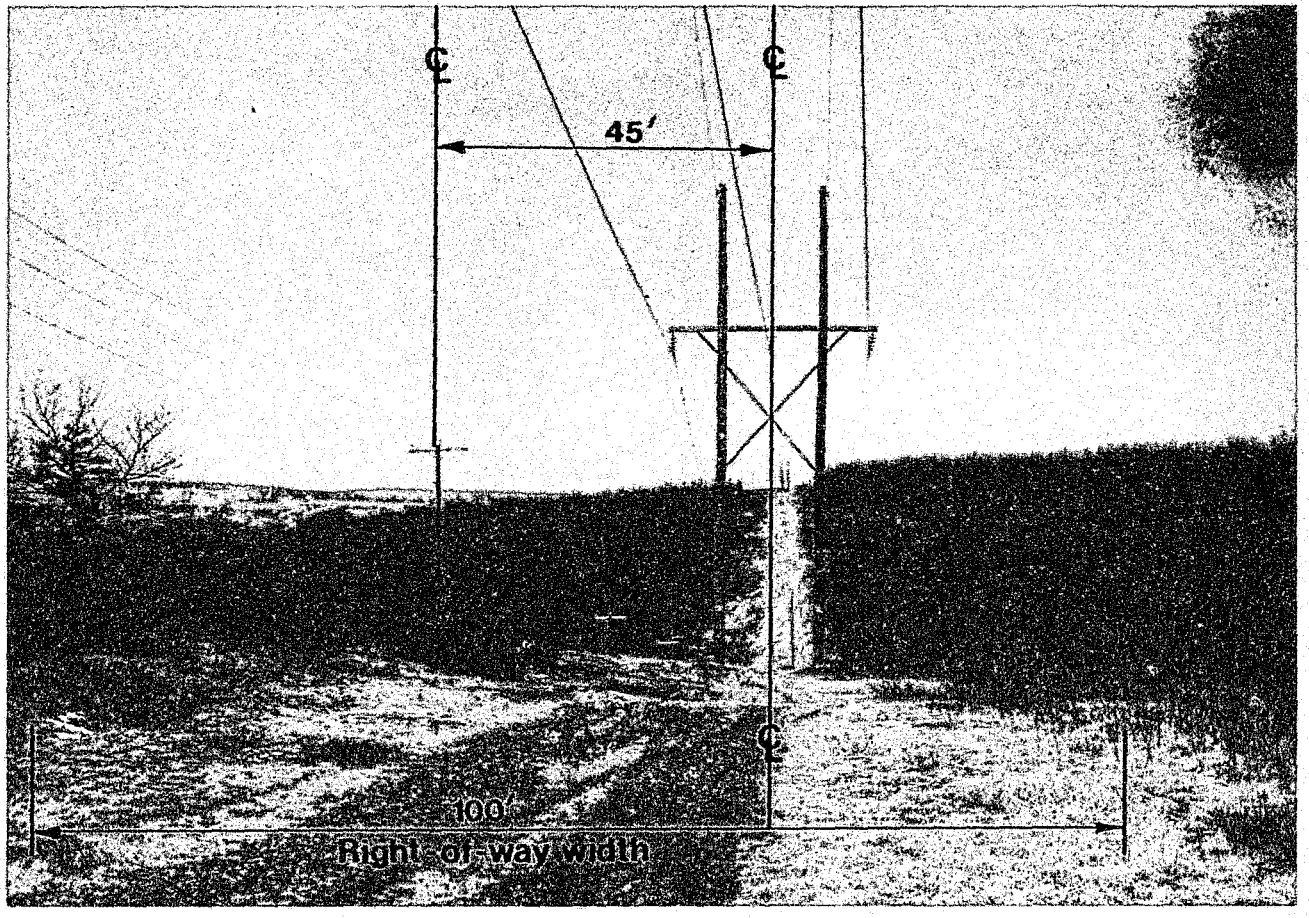
VIEW [LOOKING WEST] OF EXISTING DOUBLE CIRCUIT TOWER LINE AND DISTRIBUTION LINE BETWEEN ALTAMONT SUBSTATION AND REBUILD SECTION.



STEEL LATTICE TOWER ANGLE STRUCTURE TO BE REPLACED BY SELF-SUPPORTING TUBULAR STEEL POLE.



VIEW [LOOKING SOUTH] OF EXISTING HAUTO-FRACKVILLE NO. 1 RIGHT-OF-WAY CORRIDOR OVER MILL CREEK.



VIEW (LOOKING NORTH) OF EXISTING HAUTO-FRACKVILLE NO. 1 RIGHT-OF-WAY CORRIDOR. "H"-FRAME, 66 kV SINGLE CIRCUIT LINE TO BE REPLACED WITH SINGLE-POLE, 138 kV DOUBLE CIRCUIT LINE ON EXISTING CENTERLINE.

Segments B-F (From Hauto-Frackville Right Of Way to Port Carbon Substation)

This segment is shown on the following page.

In this section an additional 4400 ft. of the single circuit "H" frame Hauto-Frackville #1 Line will be rebuilt. Again, no additional clearing or access roads are required to rebuild the line to single pole 138 kV double circuit line.

The proposed line turns south from the Hauto-Frackville line, crosses wooded terrain, then enters strip-mined areas. Some of this land has been "stripped" by coal companies but is not now being mined.

In strippable areas the line's final location will be selected to avoid conflicts with present or anticipated coal mining operations.

The tap into Port Carbon (Segment F) from the mainline (Segments A-B-D) is about 1.3 miles in length. Approximately 1800 feet of the line borders a proposed residential development adjacent to the Port Carbon Substation. To minimize lot dislocation, in this area, the line will follow the property boundary on the perimeter of the proposed development.

This line segment crosses the Wolf Creek twice and the Little Wolf Creek. The use of long span construction and tailored clearing will minimize the impact on these areas and no access roads will be constructed through the streams.

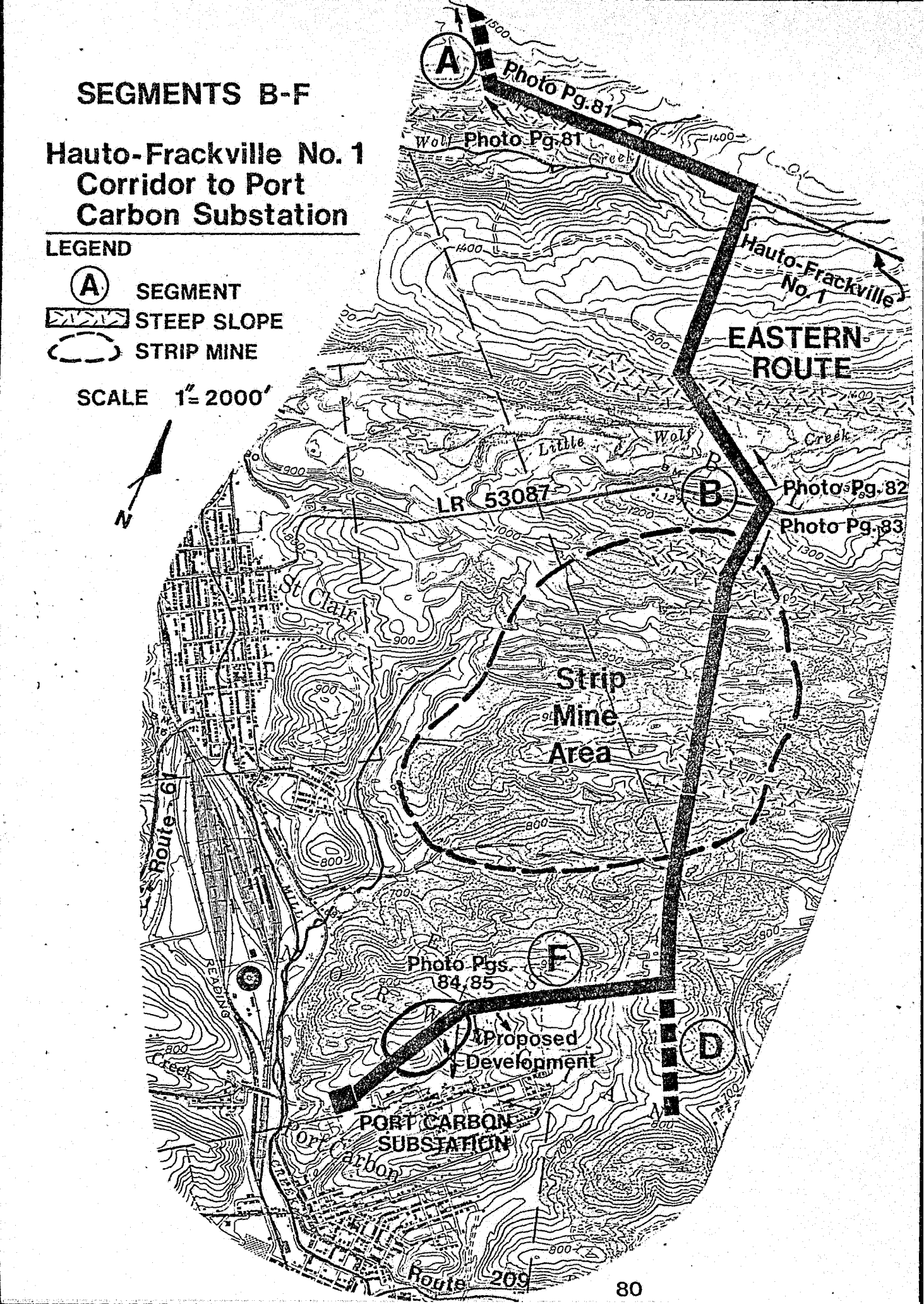
SEGMENTS B-F

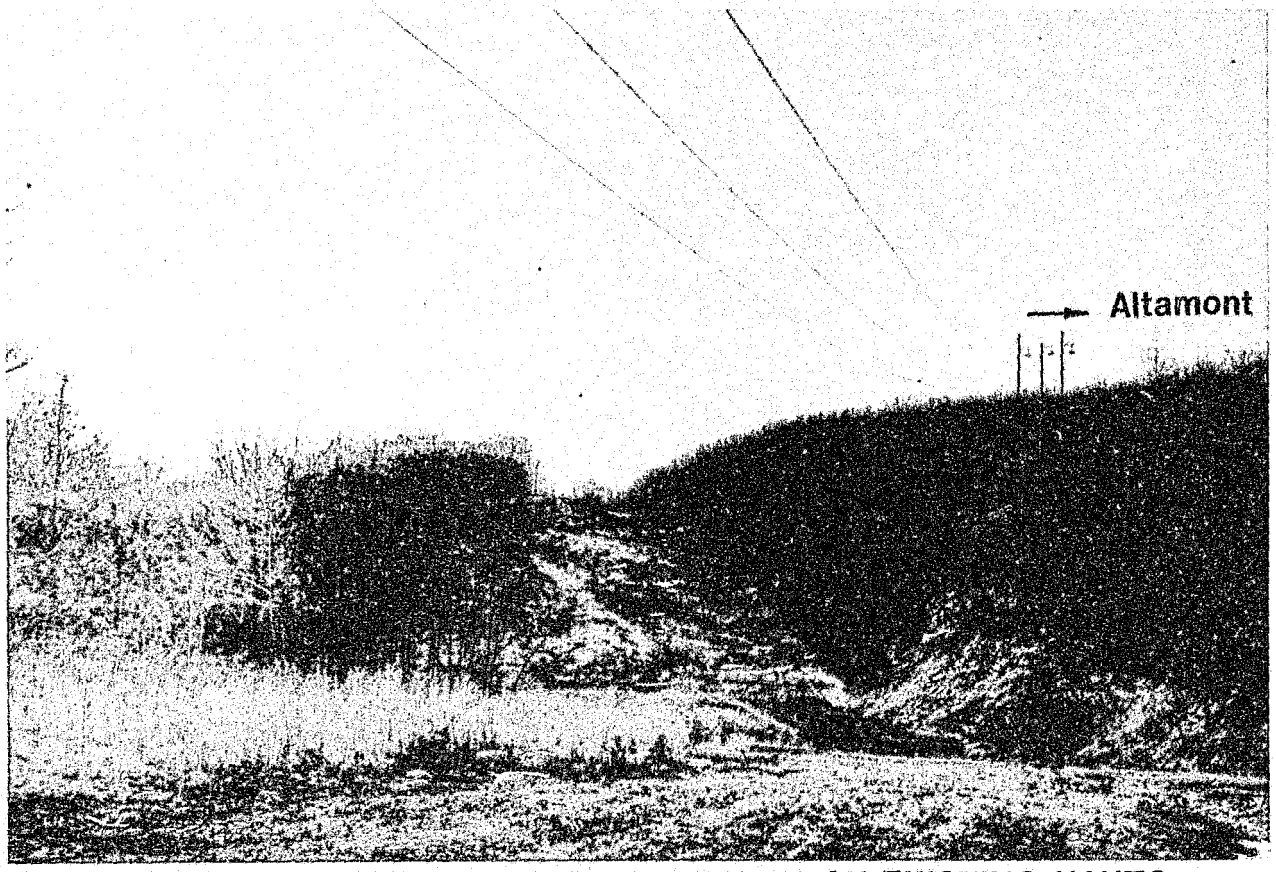
Hauto-Frackville No. 1 Corridor to Port Carbon Substation

LEGEND

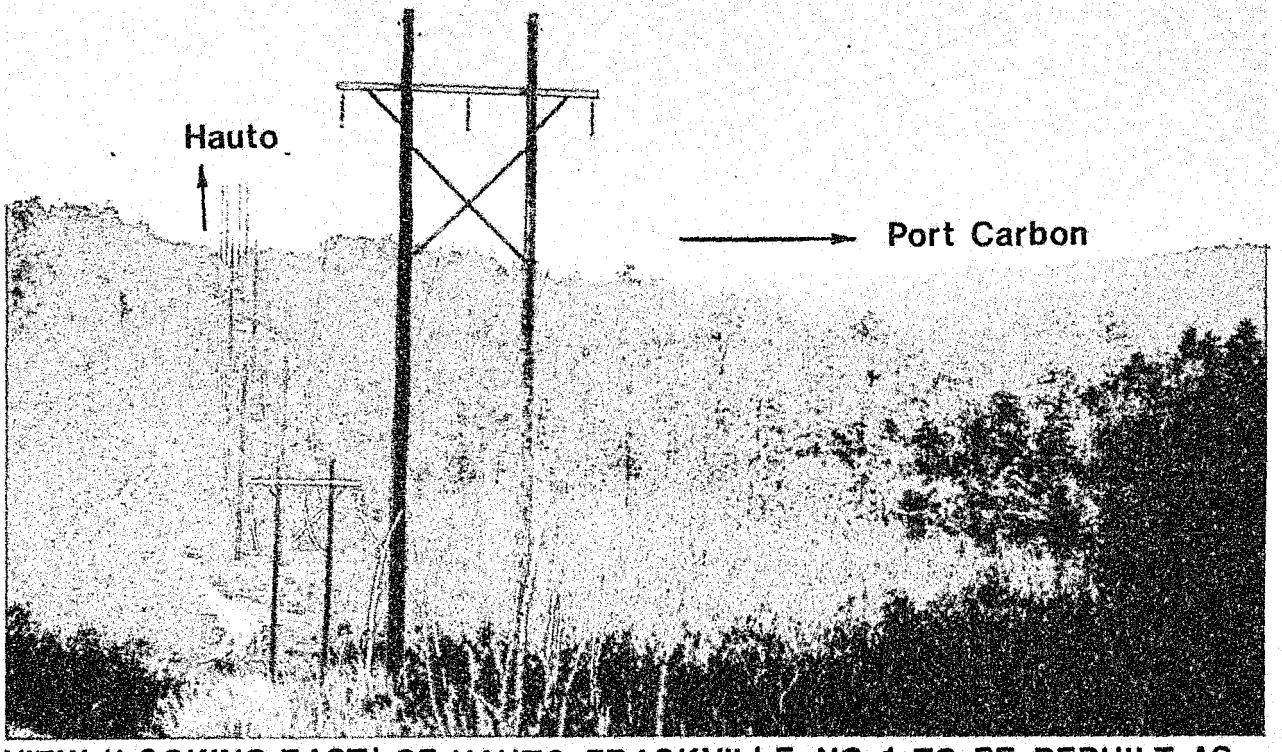
- (A) SEGMENT
- STEEP SLOPE
- STRIP MINE

SCALE 1" = 2000'

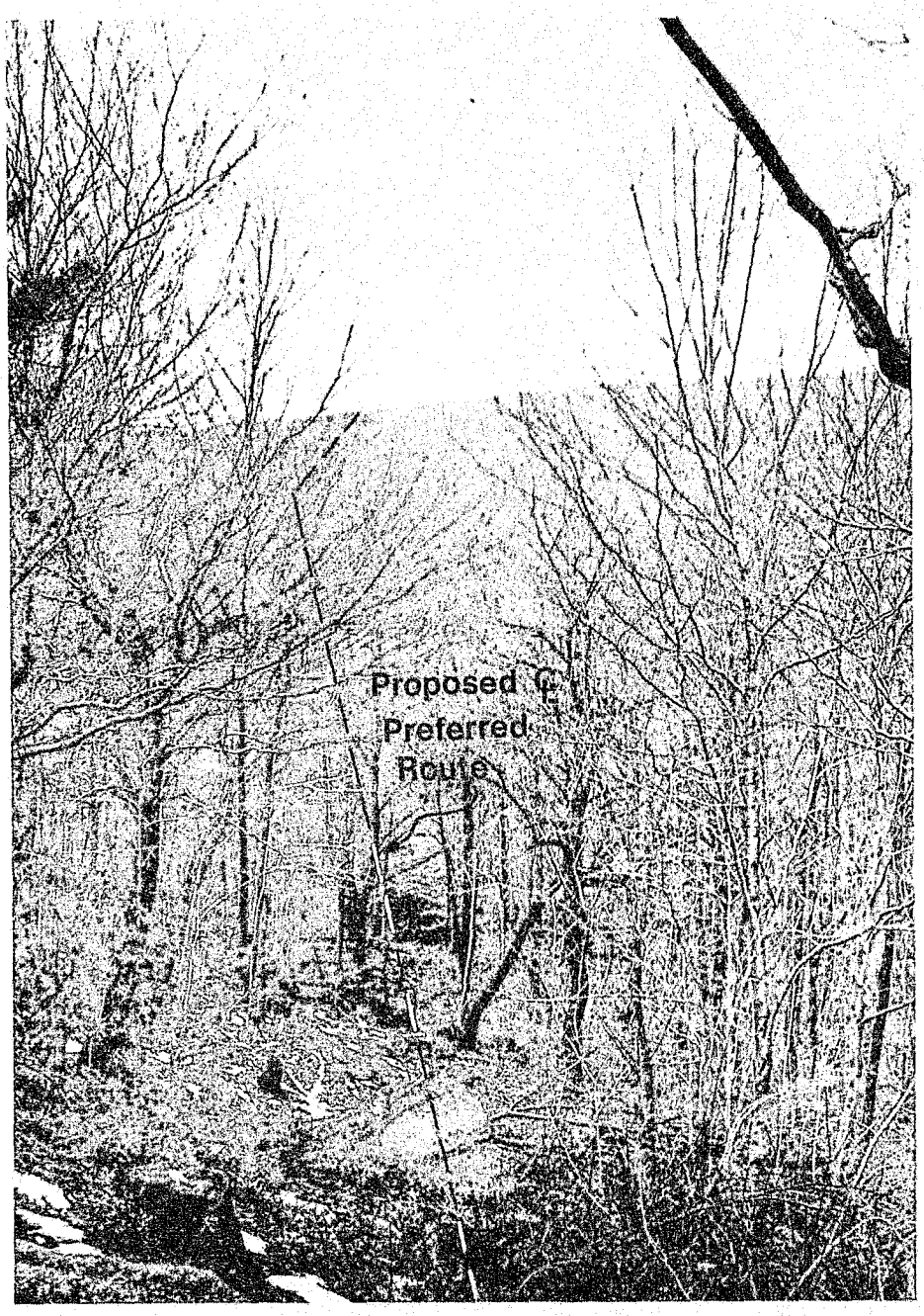




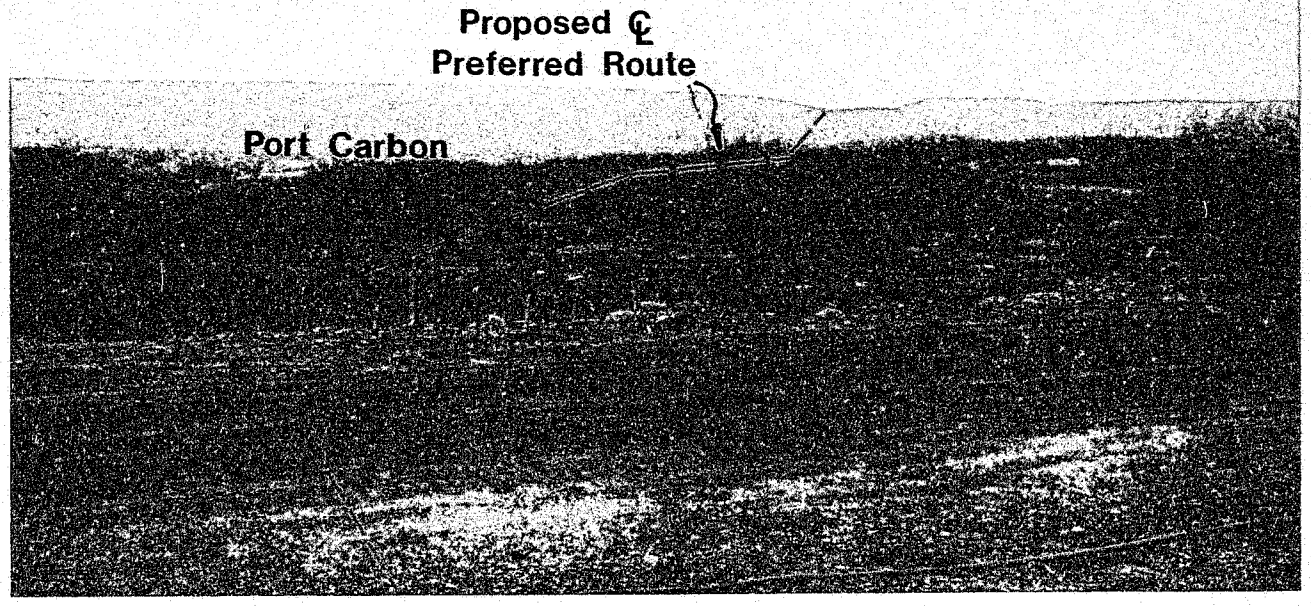
VIEW [LOOKING WEST] OF ANGLE STRUCTURE ON EXISTING HAUTO-FRACKVILLE NO. 1 LINE WHICH IS THE LAST STRUCTURE ON SEGMENT A.



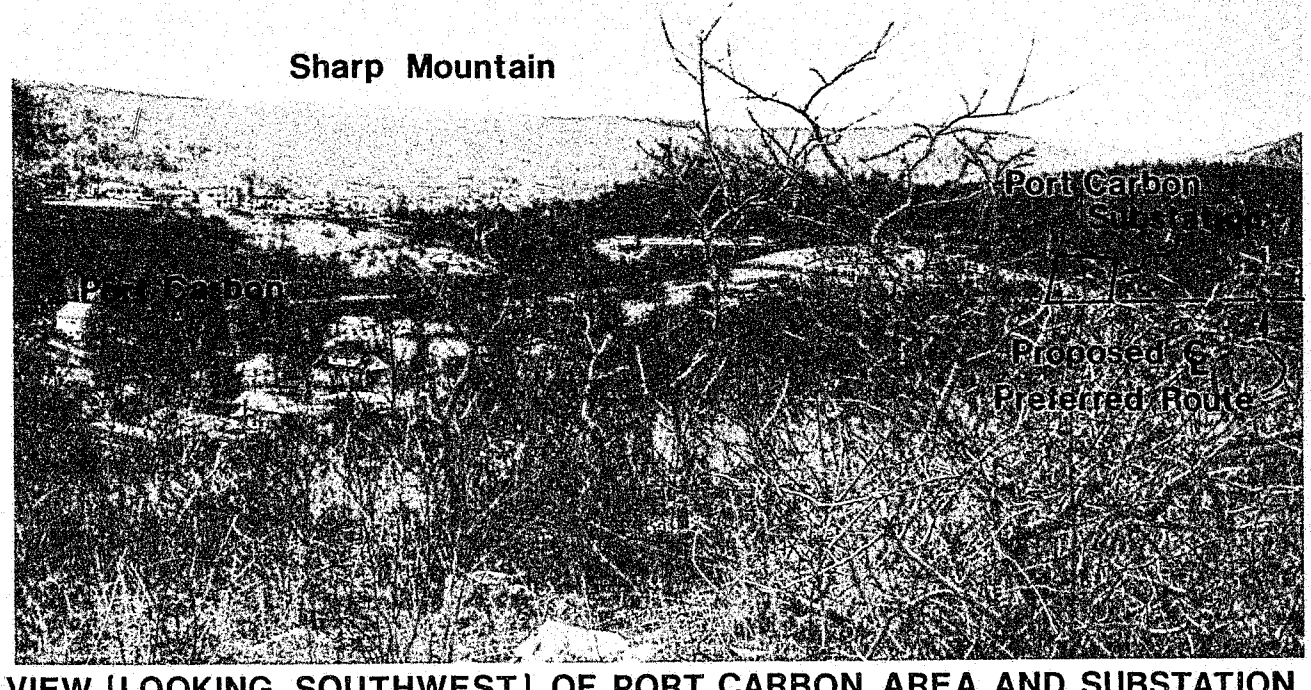
VIEW [LOOKING EAST] OF HAUTO-FRACKVILLE NO. 1 TO BE REBUILT AS PART OF SEGMENT B.



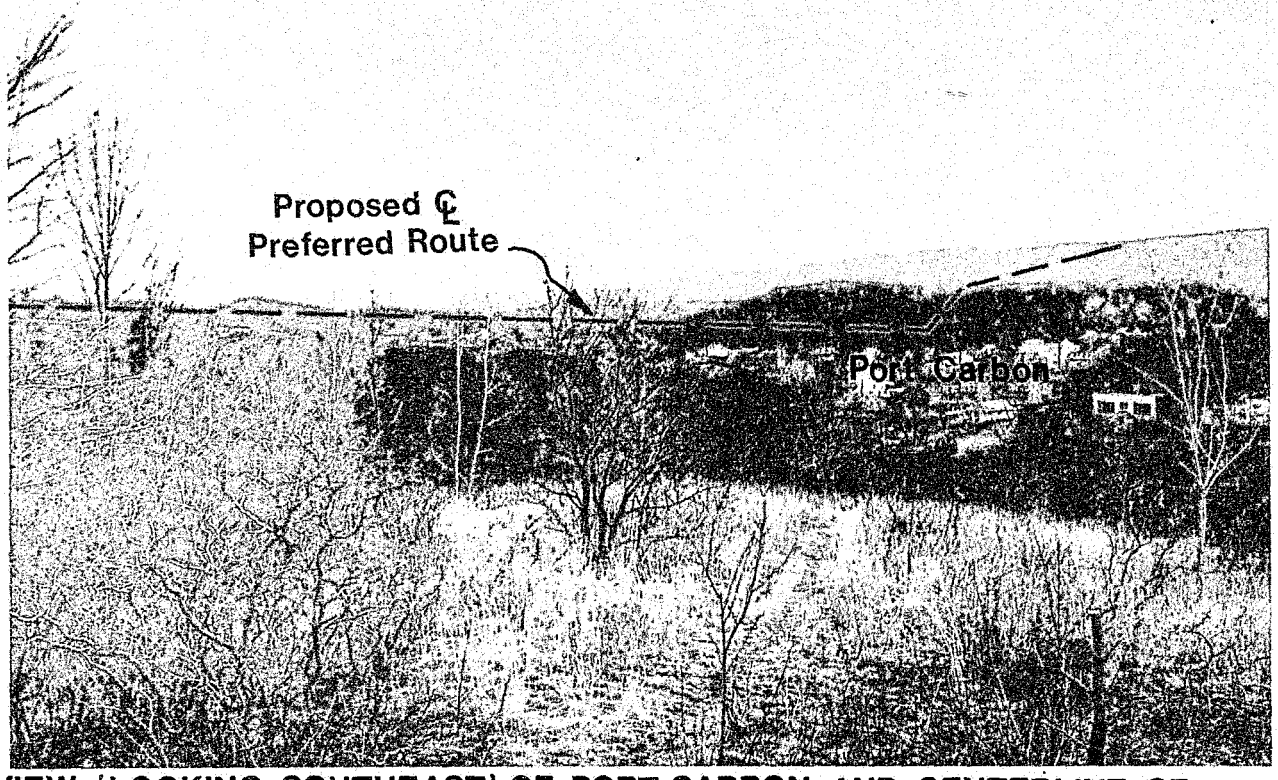
VIEW [LOOKING NORTH] ALONG PROPOSED CENTERLINE OF PREFERRED ROUTE - SEGMENT B NORTH OF LR 53087.



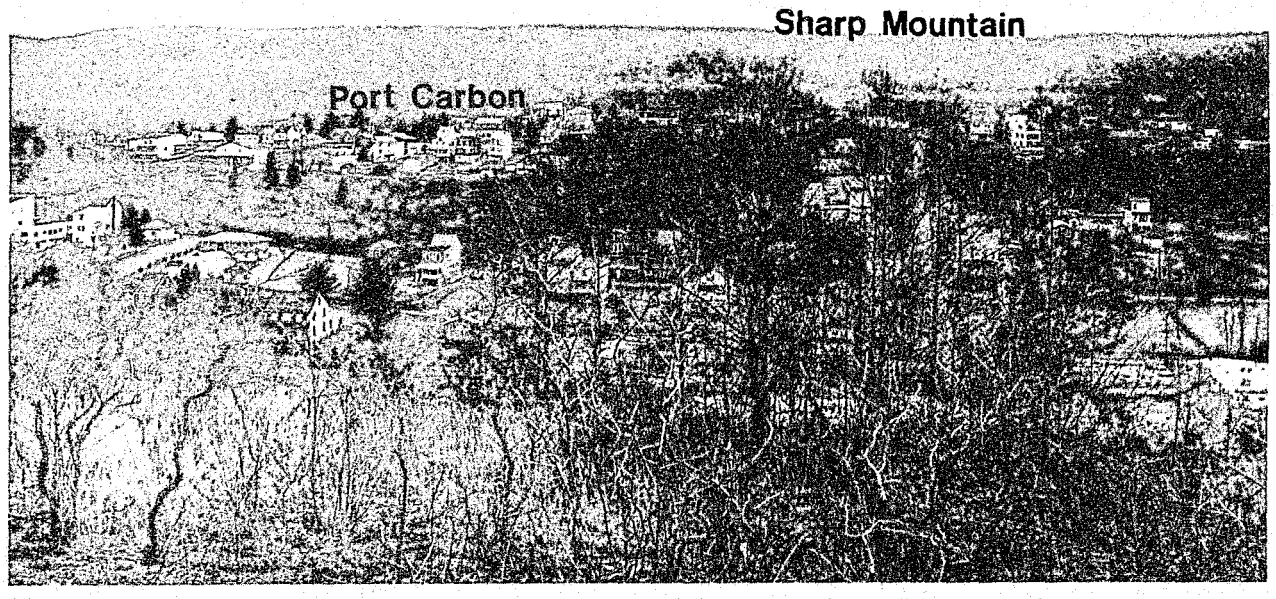
VIEW (LOOKING SOUTH) OF COAL COMPANY LANDS AND PORTION OF PORT CARBON BOROUGH WITH APPROXIMATE LOCATION OF PREFERRED ROUTE CENTERLINE - SEGMENTS B-F.



VIEW (LOOKING SOUTHWEST) OF PORT CARBON AREA AND SUBSTATION FROM HILLSIDE NORTH OF THE BOROUGH.



VIEW [LOOKING SOUTHEAST] OF PORT CARBON AND CENTERLINE OF PREFERRED ROUTE FROM HILLSIDE NORTH OF PORT CARBON.



VIEW [LOOKING SOUTH] OF PORT CARBON FROM HILLSIDE NORTH OF THE BOROUGH.

Segment D (Port Carbon to Orwigsburg Section)

This segment is depicted on page 88. South from the tap to Port Carbon, the line route borders a wooded suburban section of Port Carbon. The line route passes within 200 feet of a cemetery, 300 feet of a residence, and 100 feet of a commercial building. Located in a completely wooded area, the line will be screened from both the cemetery and the residence. The line crosses the road entrance to the cemetery, and a tree screen will be left at this crossing to mitigate visual impacts.

The commercial building, a fast food restaurant, is located on the south side of Route 209. The line crossed west of the restaurant, with the closest line structure being located approximately 300 feet from the building. Route 209 is a moderate volume highway in this area and a road screen will be left to mitigate the line crossing.

The line route then crosses the west branch of the Schuylkill River and continues south over Sharp Mountain, Tumble Run Creek, and the Schuylkill Haven Borough Reservoir watershed area.

The line route then passes over Second Mountain and south to an angle structure on the existing Orwigsburg Tap approximately 2 miles west of Orwigsburg Substation.

The north side of Sharp Mountain has a prominent ridge visible from the Borough of Port Carbon. Selecting a line route that traverses the mountain in a serrated (diagonal) fashion will mitigate the visual impact of the structures and "tunnel" effect of clearing on the right-of-way. Also, the steeply sloped areas on Sharp and Second Mountain will be crossed at an angle, to permit access road and structure site grading to be constructed according to PP&L's soil erosion and sedimentation specifications. All areas affected by road construction will be hydroseeded to promote prompt regrowth. In addition, strawbales will be used to control run-off wherever necessary.

The line crossings at Tumble Run Creek and the Schuylkill Haven Borough Reservoir watershed are sensitive areas. As shown on Applicant's Exhibit "C" - Map 3, Sheet 7, tailored clearing will be done at Tumble Run Creek. Access into the watershed area will be by an existing dirt road which enters the watershed area from LR 53099 Tumble Run Road. Where the proposed line crosses the dirt road, access will be gained to the right-of-way. Access north of Tumble Run Creek will be from LR 53099.

No herbicides will be used during initial clearing or future line maintenance through the entire watershed boundary area, as designated on Maps 7 and 8. Gorge areas will remain uncleared. Helicopters will be used to string conductors.

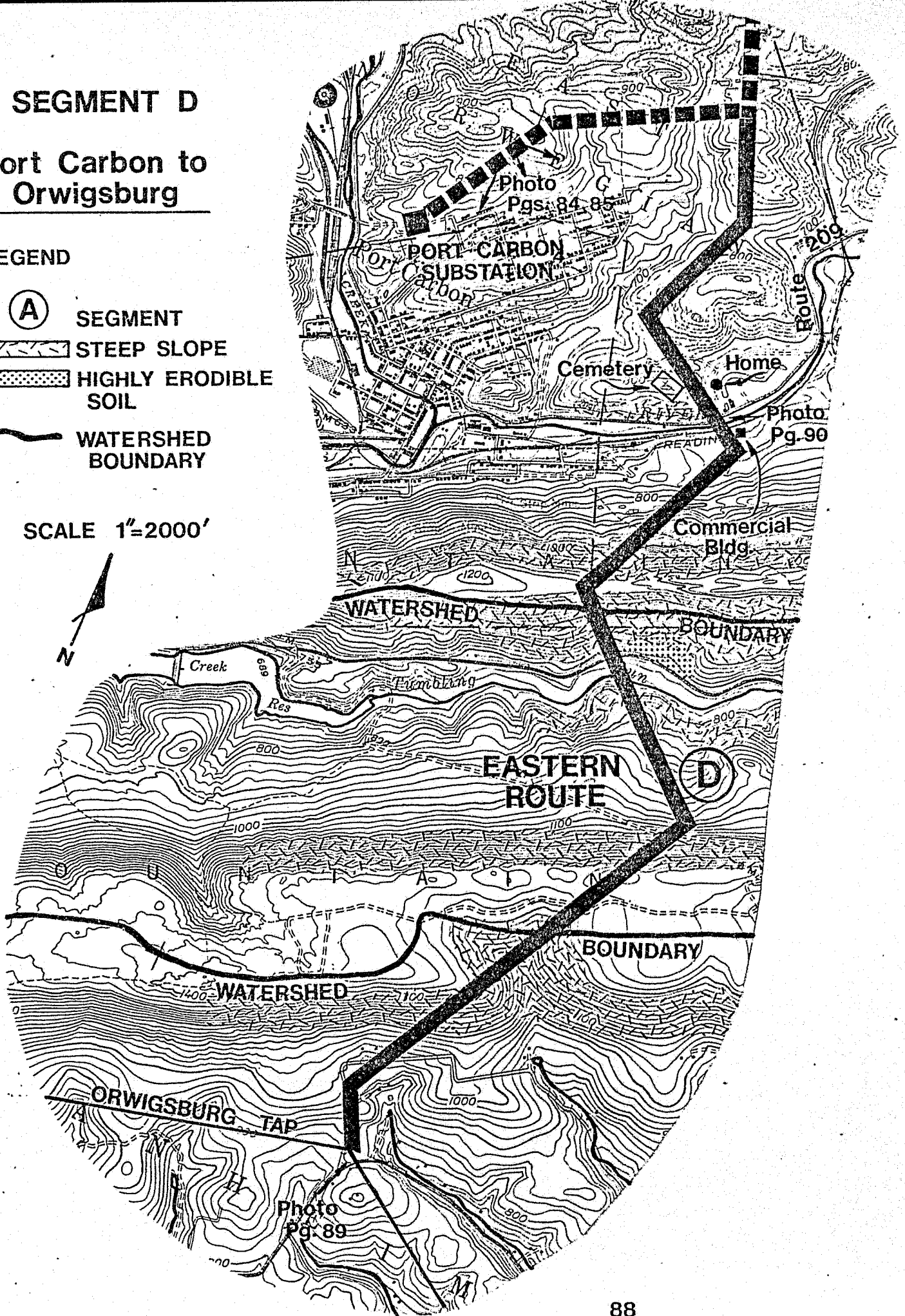
SEGMENT D

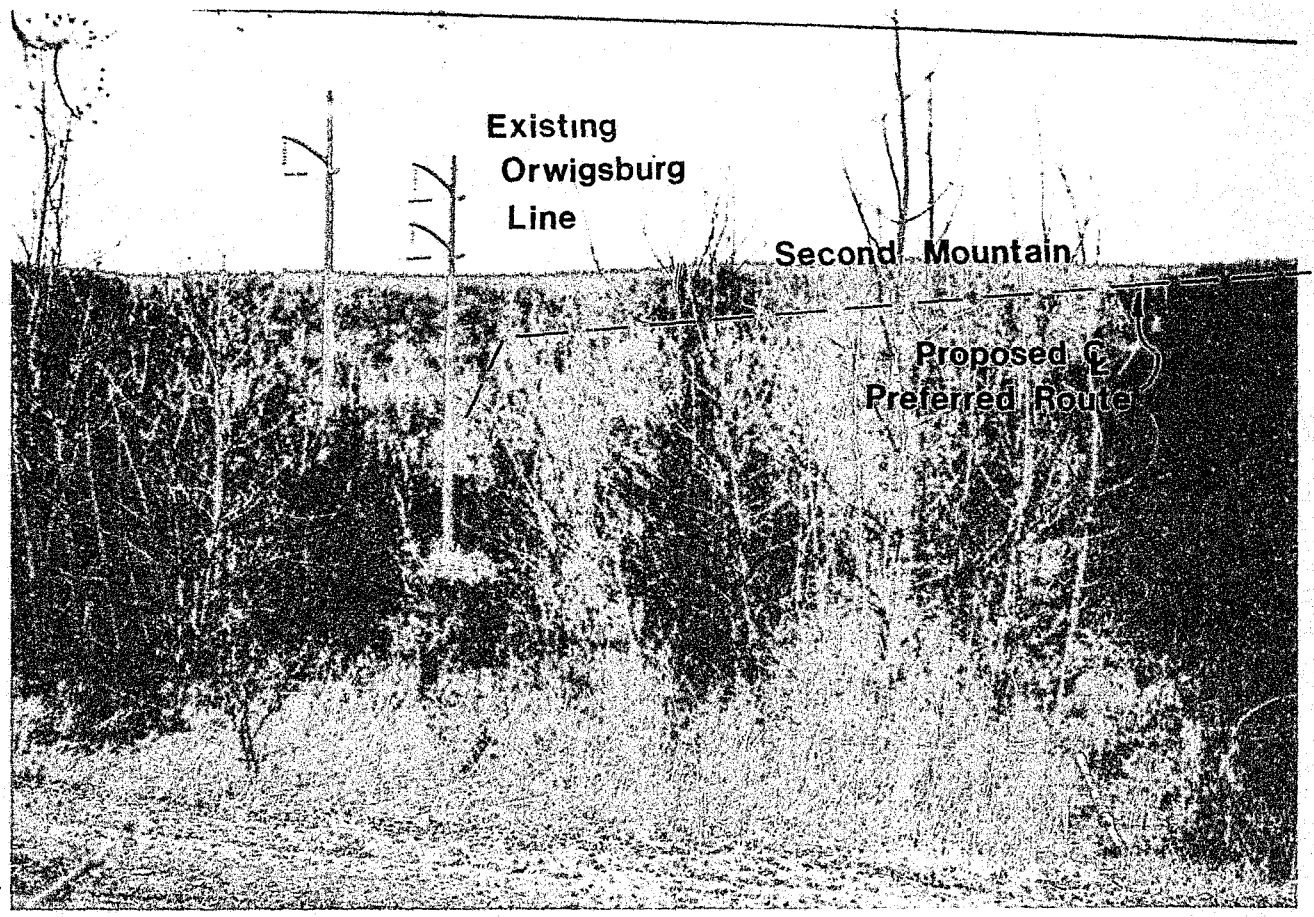
Port Carbon to Orwigsburg

LEGEND

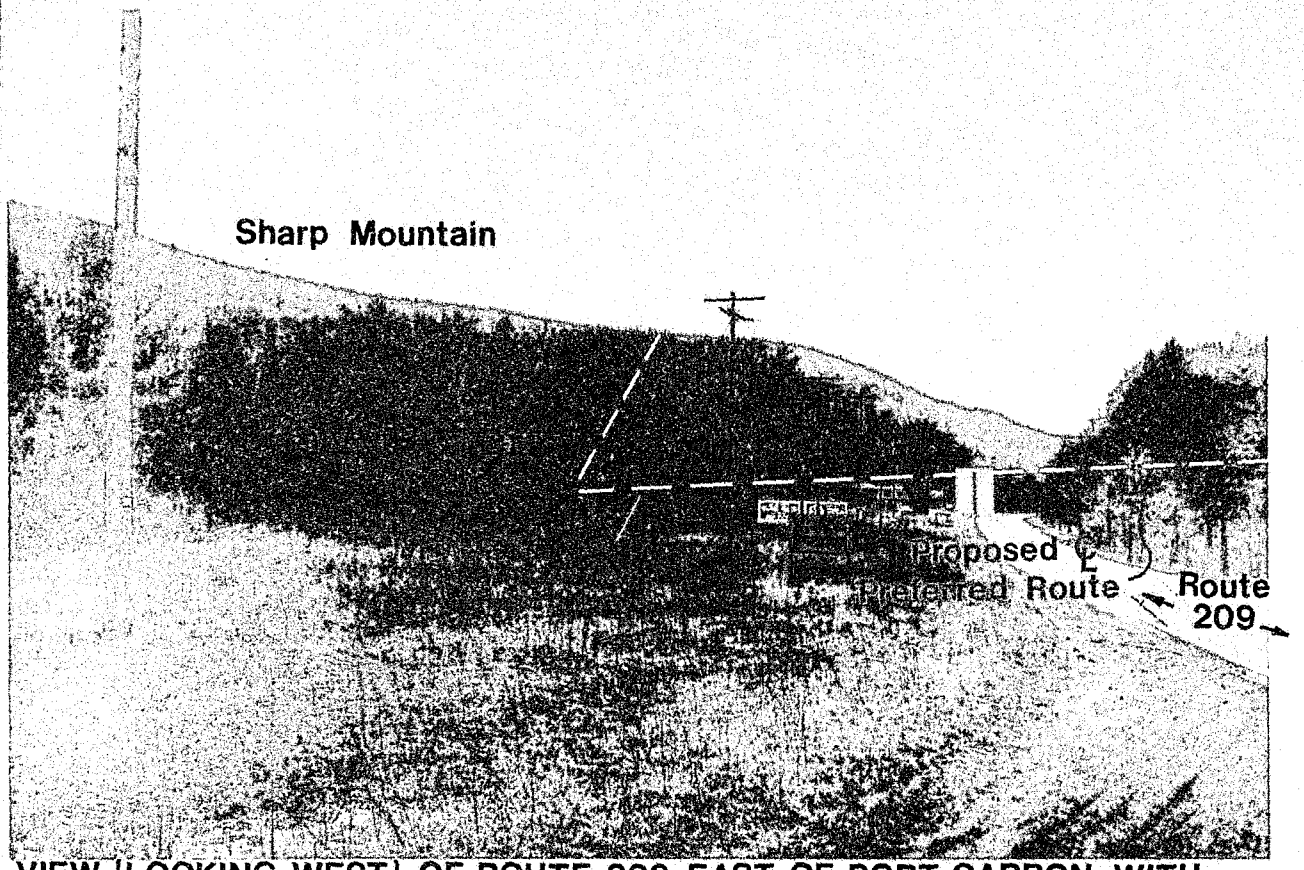
- (A) SEGMENT
- STEEP SLOPE
- HIGHLY ERODIBLE SOIL
- WATERSHED BOUNDARY

SCALE 1"=2000'

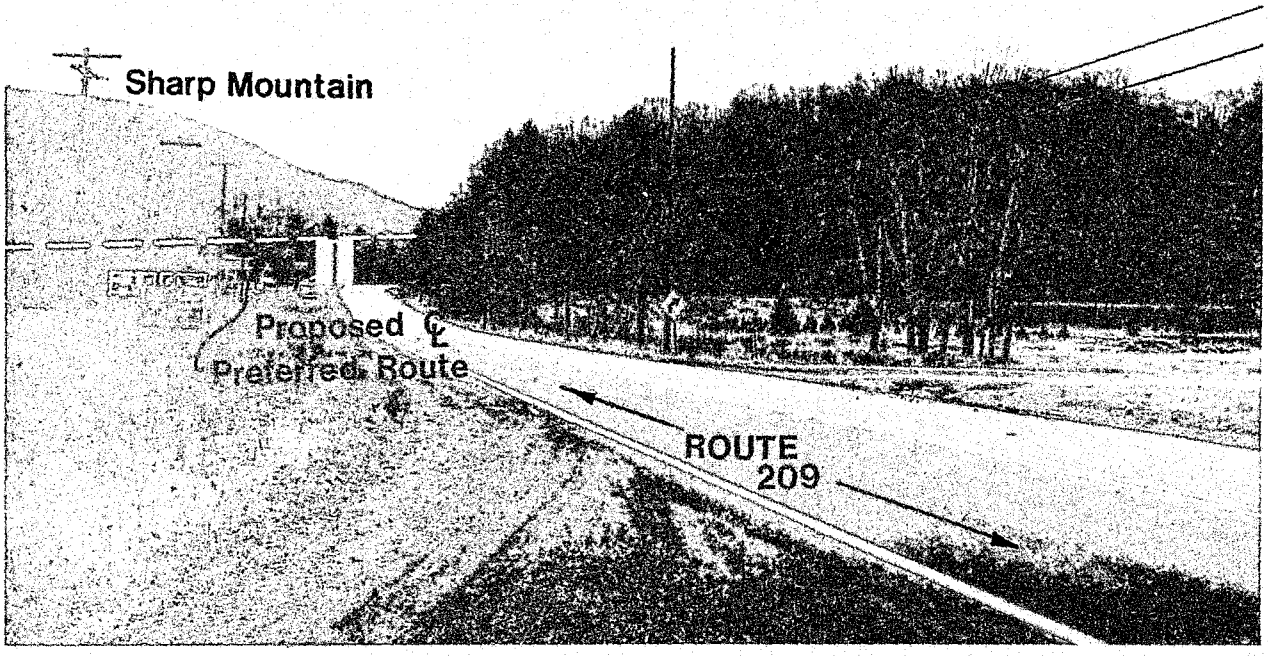




VIEW [LOOKING NORTH] OF EXISTING ORWIGSBURG ANGLE STRUCTURE WHERE PREFERRED ROUTE [SEGMENT D] WILL TERMINATE.



VIEW (LOOKING WEST) OF ROUTE 209 EAST OF PORT CARBON WITH APPROXIMATE LOCATION OF PREFERRED ROUTE CENTERLINE-SEGMENT D.



VIEW (LOOKING WEST) OF ROUTE 209 AND WOODED AREA EAST OF SAINT ANTHONY'S CEMETERY.

OTHER IMPACTS AND MITIGATIVE MEASURES TO BE USED ON THE EASTERN ROUTE

The preceding section analyses discussed impact and mitigations of the route on topography, mineral resources, land use, and visual exposure.

The following is a discussion on impacts and mitigating measures in the categories of Natural Resources, Vegetation, Wildlife and Aquatic Resources for the Eastern Route.

Natural Resources

Vegetation

Clearing on the right-of-way is required in all forested or high brush areas. PP&L's "Program For Vegetation Management" (PVM) includes measures to mitigate the effects of right-of-way clearing and maintenance.

Most of the line will be selectively cleared so as to remove all tall-growing forest species on the right-of-way while preserving low-growing ("desirable") species, as listed in Exhibit 5 of PVM. Several sensitive areas along the route will be "tailored-cleared", which involves where possible the topping and trimming of trees, rather than total removal. The areas to be tailored-cleared include all stream crossings, those minor road crossings near homes or visible from major roads, all major road crossings, and other areas determined to be visually and environmentally sensitive.

"Danger trees" outside the 100 foot right-of-way will be removed along the route pursuant to PP&L's "Program for Vegetation Management". Included are those trees which would strike the conductors or pass within the minimum required clearance (15') if they fell.

Herbicides will be used along most forested portions of the proposed line to prevent regrowth of tall-growing species. Herbicides will not be used on pasture lands, watershed areas, within 50 feet of streams, in wet areas with standing pools of water, or where prohibited by provisions of right-of-way agreements with land owners. Herbicides to be used are reviewed and selected each year from those approved by the EPA. All label precautions are followed.

When the line is initially cleared, all stumps will be treated using backpack or truck-based equipment. The 1979 program utilized a chemical solution consisting of three gallons of Banvel 520 to 97 gallons of #2 fuel oil.

Maintenance of the route will involve reclearing and respraying. All restrictions followed during initial clearing will also apply to maintenance procedures. This includes restrictions set forth in right-of-way agreements, which are reviewed prior to the start of maintenance work. The 1979 maintenance spray program used either Krenite or a solution of two quarts Weedone 2,4-DP, two quarts Amdon or Tordon 101, one quart Surfel, and one pint Lo-Drift to 100 gallons of water.

PP&L's policy is to notify all landowners prior to the start of line clearing and maintenance. Finally, an audit program is being established at PP&L to ensure proper line clearing.

Wildlife

The impact of the line will result from altering existing habitat of wildlife. Those affected by clearing of right-of-way can be classified as: negatively affected - removal of habitat; positively affected - creation of habitat; positively affected - diversity of habitats created.

Negatively affected are wildlife dependent to a great extent on forested area: e.g., squirrels, porcupine, raccoon, bats, and forest dwelling birds, such as wood thrushes, warblers, owls, woodpeckers, etc. Positively affected - creation of habitat examples are birds requiring brushland type communities. Positively affected - diversity of habitats created, occurs with the transition from wooded through the edge of the right-of-way to grassy-brush areas under the line. Examples of species utilizing these areas are ruffed grouse, wild turkey, eastern cottontail, and white-tailed deer.

SYSTEM ELECTRICAL BENEFITS - EASTERN ROUTE

Although it is not the primary System Planning objective, certain incidental benefits will result from the use of the preferred route.

The Eastern Route provides an optimum use of an existing transmission corridor by upgrading the facility for double circuit use at a higher voltage and a potential load carrying capability of 424 MVA. The existing 66 kV, single circuit facility is limited to 89 MVA load carrying capability.

Electrically, the route provides an eastern source to St. Clair, Port Carbon, Cressona, Schuylkill Haven areas that are now supplied from two central and a western sources. Concurrent with this concept is the possibility of supplying St. Clair Colliery Sub from the new line and the elimination of three miles of line. (See Map 1)

The Eastern Route has the potential for cost savings during construction with the diversity in structure design to meet the route location requirements.

The Eastern Route will provide a higher degree of reliability by establishing two-way supply to the Port Carbon 66-12 kV Area Substation, and reducing line exposure on the Orwigsburg Tap by approximately two miles.

45B/cak

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APPENDIX B

SCIENTIFIC NAMES OF PLANTS AND ANIMALS MENTIONED IN THE TEXT

Scientific Names of Plants and Animals Mentioned in the Text

PLANTS

Red maple
Acer rubrum

Sweet birch
Betula lenta

Graybirch
Betula populifolia

Chestnut
Castanea dentata

White ash
Fraxinus americana

Heath
Gaylassacia baccata

Small whorled pogonia
Isotria medeoloides

Rush
Juncus gymnocarpus
(formerly *J. smithii*)

Tulip poplar
Liriodendron tulipifera

Norway spruce
Picea abies

Red pine
Pinus resinosa

Pitch pine
Pinus rigida

White pine
Pinus strobus

Scotch pine
Pinus sylvestris

Trembling aspen
Populus tremuloides

White oak
Quercus alba

Scarlet oak
Quercus coccinea

Scrub oak
Quercus ilicifolia

Chestnut oak
Quercus prinus

Red oak
Quercus rubra

Black oak
Quercus velutina

Sumac
Rhus spp.

Sassafras
Sassafras albidum

Spreading globe-flower
Trollius laxus

Hemlock
Tsuga canadensis

Heath
Vaccinium vacillans

FISH

Black bass
Micropterus spp.

Brook trout
Salvelinus fontinalis

Sunfish
Lepomis spp.

AMPHIBIANS

American toad
Bufo americanus

Wood frog
Rana sylvatica

Spring peeper
Hyla crucifer

Spotted salamander
Ambystoma maculatum

Northern dusky salamander
Desmognathus fuscus

Red-backed salamander
Plethodon cinereus

Northern two-lined salamander
Eurycea bislineata

REPTILES

Northern water snake
Nedodia sipedon

Northern black racer
Coluber constrictor

Black rat snake
Elaphe obsoleta

Northern copperhead
Agkistrodon contortrix

Snapping turtle
Chelydra serpentina

Bog turtle
Clemmys muhlenbergi

BIRDS

Ruffed grouse
Bonasa umbellus

Ring-necked pheasant
Phasianus colchicus

Mourning dove
Zenaida macroura

Wild turkey
Meleagris gallopavo

Woodcock
Philohela minor

Bald eagle
Haliaeetus leucocephalus

Peregrine falcon
Falco peregrinus

Kirtland's warbler
Dendroica kirtlandii

MAMMALS

Opposum
Didelphis virginiana

Short-tailed shrew
Blarina brevicauda

Eastern cottontail
Sylvilagus floridanus

New England cottontail
Sylvilagus transitionalis

Indiana bat
Myotis sodalis

Delmarva fox squirrel
Sciurus niger

White-footed mouse
Peromyscus leucopus

Meadow vole
Microtus pennsylvanicus

Red-backed vole
Clethrionomys gapperi

Muskrat
Ondatra zibethicus

Eastern gray squirrel
Sciurus carolinensis

Meadow jumping mouse
Zapus hudsonius

Red fox
Vulpes fulva

Racoon
Procyon lotor

White-tailed deer
Odocoileus virginianus

APPENDIX C

SUPPLEMENTAL BIRD TABLES

Appendix Table C-1

U.S. Fish and Wildlife Service Breeding Bird Survey Route Located in Southwest Schuylkill County, PA.

Rock dove
Columba livia

Mourning dove
Zenaida macroura

Belted kingfisher
Megaceryle alcyon

Common flicker
Colaptes auratus

Eastern phoebe
Sayornis phoebe

Eastern wood pewee
Contopus virens

Barn swallow
Hirundo rustica

Blue jay
Cyanocitta cristata

Common crow
Corvus brachyrhynchos

Tufted titmouse
Parus bicolor

House wren
Troglogytes aedon

Mockingbird
Mimus polyglottos

Gray catbird
Dumetella carolinensis

American robin
Turdus migratorius

Starling
Sturnus vulgaris

Yellow warbler
Dendroica petechia

Ovenbird
Seiurus aurocapillus

Kentucky warbler
Oporornis formosus

Common yellowthroat
Geothlypis trichas

House sparrow
Passer domesticus

Red-winged blackbird
Agelaius phoeniceus

Northern oriole
Icterus galbula

Common grackle
Quiscalus quiscula

Brown-headed cowbird
Molothrus ater

Scarlet tanager
Piranga olivacea

Cardinal
Cardinalis cardinalis

Indigo bunting
Passerina cyanea

American goldfinch
Carduelis tristis

Chipping sparrow
Spizella passerina

Field sparrow
Spizella pusilla

Red-eyed vireo
Vireo olivaceus

Song sparrow
Melospiza melodia

Appendix Table C-2

Compilation of Three U.S. Fish and Wildlife Service Breeding Bird Surveys from Eastern Schuylkill County, PA.

Northern green heron
Butorides striatus

Canada goose
Branta canadensis

Mallard
Anas platyrhynchos

Turkey vulture
Cathartes aura

Red-tailed hawk
Buteo jamaicensis

Broad-winged hawk
Buteo platypterus

American kestrel
Falco sparverius

Screech owl
Otus asio

Ring-necked pheasant
Phasianus colchicus

Killdeer
Charadrius vociferus

Spotted sandpiper
Actitis macularia

Rock dove
Columba livia

Mourning dove
Zenaida macroura

Yellow-billed cuckoo
Coccyzus americanus

Black-billed cuckoo
Coccyzus erythropthalmus

Belted kingfisher
Megaceryle alcyon

Common flicker
Colaptes auratus

Hairy woodpecker
Picoides villosus

Downy woodpecker
Picoides pubescens

Eastern kingbird
Tyrannus tyrannus

Great crested flycatcher
Myiarchus crinitus

Eastern phoebe
Sayornis phoebe

Willow flycatcher
Empidonax traillii

Least flycatcher
Empidonax minimus

Eastern wood pewee
Contopus virens

Horned lark
Eremophila alpestris

Barn swallow
Hirundo rustica

Cliff swallow
Petrochelidon pyrrhonota

Tree swallow
Iridoprocne bicolor

Rough-winged swallow
Stelgidopteryx ruficollis

Chimney swift
Chaetura pelagica

Blue jay
Cyanocitta cristata

Common crow
Corvus brachyrhynchos

Fish crow
Corvus ossifragus

Black-capped chickadee
Parus atricapillus

Tufted titmouse
Parus bicolor

White-breasted nuthatch
Sitta carolinensis

House wren
Troglodytes aedon

Carolina wren
Thryothorus ludovicianus

Mockingbird
Mimus polyglottos

Gray catbird
Dumetella carolinensis

Brown thrasher
Toxostoma rufum

American robin
Turdus migratorius

Wood thrush
Hylocichla mustelina

Veery
Catharus fuscescens

Eastern bluebird
Sialia sialis

Blue-gray gnatcatcher
Polioptila caerulea

Purple martin
Progne subis

Cedar waxwing
Bombycilla cedrorum

Starling
Sturnus vulgaris

Yellow-throated vireo
Vireo flavifrons

Red-eyed vireo
Vireo olivaceus

Warbling vireo
Vireo gilvus

Black-and-white warbler
Mniotilta varia

Golden-winged warbler
Vermivora chrysoptera

Blue-winged warbler
Vermivora pinus

Yellow warbler
Dendroica petechia

Magnolia warbler
Dendroica magnolia

Chestnut-sided warbler
Dendroica pensylvanica

Prairie warbler
Dendroica discolor

Ovenbird
Seiurus aurocapillus

Louisiana waterthrush
Seiurus motacilla

Common yellowthroat
Geothlypis trichas

Yellow-breasted chat
Icteria virens

Golden-crowned kinglet
Regulus satrapa

American redstart
Setophaga ruticilla

House sparrow
Passer domesticus

Bobolink
Dolichonyx oryzivorus

Eastern meadowlark
Sturnella magna

Red-winged blackbird
Agelaius phoeniceus

Northern oriole
Icterus galbula

Common grackle
Quiscalus quiscula

Brown-headed cowbird
Molothrus ater

Scarlet tanager
Piranga olivacea

Cardinal
Cardinalis cardinalis

Indigo bunting
Passerina cyanea

Rose-breasted grosbeak
Pheucticus ludovicianus

Purple finch
Carpodacus purpureus

House finch
Carpodacus mexicanus

American goldfinch
Carduelis tristis

Rufous-sided towhee
Pipilo erythrophthalmus

Savannah sparrow
Passerculus sandwichensis

Canada warbler
Wilsonia canadensis

Grasshopper sparrow
Ammodramus savannarum

Vesper sparrow
Pooecetes gramineus

Chipping sparrow
Spizella passerina

Field sparrow
Spizella pusilla

White-throated sparrow
Zonotrichia albicollis

Swamp sparrow
Melospiza georgiana

Song sparrow
Melospiza melodia

Appendix Table C-3

Avian Species Reported on the 1977 Christmas Bird Count, Hamburg, PA (American Birds Vol. 32(4): 552).

Great blue heron - 4
Ardea herodias

Canada goose - 1729
Branta canadensis

Mallard - 82
Anas platyrhynchos

Black duck - 10
Anas rubripes

Gadwall - 29
Anas strepera

American widgeon - 2
Anas americana

Redhead - 1
Aythya americana

Ring-necked duck - 1
Aythya collaris

Lesser scaup - 16
Aythya affinis

Common goldeneye - 2
Bucephala clangula

Oldsquaw - 1
Clangula hyemalis

Common merganser - 4
Mergus merganser

Goshawk - 3
Accipiter gentilis

Sharp-shinned hawk - 3
Accipiter striatus

Red-tailed hawk - 92
Buteo jamaicensis

Marsh hawk - 1
Circus cyaneus

American kestrel - 61
Falco sparverius

Ruffed grouse - 6
Bonasa umbellus

Ring-necked pheasant - 104
Phasianus colchicus

Killdeer - 15
Charadrius vociferus

Common snipe - 4
Capella gallinago

Herring gull - 139
Larus argentatus

Rock dove - 934
Columba livia

Mourning dove - 1034
Zenaida macroura

Barn owl - 2
Tyto alba

Screech owl - 10
Otus asio

Great horned owl - 8
Bubo virginianus

Belted kingfisher - 15
Megaceryle alcyon

Common flicker - 5
Colaptes auratus

Pileated woodpecker - 1
Dryocopus pileatus

Rough-legged hawk - 7
Buteo lagopus

Red-headed woodpecker - 1
Melanerpes erythrocephalus

Hairy woodpecker - 14
Picoides villosus

Downey woodpecker - 117
Picoides pubescens

Horned lark - 120
Eremophila alpestris

Blue jay - 191
Cyanocitta cristata

Common crow - 3137
Corvus brachyrhynchos

Fish crow - 94
Corvus ossifragus

Black-capped chickadee - 349
Parus atricaphillus

Tufted titmouse - 144
Parus bicolor

White-breasted nuthatch - 109
Sitta carolinensis

Red-breasted nuthatch - 3
Sitta canadensis

Brown creeper - 8
Certhia familiaris

Winter wren - 1
Troglodytes troglodytes

Carolina wren - 1
Thryothorus ludovicianus

Mockingbird - 57
Mimus polyglottos

American robin - 43
Turdus migratorius

Red-bellied woodpecker - 4
Melanerpes carolinus

Eastern bluebird - 6
Sialia sialis

Golden-crowned kinglet - 9
Regulus satrapa

Cedar waxing - 110
Bombycilla cedrorum

Starling - 4454
Sturnus vulgaris

Yellow-rumped warbler - 4
Dendroica coronata

House sparrow - 838
Passer domesticus

Red-winged blackbird - 48
Agelaius phoeniceus

Rusty blackbird - 6
Euphagus carolinus

Common grackle - 222
Quiscalus quiscula

Brown-headed cowbird - 242
Molothrus ater

Cardinal - 152
Cardinalis cardinalis

Evening grosbeak - 457
Hesperiphona vespertina

Purple finch - 45
Carpodacus purpureus

House finch - 214
Carpodacus mexicanus

Pine grosbeak - 2
Pinicola enucleator

Common redpoll - 10
Carduelis flammea

Hermit thrush - 1
Catharus guttata

American goldfinch - 282
Carduelis tristis

Dark-eyed junco - 1267
Junco hyemalis

Tree sparrow - 1237
Spizella arborea

Field sparrow - 53
Spizella pusilla

White-throated sparrow - 601
Zonotrichia albicollis

Swamp sparrow - 2
Melospiza georgiana

Song sparrow - 151
Melospiza melodia

Pine siskin - 195
Carduelis pinus

APPENDIX D

SUMMARIZATION OF ZONING CATEGORIES

Summarization of Zoning Categories

Zoning for Schuylkill County was obtained from local zoning maps of boroughs and townships. Where there was no local zoning, Schuylkill County Zoning was in effect. The following list shows how the local and county zoning district categories were combined and coordinated with the zoning categories presented on Map 9. They were combined because zoning categories were not consistent from one locality to another.

ZONING CATEGORIES ON MAP 9	CORRESPONDING BOROUGH, TOWNSHIP OR COUNTY ZONING DISTRICT CATEGORIES
Conservation	Conservation District
	Watersheds
	Open Space
Agriculture	Agriculture Districts
Mining	Mining
Residential-Agricultural	Residential-Agricultural
Rural Residential	Rural Residential
	Low Density Residential
Single Residential	Single Family Residential
	Medium Density Residential
Multiple Residential	Multiple Family Residential
	Two Family Residential
	High Density Residential
Industrial	Industrial
	General Industrial
	Light Industrial
	Heavy Industrial
Commercial	Neighborhood Commercial
	Central Commercial

	Central Business Commercial
	Community Commercial District
	General Commercial
	Traveler's Commercial
	Highway Commercial
Special Purpose District	Special Purpose District

APPENDIX E

ANNOTATED LIST OF CULTURAL RESOURCES SITES

Annotated List of Cultural Resources Sites

The following is an annotated list of the cultural resources indicated on Map 12. The list contains the names and locations of National Register Places, Pennsylvania historical sites, local historic sites, and potential and known archaeological sites.

National Register Places

John O'Hara House, 607 Mahantango Street, Pottsville

Cloud House, 351 South Second Street, Pottsville

Possible National Register Places

Adamsdale late archaic archaeological site - over 1000 artifacts recovered.

Pennsylvania Historic Sites

Bowstrong Truss Bridge, Routes 209 and 61, Pottsville (c. 1870)

Douglass House, 201 South Warren Street, Orwigsburg

Redbrick Church, Friedens Kirche, Minersville vicinity (1856)

Schuylkill County Court House, Pottsville (1189-1890)

Schuylkill County Prison, Pottsville (1851, 1876)

Victorian Houses, 315 and 317 South Center Street, Pottsville (late 1800's).

Yuengling Brewery, West Mahantango Street, Pottsville (mid 1800's)

Valley Furnace, Route 209, East End of New Philadelphia (1836)

Other Historical Sites

Reading Railroad in Pottsville Region

Near Seltzer, Necho Allen discovered coal

Near Orwigsburg, French and Indian War massacre site

Zion Church, Route 61 near Orwigsburg

Frederick Hesser grave, Orwigsburg

Victorian House in Port Carbon

OVERSIZE

Documents

APPLICATION EXHIBIT 'C'

FRACKVILLE-ORWIGSBURG

138 kV TRANSMISSION LINE

DEPICTIONS OF PROPOSED LINE ROUTE

PREPARED BY:

PENNSYLVANIA POWER AND LIGHT CO.

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