CAPTION SHEET CA MANAGEMENT SYSTEM

1. REPORT DATE: 00/00/00	
2. BUREAU: FUS	
3. SECTION(S):	4. PUBLIC MEETING DATE: 00/00/00
5. APPROVED BY:	
DIRECTOR:	
SUPERVISOR:	
6. PERSON IN CHARGE:	7. DATE FILED: 02/03/05
8. DOCKET NO: A-110500 F0351	9. EFFECTIVE DATE: 00/00/00

PARTY/COMPLAINANT: PEQUEA TOWNSHIP, LANCASTER COUNTY

RESPONDENT/APPLICANT: PPL ELECTRIC UTILITIES CORP

COMP/APP COUNTY: UTILITY CODE: 110500

ALLEGATION OR SUBJECT

LETTER OF NOTIFICATION OF PPL ELECTRIC UTILITIES CORPORATION FILED PURSUANT TO 52 PA CODE CHAPTER 57 SUBCHAPTER G WITH RESPECT TO THE MANOR-SOUTH AKRON 230 KV LINE MODIFICATION TO BE CONSTRUCTED IN PEQUEA TOWNSHIP, LANCASTER COUNTY.

Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Tel: 215.963.5000
Fax: 215.963.5001
www.morganlewis.com

Morgan Lewis
COUNSELORS AT LAW

ORIGINAL

Anthony C. DeCusatis
215.963.5034
tdecusatis@morganlewis.com

February 3, 2005

VIA FEDERAL EXPRESS

James J. McNulty, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

DOCUMENT FOLDER

Re: **Letter Of Notification Of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To The Manor-South Akron 230 kV Line Modification To Be Constructed In Pequea Township, Lancaster County**

Dear Secretary McNulty: A-110500F0351

Enclosed for filing in the above-captioned matter are an original and six (6) copies of PPL Electric Utilities Corporation's ("PPL") Letter of Notification requesting approval to construct modifications to the Manor-South Akron 230 kV Transmission Line. This Letter of Notification is filed pursuant to the Commission's regulations at 52 Pa. Code Section 57.72(d).

Copies of the Letter of Notification have been served upon the parties listed on the attached Certificate of Service. The enclosed documents are to be deemed filed on the date shown above, which is the date they were deposited with an overnight express delivery service as shown on the delivery receipt attached to the mailing envelope.

DOCKETED
RECEIVED FEB 09 2005
FEB 03 2005

Also enclosed is an additional copy of the Letter of Notification, which we request that you date stamp as evidence of filing and return to us in the stamped, self-addressed envelope provided for that purpose.

Very truly yours,

Anthony C. DeCusatis

Enclosure

c: Darren Gill

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G With Respect to the Manor-South Akron 230 kV Line Modification to be Constructed in Pequea Township, Lancaster County	:	**Docket No.** A-110500 F0351

CERTIFICATE OF SERVICE

I hereby certify that I have, this 3rd day of February, 2005, served true and correct copies of the Letter of Notification and accompanying Exhibit Nos. A, B and C upon the persons and in the manner listed below.

BY CERTIFIED MAIL/RETURN RECEIPT REQUESTED

(GOVERNMENTAL AGENCIES)

Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Division of Archaeology and Protection
P.O. Box 1026
Harrisburg, PA 17108-1026
Attn: Mr. Kurt W. Carr, Chief

Commonwealth of Pennsylvania
Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, PA 17120
Attn: The Honorable Allen D. Biehler, Secretary

Department of Environmental Protection
P.O. Box 2063
Market Street State Office Building
Harrisburg, PA 17105-2063
Attn: Office of Field Operations

Lancaster County Commissioners
50 N. Duke Street
P.O. Box 83480
Lancaster, PA 17608-3480
Attn: Mr. Howard Shaub, Chair

Lancaster County Planning Commission
50 N. Duke Street
P.O. Box 83480
Lancaster, PA 17608-3480
Attn: Mr. Ronald Bailey, Executive Director

Pequea Township Board of Supervisors
1028 Millwood Road
Willow Street, PA 17584
Attn: Ms. Virginia Brady, Chairperson

Pequea Township Planning Commission
1028 Millwood Road
Willow Street, PA 17584
Attn: Mr. Robert Heckrote, Chairperson

Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

February 3, 2005

ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Re: Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To The Manor-South Akron 230 kV Line Modification To Be Constructed In Pequea Township, Lancaster County	:	Docket No. A-110500 F03 S1

LETTER OF NOTIFICATION

1. This Letter of Notification is filed pursuant to 52 Pa. Code §57.72(d)(1)(vi) to request the approval of the Pennsylvania Public Utility Commission ("Commission") to construct certain modifications to the Manor-South Akron 230 kV Line in Pequea Township, Lancaster County to provide the source of electrical supply to the proposed Millwood 230-69 kV Substation, which will also be located in Pequea Township. The project has a required in service in May 2007. Accompanying this Letter of Notification is a separately bound volume containing Exhibits A-C and Appendices A-D, which provide additional information about the project. This Letter of Notification and the accompanying Exhibits and Appendices, which are incorporated herein by reference, contain all of the information required by 52 Pa. Code § 57.72(d)(4).

DOCUMENT FOLDER

2. The applicant is PPL Electric Utilities Corporation ("PPL"), Two North Ninth Street, Allentown, Pennsylvania 18101, a public utility incorporated in Pennsylvania for the purpose of supplying light, heat and power to the public by means of electricity in all or portions of twenty-nine counties in eastern-central Pennsylvania.

RECEIVED
FEB 0 8 2005
PA PUBLIC UTILITY COMMISSION
DOCKETED
FEB 0 9 2005

3. PPL's attorneys are:

David B. MacGregor
Anthony C. DeCusatis
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, Pennsylvania 19103
215.963.5034 (T) 215.963.5001(Fax)

Paul E. Russell
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, Pennsylvania 18101
610.774.4254 (T) 610.774.6726 (Fax)

PPL's attorneys are authorized to receive all notices and communications regarding this Letter of Notification.

4. PPL proposes to modify the Manor-South Akron 230 kV Transmission Line by sectionalizing the existing line and connecting it to the proposed Millwood 230-69 kV Substation via two new 1,500-foot tap lines. Two new 69 kV connecting lines will connect the 69 kV side of the proposed Millwood Substation to the existing Face Rock-Engleside #1 and #2 69 kV Transmission Line.[1] The 230 kV tap lines, the proposed Millwood 230-69 kV Substation and the associated 69 kV connecting lines are needed to provide an additional source of supply to the 69-12 kV substations that serve customers in the area. The addition of this new source of supply will alleviate potential overload conditions on PPL's existing 69 kV facilities. Without this project, potential overloading concerns would arise by the Summer of 2007 when, in the event of an outage of either one of the Manor-Engleside #1 or #2 69 kV Line, the forecasted peak load would exceed even the emergency capacity rating of the line that remained in service. A detailed

[1] Siting approval is not required for the 69 kV connecting lines because they do not meet the threshold (above 100 kV) established by the Commission's regulations at 53 Pa. Code §57.1 and 57.71.

explanation of the need for this project, including drawing of the existing and proposed facilities, is set forth in Exhibit A.

5. As previously explained, PPL plans to sectionalize the existing Manor-South Akron 230 kV Line and connect it to the proposed Millwood 230-69 kV Substation by constructing two 1,500-foot 230 kV tap lines. After the Manor-South Akron 230 kV Line has been sectionalized, the two sections on either side of the Millwood Substation will be named the Manor-Millwood 230 kV Transmission Line and the South Akron-Millwood 230 kV Transmission Line. Each of the two new tap lines will be supported by three single shaft steel poles with an average height of 125 feet. Three power conductors and one overhead ground wire will be installed for each tap line. The power conductors will be 1590 KCMIL 45/7 stand ACRS. The overhead ground wire will be ½- inch extra-high strength steel.

6. The project will be designed, constructed, operated and maintained in a manner that satisfies or surpasses *National Electrical Safety Code* ("*NESC*") standards, PPL's design criteria and safety practices, and all applicable legal requirements. The proposed project will not create an unreasonable risk of danger to the public health or safety. A description of NESC standards and PPL's design criteria and safety practices is set forth in Appendix A. Minimum conductor-to-ground clearances will be 32 feet, as more fully explained in Exhibit B.

7. Approximately 3.9 acres of right-of-way will be acquired from Pequea Township in order to construct the 230 kV tap lines from the Manor-South Akron 230 Transmission Line to the proposed Millwood Substation. Pequea Township has agreed to convey the necessary right-of-way to PPL. PPL also has an agreement to acquire the land needed for the Millwood Substation.

8. The project described herein is proposed to begin as soon after obtaining the Commission's siting approval as is necessary to support the required in service date in May 2007. The estimated cost of the 230 kV tap lines is $710,200.

9. The construction of the 230 kV tap lines will have few, if any, impacts because the tap lines are in close proximity to both the Manor-South Akron 230 kV Transmission Line and the site of the proposed Millwood Substation. For most of their length, the tap lines will be located on agricultural land. The closest residences are approximately 1,200 feet from the proposed tap lines. The tap lines will not cross any roads nor will they affect any railroads, pipelines, communications towers or other utilities. The Smoketown Airport and the Columbia Airport are is approximately 8.8 miles and 10.3 miles, respectively, away from the project area. Consequently, neither airport will be affected by the proposed project.

10. A project review by the Pennsylvania Historical Museum and Commission has determined that this project will have no effect on archeological resources. There are no places of historic or cultural interest that will be affected by the project.

11. The project will not affect any unique geological, scenic or natural areas. No National Natural Landmarks, parks, or recreational facilities are located near the project area. The line modifications will not cross any wetlands or other aquatic resources. In conducting the work necessary for this project, PPL will employ, as appropriate, the mitigating measures set forth in its "Program for Vegetation Management" and "Specifications for Soil Erosion and Sedimentation Control for Transmission Line Rights-of-Way." In addition, PPL has coordinated with various state and federal agencies and determined that no threatened or endangered plant or animal species will be affected by the project. PPL's environmental assessment of the proposed relocation is set forth in Exhibit C.

12. A copy of this Letter of Notification is being served in accordance with the provisions of 52 Pa. Code §57.72(d)(3).

13. As soon as practicable after the filing of this Letter of Notification, PPL will publish notice of the filing in newspapers of general circulation in the area of the proposed project. Such notice will contain: (a) the date this Letter of Notification was filed with the Commission; (b) a brief description of the project and its location; (c) locations where the complete Letter of Notification may be reviewed by the public; and (d) an instruction that the interested parties should contact, within 15 days, James J. McNulty, Secretary, at the Commission's Harrisburg address.

14. This Letter of Notification is filed on the date set forth below. As provided in 52 Pa. Code § 57.72(d)(5), the Commission will review and, by order, approve or disapprove this Letter of Notification. If the Commission approves this Letter of Notification, the proposed project will be constructed as proposed herein without the formal application process set forth at 52 Pa. Code §57.71 *et seq.* If the Commission does not approve this Letter of Notification, the Commission's Order shall direct PPL to file for approval to construct the proposed project pursuant to the Commission's formal certification regulations.

WHEREFORE, PPL respectfully requests that the Commission approve the construction of modification of the Manor-South Akron 230 kV Transmission Line as proposed herein.

Respectfully submitted,

David B. MacGregor
Anthony C. DeCusatis
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103

Paul E. Russell
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, PA 18101

Attorneys for PPL Electric Utilities Corporation

Dated: February 3, 2005

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
: SS
COUNTY OF LEHIGH :
)

JOHN F. SIPICS, being duly sworn according to law, deposes and says that he is President of PPL Electric Utilities Corporation; that he is authorized to and does make this affidavit for it; and that the facts set forth above are true and correct to the best of his knowledge, information and belief and he expects PPL Electric Utilities Corporation to be able to prove the same at hearing hereof.

John F. Sipics

Sworn to and subscribed
before me this 31 day
of January, 2005

Therese M. Schaller

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Therese M. Schaller, Notary Public
City Of Allentown, Lehigh County
My Commission Expires Nov. 8, 2007
Member, Pennsylvania Association Of Notaries

ORIGINAL

ppl

Before the
Pennsylvania Public Utility Commission

Manor-South Akron 230 kV Line Modification

DOCUMENT FOLDER

Letter of Notification

A-110500 F0351

Application Docket No. _____

Submitted by: PPL Electric Utilities Corp.

DOCKETED
FEB 09 2005

SUMMARY

This filing is submitted by PPL Electric Utilities Corp. (PPL, or the Company) pursuant to the Pennsylvania Public Utility Commission's (PUC, or the Commission) regulations at 52 Pennsylvania Code, Chapter 57, Subchapter G, for approval to modify the existing Manor-South Akron 230 kV Line. The portion of this project subject to the PUC's approval involves splitting the existing Manor-South Akron 230 kV Line and connecting it to the proposed Millwood 230-69 kV Substation by means of two 230 kV tap lines 1,500 feet in length. In addition, two 69 kV connecting lines will connect the 69 kV side of the proposed substation to the existing Face Rock-Engleside #1 and #2 69 kV Line. The project is located in Pequea Township, Lancaster County.

The proposed 230 kV line modification will provide the electrical supply to the new Millwood 230-69 kV Substation. The substation and associated 69 kV transmission facilities are needed to provide an additional source of supply to the 69-12 kV substations that serve customers in the area, and thereby, alleviate potential overload conditions on existing 69 kV facilities.

The estimated cost to acquire the necessary right-of-way and to site, design, construct the proposed 230 kV tap lines is $710,200. This project has a required in-service date of May 2007. (A project's required in-service date is defined as the date the proposed facility needs to be placed in service to prevent existing facilities from violating the Company's planning principles.) Without this project, The Company's planning principles would be violated by the summer of 2007, when, in the event of an outage of either one of the Manor-Engleside #1 or #2 69 kV Lines, the forecasted peak load would exceed the emergency rating of the line that remained in service.

This document, which describes the need for the project and discusses the engineering and siting analysis for the proposed Manor-South Akron Line Modification, consists of the following exhibits and appendices:

Exhibit "A"	-	Necessity Statement
Exhibit "B"	-	Engineering Description
Exhibit "C"	-	Environmental Assessment
Appendix A		PPL Design Criteria and Safety Practices
Appendix B		Magnetic Field Management at PPL
Appendix C		Property Owners within the Proposed Right-of-Way
Appendix D		List of Governmental Agencies, Municipalities and Other Public Entities

LOCATION MAP

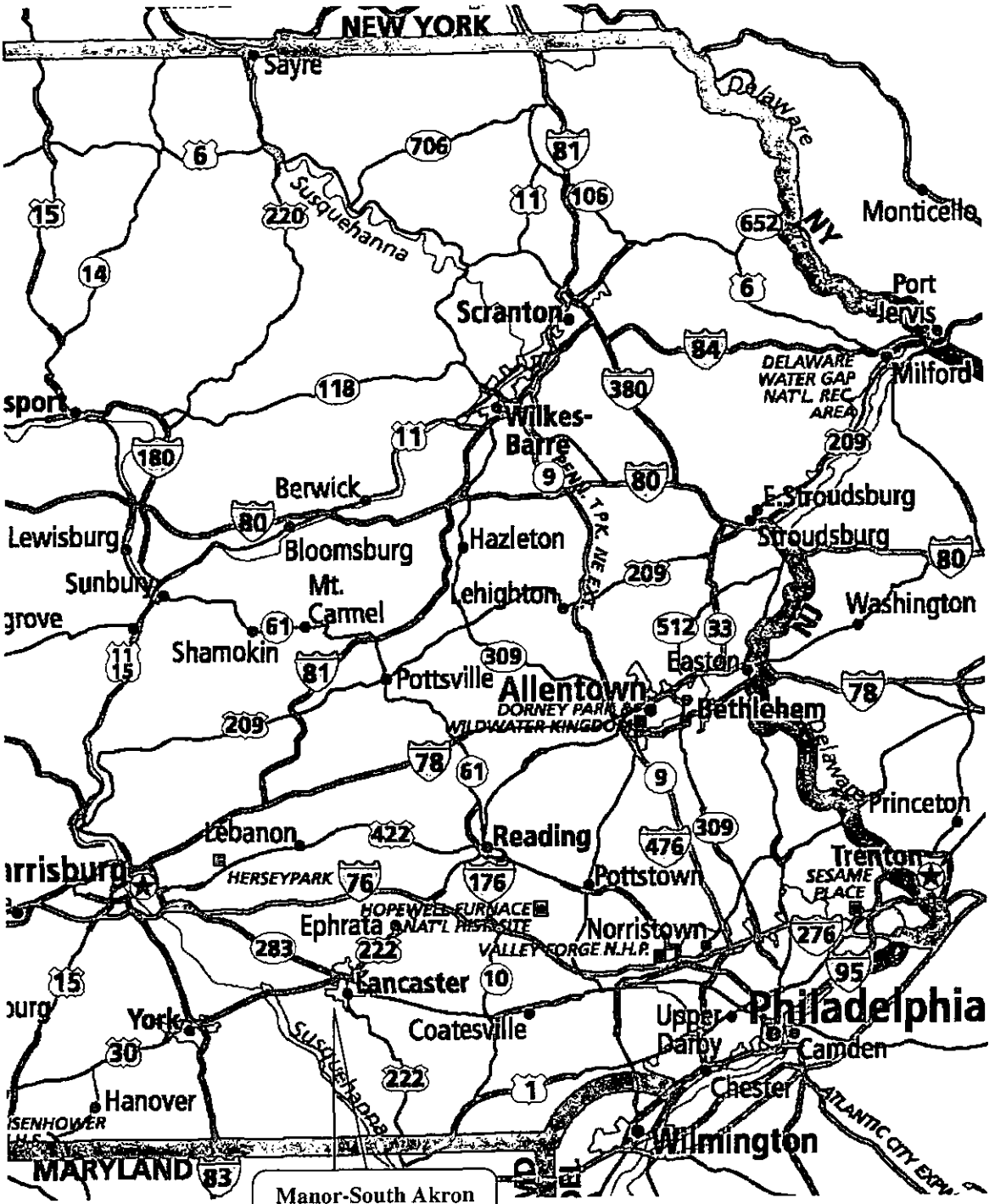


EXHIBIT A

EXHIBIT "A"
MANOR-SOUTH AKRON 230 kV LINE MODIFICATION
NECESSITY STATEMENT

TABLE OF CONTENTS

LIST OF FIGURES

MAP

EXHIBIT "A"

MANOR-SOUTH AKRON 230 kV LINE MODIFICATION
NECESSITY STATEMENT

A. INTRODUCTION

PPL proposes to split the existing Manor-South Akron 230 kV Line and loop the line into and out of the proposed Millwood 230-69 kV Substation that PPL will construct on a site in Pequea Township, Lancaster County. This modification will connect the Millwood 230-69 kV Substation to PPL's 230 kV System. The 230 kV transmission lines on either side of the new substation will be called, respectively, the Manor-Millwood 230 kV Transmission Line and the South Akron-Millwood 230 kV Transmission Line. Construction of these facilities is required to maintain reliable electrical service to southern Lancaster County.

Failure to complete this project would result in a violation of PPL's Reliability Principles & Practice Guidelines and could potentially lead to conductor failures on the Manor-Engleside #1 or #2 69kv Transmission Lines. Failure of these transmission lines would interrupt several thousand customers for more than 10 hours.

The estimated cost to design and construct the 230 kV line modification including right-of-way acquisition is $710,200. This project has a scheduled construction start date of October 2005 to meet an in-service date of May 2007. A PPL system map showing existing transmission facilities with a design voltage of 35 kV or greater is included in the Exhibit A map pocket. This filing addresses only the existing and proposed 230 kV transmission system in southern Lancaster County.

B. EXISTING SYSTEM

Presently, southern Lancaster County receives the bulk of its electric power from two sources: (1) Manor 230-69 kV Substation; and (2) the Holtwood Hydroelectric

Generating Station, via the Face Rock 69 kV Switchyard. The 69 kV transmission lines that exit the Manor 230-69 kV Substation and the Face Rock 69 kV Switchyard transport electric power at 69 kV to various 69-12 kV substations that further reduce the voltage to lower levels for distribution to homes and businesses.

C. DEFINITION OF THE PROBLEM

The area of concern is the capacity and reliability of the Manor-Engleside #1 and #2 69 kV Line, which is the source of electric supply to 69-12 kV substations at West Lancaster, Millersville, Millersville University, Engleside, Strasburg, and Greenland. The forecasted estimated 2007 combined summer peak load on the Manor-Engleside #1 and #2-69 kV Line is 124 MVA (62 MVA per circuit) when the hydroelectric generators at Holtwood are generating power. The combined 2007 summer peak load on these lines would reach155 MVA if the hydroelectric generators at Holtwood are not generating power. If either the #1 or the #2 line were to fail (a single-contingency outage condition) during a period of high power consumption, the transmission line that remained in service would try to carry a combined load of 124 MVA or more, which exceeds the emergency load carrying capability of the line.

D. PROPOSED SYSTEM

Figure 1 shows the proposed system that provides a new 230-69kV Millwood Substation supplied by the Manor-South Akron 230kV Line. In addition, the Face Rock – Engleside #1 and #269kV Line will be connected to the 69 kV side of the new Millwood Substation via 69 kV connecting lines.

The new Millwood 230-69 kV Substation and the new Millwood-Engleside #1 and #2 69 kV Lines change power flows to the Engleside 69 kV Switchyard due to a change in the transmission configuration. This will result an increase in power flow from the Millwood Substation to Engleside and a reduction in power flow from Manor to Engleside, thus reducing the loading on the Manor-Engleside 69 kV lines.

The proposed system will provide the required power supply reinforcement in the Engleside area. With this additional source of supply to the 69 kV transmission system, the loss of one of the Manor-Engleside Lines will not cause an overloading of the line that remains in service.

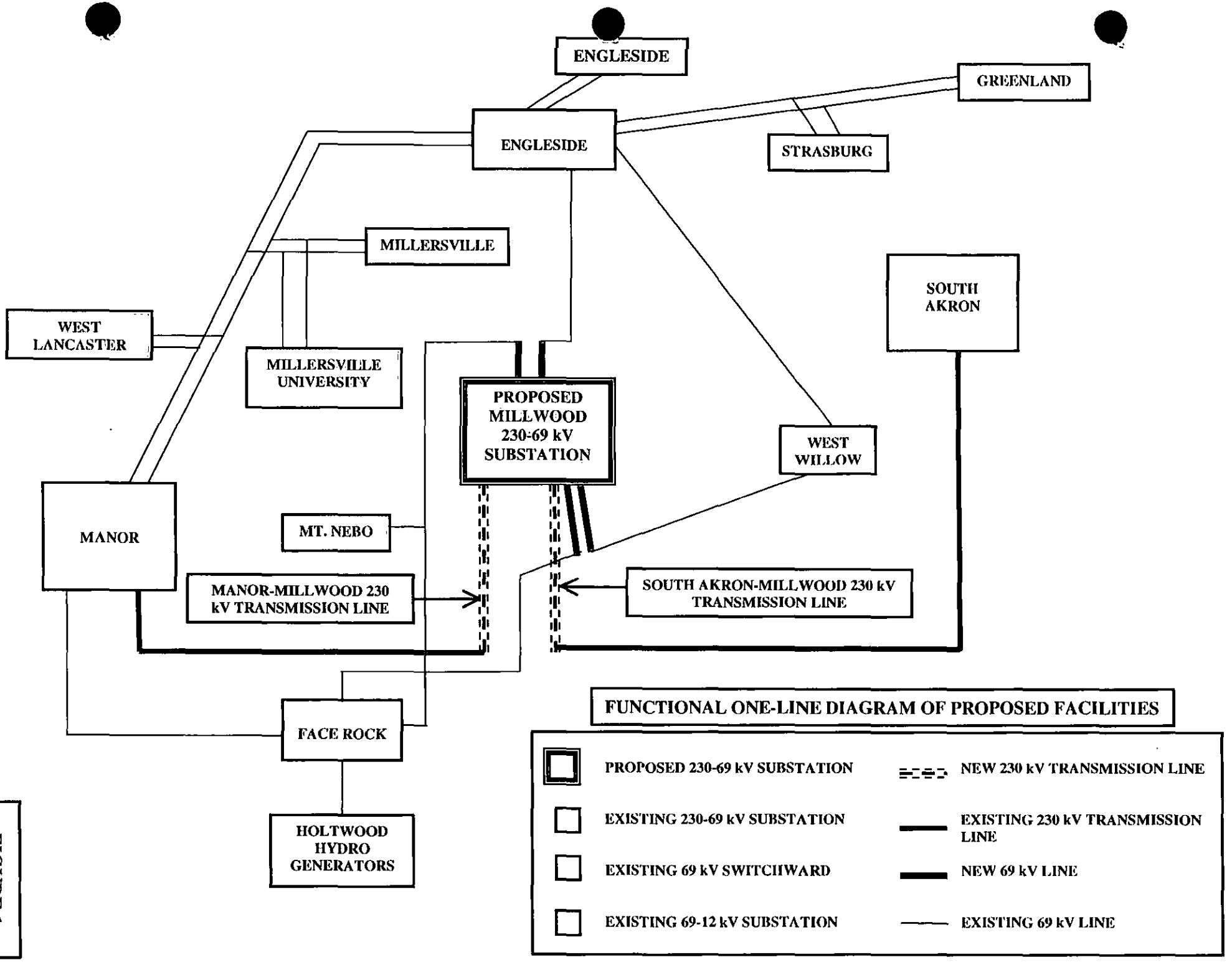
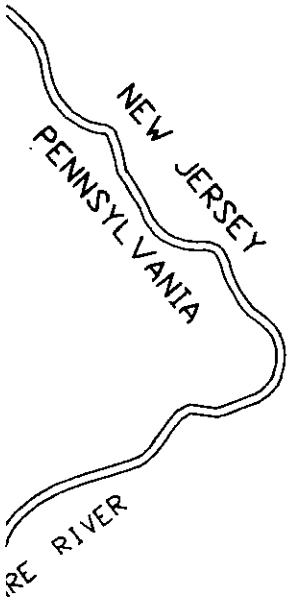

ENGLESIDE
GREENLAND
ENGLESIDE
STRASBURG
MILLERSVILLE
SOUTH AKRON
WEST LANCASTER
MILLERSVILLE UNIVERSITY
PROPOSED MILLWOOD 230-69 kV SUBSTATION
WEST WILLOW
MANOR
MT. NEBO
MANOR-MILLWOOD 230 kV TRANSMISSION LINE
SOUTH AKRON-MILLWOOD 230 kV TRANSMISSION LINE
FACE ROCK
HOLTWOOD HYDRO GENERATORS
FUNCTIONAL ONE-LINE DIAGRAM OF PROPOSED FACILITIES
PROPOSED 230-69 kV SUBSTATION
NEW 230 kV TRANSMISSION LINE
EXISTING 230-69 kV SUBSTATION
EXISTING 230 kV TRANSMISSION LINE
EXISTING 69 kV SWITCHWARD
NEW 69 kV LINE
EXISTING 69-12 kV SUBSTATION
EXISTING 69 kV LINE

FIGURE 1



OVERSIZED DOCUMENT(S)

PPL ELECTRIC UTILITIES

ACCT- 805201	ELECTRICAL SYSTEM MAP	
SCALE- NONE	MANOR–SOUTH AKRON 230KV LINE LINE MODIFICATION	
BY-		
REVIEWED	APPROVED ORIGINALLY BY G. HAKUN III — DATE 7/17/85	
PP&L DRAWING NO. D191830	SHEET NO. 1	REV. 28

PC FORMAT

EXHIBIT B

EXHIBIT "B"

MANOR-SOUTH AKRON 230 kV *LINE MODIFICATION*
ENGINEERING DESCRIPTION

TABLE OF CONTENTS

EXHIBIT "B"

MANOR-SOUTH AKRON 230 kV LINE MODIFICATION
ENGINEERING DESCRIPTION

A. DESCRIPTION OF PROPOSED LINE MODIFICATION

PPL proposes to modify the Manor-South Akron 230 kV Transmission Line by sectionalizing the line and connecting it to the proposed Millwood 230-69 kV Substation via two new 1,500-foot tap lines. The resulting sectionalized lines will be known as the Manor-Millwood 230 kV Transmission Line and the South Akron-Millwood 230 kV Transmission Line. The modified 230 kV line sections are located in Pequea Township, Lancaster County. A plot plan for the transmission line project is provided in the Exhibit "B" map pocket.

Each of the two new 1,500-foot tap lines will be supported by three single shaft steel poles (i.e., a total of six poles for both tap lines). The average height of these poles will be approximately 125 feet. Three power conductors and one overhead ground wire will be installed for each circuit. The power conductors will be 1590 KCMIL 45/7 strand ACSR, and the overhead ground wire will be ½" extra high strength steel.

The new 230 kV tap lines will be designed according to, and will generally surpass, National Electrical Safety Code standards. Additional design criteria and safety rules practiced by PPL are included in Appendix A. The minimum conductor-to-ground clearance will be 32 feet. This minimum clearance occurs at a maximum thermal conductor temperature of 125°C. The design minimum conductor ground clearances and conductor thermal ratings are as follow:

DESIGN MINIMUM CONDUCTOR CLEARANCES
FOR 1590 KCMIL 45/7 STRAND ACSR*

Condition	Single-Circuit Design Clearance-to-Ground
Normal load, average weather (16°C ambient temperature)	34.3 feet
Predicted extreme thermal load (125°C conductor temperature)	32 feet
Predicted extreme weather conditions (1-inch ice, 8 lbs. wind, -18°C)	35 feet

*Clearances based on a maximum tension of 6,000 pounds at 1 inch ice, 8 lbs. wind, 0 °C and a ruling span of 350 feet.

CONDUCTOR THERMAL RATING
1590 KCMIL 45/7 ACSR
125°C MAXIMUM CONDUCTOR TEMPERATURE

Condition	Ambient Temperature °C	Wind Speed Knots	Ampacity Amps
Summer Normal	35	0	1640
Winter Normal	10	0	1861
Summer Emergency	35	1.5	1990
Winter Emergency	10	1.5	2220

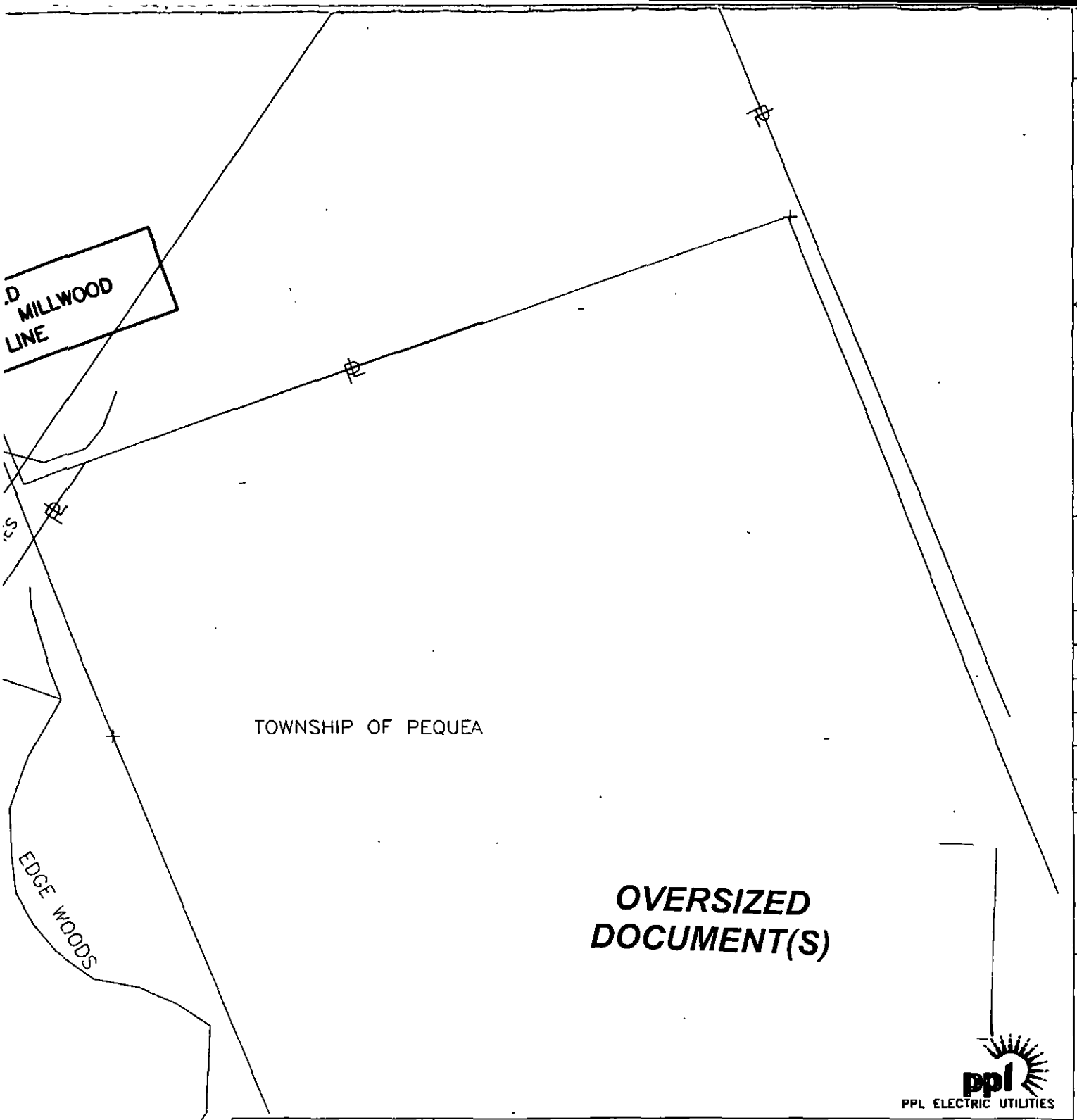
B. MAGNETIC FIELD MANAGEMENT

PPL's Magnetic Field Management Program, summarized in Appendix B, is applied to the construction of new transmission lines and the reconstruction of existing transmission lines. In order to lower magnetic field exposures, the program generally recommends the use of line design that provides 5 feet higher ground clearances (32 feet minimum) and reverse phasing for new double-circuit lines.

Reverse phasing will not be possible for the 230 kV tap lines that will supply the Millwood 230 kV Substation because they will be single circuit lines. However, pursuant to PPL's Magnetic Field Management Program, magnetic field levels will be reduced through the use of taller structures.

C. RIGHT-OF-WAY STATUS

Approximately 3.9 acres of right-of-way will be acquired from Pequea Township in order to make the taps of the Manor-South Akron 230 kV Transmission Line. Pequea Township has agreed to convey the necessary right-of-way to PPL. The Project Map in the Exhibit B map pocket shows the right-of-way required for the taps. In addition, the Project Map shows existing properties adjacent to the proposed Millwood 230-69 kV Substation. Appendix C lists the property owners within the proposed right-of-way of the 230 kV tap lines.



OVERSIZED DOCUMENT(S)

PPL ELECTRIC UTILITIES

ACCT–	PLOT PLAN EXHIBIT	
SCALE– NTS	MANOR – SOUTH AKRON #2 230kV LINE MODIFICATION	
BY–	PEQUEA TWP.	LANCASTER CO.
REVIEWED	APPROVED DATE	PPL ELECTRIC UTILITIES
PPL DRAWING NO. PLOT PLAN EXHIBIT	SHEET NO. 1	REV. 0

EWED APPROVED

SORTS

PC CAD

EXHIBIT C

EXHIBIT "C"

MANOR-SOUTH AKRON 230 kV LINE MODIFICATION
ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

EXHIBIT "C"

MANOR-SOUTH AKRON 230 kV LINE MODIFICATION ENVIRONMENTAL ASSESSMENT

A. INTRODUCTION

The project is located in Pequea Township, Lancaster County. Accordingly, the proposed line modification was reviewed with the Lancaster County Commissioners and the Pequea Township Supervisors. A list of the governmental agencies, municipalities, and other public entities that will be served with a copy of PPL's filing is included in Appendix D.

The site selected for the proposed Millwood 230-69 kV Substation was chosen because of its close proximity to nearby source and destination transmission lines. As a consequence, minimal additional right-of-way is required to make the necessary electrical connections to 230 kV and 69 kV facilities.

B. LAND USE

Land use patterns in the immediate vicinity of the project are a mix of agricultural, recreational and scattered residential. A small residential subdivision is located along Run Valley Road north of the project. Recreational facilities in the vicinity of the proposed transmission tap lines are located approximately 1,100 feet south of the Manor-South Akron 230 kV Line along Silver Mine Road.

PPL has acquired a 19-acre parcel of farmland as the site for the Millwood 230-69 kV Substation. The southeast corner of this parcel is located adjacent to the Manor-South Akron 230 kV Transmission Line. The selection of this site minimizes the amount of land encumbered by new transmission facilities. The closest visible residences are approximately 1,200 feet from the proposed transmission tap lines.

The proposed transmission tap lines will not cross any roads, nor will they affect any railroads, pipelines, communication towers, or other utilities. The Smoketown Airport is approximately 8.8 miles and Columbia Airport is approximately 10.3 miles away from the proposed tap lines. These airports are far enough away that they will not be affected by the proposed project.

Minimal land use and environmental impacts will result from construction of the proposed transmission tap lines. For most of their length, the proposed tap lines will be located on land that is currently used for agricultural purposes. Except for the "footprint" of the supporting structures, the land beneath the lines can remain in agricultural production. A short portion of the proposed tap lines crosses a small creek. There will be no impact to the creek because the proposed transmission lines will span the area.

C. CULTURAL RESOURCES

This project was reviewed with the Pennsylvania Historical and Museum Commission (PHMC). PHMC has determined that this project will have no effect on significant archaeological resources.

The following lists were reviewed for the presence of historical districts and structures in the area:

- National Historic Landmarks in Pennsylvania
- National Register Historic Districts in Pennsylvania
- National Register Individual Properties and Historic Districts in Pennsylvania
- National Register/Listed and Eligible Properties in Pennsylvania

There are several structures of historical interest nearby. The closest is Baumgardner's Mill Covered Bridge, which was constructed in 1860. It is listed in the National Register/Listed and Eligible Properties in Pennsylvania. The bridge is located approximately 1.7 miles from the project area on Township Road 427 and will not be affected due to its distance from the project area.

D. NATURAL FEATURES

The proposed tap lines will not affect any unique geological, scenic or natural areas. No National Natural Landmarks, parks or recreational facilities are located near the project area.

Tree clearing will be minimal, and PPL's "Program for Vegetation Management" will be applied to mitigate any impacts. The proposed tap lines will not cross any wetlands. However, the proposed tap lines will span over a small stream. PPL will employ its "Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way" as appropriate and will also secure all required environmental permits prior to the start of construction.

E. THREATENED AND ENDANGERED SPECIES

One animal species of special concern was identified as potentially inhabiting the project area. It is the Pizzini's cave amphipod (Stygobromus pizzinii). PPL will be applying for a National Pollutant Discharge Elimination System Permit due to the size of the project. The terms and conditions of the permit, as well as its application, will ensure that there will be no impact to this small, endangered crustacean.

PPL retained the services of Mr. Richard Mellon, Ecologist and Certified Wetland Scientist, of Mellon Biological Services to assess nearby wetlands for bog turtle habitat. Based on Mr. Mellon's research and field review, he concluded that:

- No potential Bog Turtle habitat was found on-site
- No Potential Bog Turtle habitat was found near enough to the site to be even indirectly impacted by the project.

APPENDICES

LIST OF APPENDICES

APPENDIX A

PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corp. (PPL) has developed design specifications and safety rules which meet or surpass all provisions specified by the NESC.

Engineering Design Criteria and Parameters

The NESC includes loading requirements and clearances for the design, construction, and operation of power lines. The "loads" on conductors and supporting structures are the mechanical forces that develop from the weight of the conductors, the weight of ice on the conductors, plus wind pressure on the conductors and supporting structures. Loading requirements are the loads on the conductors and structures that are anticipated assuming certain ice and wind conditions. Loading requirements always contain "safety factors" to allow for unknown or unanticipated contingencies. The clearances and loading requirements contained in the NESC were developed to ensure public safety and welfare.

PPL transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies such things as larger-minimum crossarm dimensions, larger-minimum conductor size, and increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the overhead ground wire (OHGW) and power conductors. The NESC standard ice and wind design magnitudes for the PPL territory are 0.5 inch thickness of radial ice combined with four pounds per square foot horizontal wind pressure (equivalent to 40-mile per hour wind velocity). The conductor sags and tensions used in line designs are the result of various ice and wind combinations, depending on the elevation at the line location and line design voltage. The conductor sags and tensions used in the design of all PPL transmission lines are at least 0.5-inch ice combined with eight pounds wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

	Vertical Clearance to Ground	
Surface Underneath Conductors	NESC Standard	PPL Design
Roads, streets, alleys	21 Ft.	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	21 Ft.	30 Ft.
Spaces accessible to pedestrians only	17 Ft.	30 Ft.
Railroad tracks	31 Ft.	35 Ft.

230 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	23 Ft.	32 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	23 Ft.	32 Ft.
Spaces accessible to pedestrians only	19 Ft.	32 Ft.
Railroad tracks	31 Ft.	36 Ft.

500 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	28 Ft.	53 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	28 Ft.	53 Ft.
Spaces accessible to pedestrians only	24 Ft.	53 Ft.
Railroad tracks	38 Ft.	53 Ft.

A relay protection system is used to protect the public safety and welfare as well as equipment and the transmission system. Relay protection is installed for all transmission lines to automatically de-energize the line in the unlikely event that the line or supporting structure fails and the line contacts the ground.

Periodic Maintenance Program on All Transmission Lines

To ensure continued public safety and integrity of service, a periodic maintenance and inspection program is implemented for every transmission line. The program is administered through the use of helicopter patrols, with supplemental foot and structure

climbing patrols. A number of helicopter patrols are performed on all lines annually. The two-man helicopter crew flies parallel, to the left, and above the line so that the observer can look for signs of line damage or deterioration and observe clearances between vegetation and conductors. The observations are included in a report that is forwarded to the appropriate department for corrective action.

Foot and structure climbing patrol programs for a transmission line begin approximately three to five years after the line is energized, unless a helicopter patrol reports a need for earlier action. The frequency of foot patrols varies from once every year to once every several years depending on line type and age.

An assigned foot patroller checks right-of-way conditions, including access roads, bridges, pole washouts, tower footers, vegetation height and clearance to conductors, pole and tower deterioration and, with the use of binoculars, insulators, and condition of hardware. Identified problems are included in a report that is forwarded to the appropriate department for corrective action.

A scheduled line outage is required to perform an overhead patrol because of "hands-on" inspection of hardware. Overhead patrols are conducted on a schedule determined by line age, operating record, and observed general condition. The necessary repairs are also done during the inspection outage.

Personnel Safety Rules

The following are a few of the PPL safety rules that demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energized facilities in a safe manner. When lines or apparatus are removed from service to be worked on, the Energy Control Process system is applied. This system provides that a red tag must be physically placed on the control handle of the de-energized equipment. The red tag may be removed only after proper authorization to energize the equipment. Various other tags are used for limited operations and informational purposes.

Employees will not apply or remove a tag or change the status of tagged equipment unless authorized.

- Temporary safety grounds are used on de-energized facilities for employee safety during maintenance, construction, or reconstruction work. Safety grounds are wires connecting the de-energized facility to an electrical ground. If the facility should be energized, the safety grounds will divert the current directly to ground and reduce the likelihood of personal injury. The conductor size and attachment clamps of temporary safety grounds must be capable of conducting anticipated fault currents. Rubber gloves, rubber sleeves, and additional rubber protective equipment are used as required when applying or removing temporary safety grounds to or from the lines or apparatus to be grounded. An approved nonconductive working stick of sufficient length to allow workers to maintain the following required minimum clearances is used to test that the line has been de-energized and to apply temporary safety grounds:

Voltage-kV	Minimum Clearance
138	3'-7"
230	5'-3"
500	11'-3"

Before applying grounds, a test is done to confirm that the line is de-energized. The voltage test device is checked before and after use to assure reliability. When ground pins are used to establish proper ground points, they are driven to a depth of not less than four feet as near vertical as possible.

- Poles or structures are inspected and examined for structural integrity before climbing. If there is any reason to believe that a pole is unsafe, it is stabilized before work is performed. Appropriate safety gear in the form of body belts, safety straps, hard hats, gloves, etc., is worn by linemen during line work activity.

APPENDIX B

MAGNETIC FIELD MANAGEMENT

PPL Electric Utilities Corporation

DECEMBER 2004

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INTRODUCTION

At PPL Electric Utilities Corp. (PPL EU), magnetic field management means investigating and implementing methods at low or no cost to reduce magnetic fields in new or rebuilt transmission and distribution lines. This document explains PPL EU's Magnetic Field Management Program, which is part of PPL EU's larger Electric and Magnetic Fields (EMF) policy.

PPL EU's View

Some people are worried that electric and magnetic fields are harming their health. Others think the scientific research does not show a problem at all, and still others believe there's just too much scientific uncertainty to draw any conclusions.

Here's what we do know now. Various panels of scientists that have reviewed the EMF research generally have drawn two main conclusions. First, the large body of evidence does not demonstrate that EMF are harmful. Second, additional research is recommended to explore questions raised in some studies.

Given these conclusions, PPL EU is taking a reasoned approach in responding to the EMF issue. PPL EU's approach to the EMF issue consists of five elements:

- Providing EMF information to customers and employees
- Providing magnetic field measurements
- Establishing and implementing a magnetic field management program to reduce magnetic fields in new or rebuilt facilities when it can be done at no, or low, cost
- Integrating EMF in the public involvement process that PPL EU undertakes in the siting of transmission lines
- Have supported additional research

EMF Are All Around Us

Electric and magnetic fields occur in nature and in all living things. The earth, for instance, has a magnetic field, which makes the needle on a compass point north.

Electric fields and magnetic fields of a different type also surround every wire that carries electricity. In everyday life, these EMF arise from several basic sources, including power lines, electrical appliances, home and building wiring, other utility lines and cables, and currents flowing on water pipes. Though they often occur together, EMF are made up of two separate components:

Electric Fields

Electric fields are produced by the voltage—or electrical pressure—on a wire. The higher the voltage, the higher the electric field. As long as a wire is energized—has voltage present—an electric field is present (see Figure 1). In other words, an appliance, or an electric power line, doesn't actually have to be turned on to create an electric field. It just has to be plugged in. Electric fields diminish with distance and can be blocked or partially shielded by objects such as trees and houses.

Magnetic Fields

Magnetic fields are created by the current or flow of electricity through a wire. Generally speaking, the higher the current, the higher the magnetic field. Because they only occur when current is flowing, magnetic fields are present only when the power is turned on (see Figure 1). Magnetic fields also diminish with distance, but—unlike electric fields—are not blocked by common objects. In recent years, public and scientific interest has turned toward the magnetic field component of EMF because of some scientific studies regarding these fields.

Figure 1

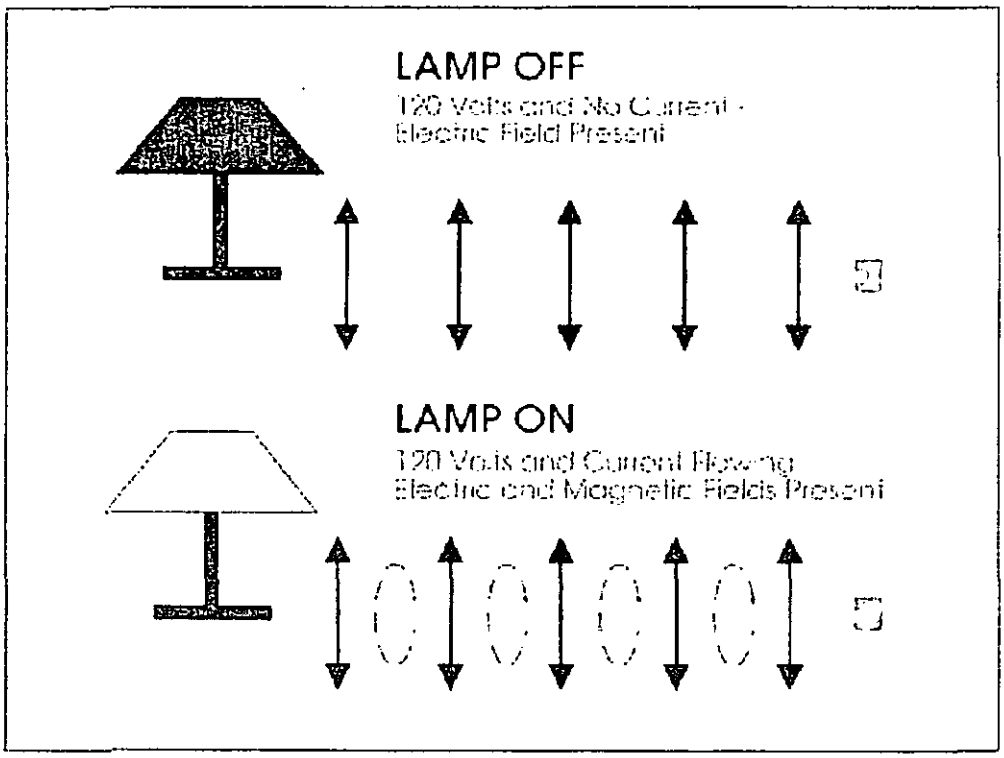

LAMP OFF
120 Volts and No Current -
Electric Field Present
LAMP ON
120 Volts and Current Flowing
Electric and Magnetic Fields Present

Figure 2

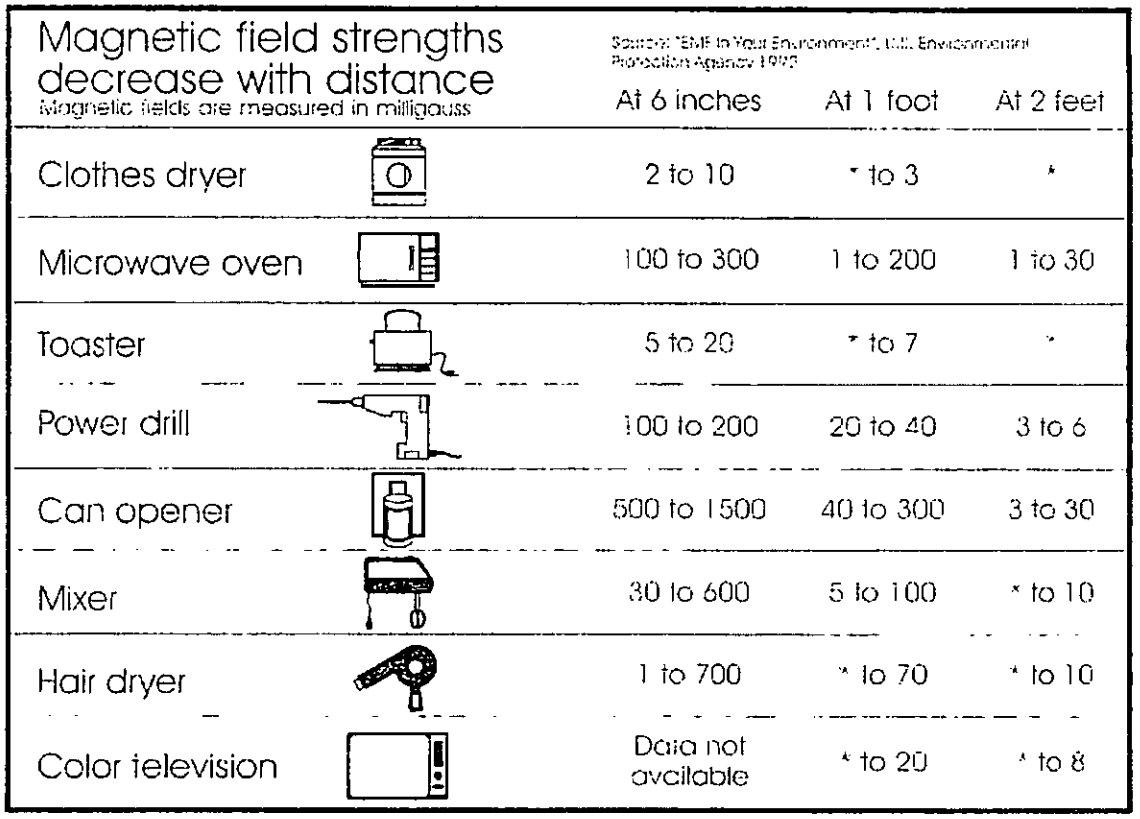


FIGURE 2 * The magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

Measuring Magnetic Fields

Magnetic fields usually are measured in a unit called a milligauss. Magnetic field levels found in the living areas of homes typically range from less than 1 milligauss to about 4 milligauss according to the U.S. Environmental Protection Agency. They can be higher in some cases. The levels next to appliances can exceed 1,000 milligauss (1 gauss). Figures 2 and 3 show how the strength of the field falls off as you move away from the source, just as the heat of a campfire grows weaker as you walk away from it. For overhead power lines, the strength of the magnetic fields is dependent upon a number of factors that will be explained later. Those factors produce a magnetic field that drops off rapidly as you move away from the power line.

Figure 3

Sample Magnetic Field Levels in Milligauss				
Type of Overhead Power Line	**Distance from the line**			
	Under the line	**50 ft.**	**100 ft.**	**200 ft.**
220 kV and 500 kV	5-400	5-250	1-75	0.5-20
69 kV and 138 kV	3-80	0.5-2.5	0.1-10	0.1-3
12 kV and below	0.4-20	0.1-1	-	-

The magnetic field values provided in this table represent a general range of values associated with the types of overhead power lines listed and are provided for illustration. There will be circumstances in which there will be magnetic field levels above or below the range of values provided due to variations in such factors as height of the wires, current flow and so on.

DEVELOPMENT OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

One element of our response to EMF concerns expressed by some of our customers is PPL EU's Magnetic Field Management Program. The program was initiated in March 1991 because PPL EU believes it makes good sense, as a matter of policy, to respond to the concerns expressed by some of our customers and to reduce magnetic fields in new and rebuilt facilities where it can be done with either no-cost or low-cost design changes.

This document updates the original program which has been revised several times since 1991. These guidelines were developed by PPL EU's EMF Working Group.

VARIABLES THAT AFFECT MAGNETIC FIELDS

Magnetic fields from transmission and distribution lines are a function of a number of design variables. The following parameters affect the magnetic field levels produced by transmission and distribution lines:

- Current
- Height of conductors above ground
- Configuration of conductors
- Distance from the line

EFFECT OF PHASE CURRENT ON MAGNETIC FIELDS

At power frequencies (i.e., 60 hertz), the magnetic field level is a function of the current or flow of electricity through a wire. Keeping all other parameters the same, the magnetic field is proportional to the current. Hence, if the current increases by 25 percent, the resulting magnetic field level will increase by 25 percent.

The overall load current on any line varies with the demand for power. It's usually highest during daytime hours and lowest at night. There also are weekly, monthly, seasonal and yearly variations.

The difference in the currents between each phase in a multiphase line also can affect the magnetic field. This difference is called phase unbalance. For a constant load, a statistical analysis of this phase unbalance can be made to determine its effect on the magnetic field. Close to the line, there is very little effect. However, the phase unbalance slows the rate at which the magnetic field decreases with distance from the line.

Effect of Conductor Configuration on Magnetic Fields

In the transmission and distribution of power, utilities like PPL EU presently use both three-phase and single-phase lines. Each phase on a three-phase power line has either a single conductor or a bundle of two or more conductors. In a three-phase system, the ground-level magnetic field is a result of the fields produced by the currents in each of the phases. Placing the three phases as close together as possible (compaction) creates some field cancellation, and the ground-level magnetic field is reduced. However, appropriate phase separation is required for the reliable operation of the line. In addition, the arrangement of the phases can create some; field cancellation and reduction of the ground-level magnetic field.

Effect of Distance From the Magnetic Field Source

Magnetic field strength diminishes with the vertical and lateral distances from the magnetic field source. Increasing the height of the conductors above ground is useful for magnetic field reduction at ground level, but may result in increased structure costs and increased aesthetic impact of the structures. Another possible method of increasing the distance to the magnetic field source is to increase the right-of-way requirements. By keeping buildings off increased rights of way, thereby requiring the public to live and work further away from lines, exposure to magnetic fields produced by the lines can be reduced. Increases in right of way are not always practical and may increase costs significantly, however.

SUMMARY OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

Under its Magnetic Field Management Program, PPL EU has changed the way it builds and rebuilds some of its transmission and distribution lines. These design changes reduce magnetic field levels (assuming balanced circuit loadings and phase currents) by up to 69 percent in most of the company's new transmission lines. These guidelines now are being applied to new and reconstructed transmission facilities, based on this program.

The distribution component of the program focuses on 12 kV lines, the company's standard distribution voltage. It concentrates on the three-phase, primary 12 kV lines, since these are the most heavily loaded facilities and often are located in densely populated areas. The guidelines in this program are being applied to these three-phase, primary 12 kV lines.

A maximum 3-5 percent change in estimated cost was used as the limit for the guidelines since this value is consistent with low cost, is within estimating accuracy and is likely to have little impact on overall line costs.

The magnetic field calculations used in this document for the design of PPL EU's overall magnetic field management plan assume balanced load conditions among the phases and a fixed level of current, not necessarily representative of specific transmission or distribution lines. These levels were calculated using the Electric Power Research Institute's ENVIRO computer program. Under actual operating conditions, the magnetic field levels that result may vary due to such things as actual load per circuit, overall current on each phase conductor and the electrical configuration and operation of each line.

MAGNETIC FIELD MANAGEMENT PROGRAM GUIDELINES

The guidelines for magnetic field management are noted below, with discussion points for each.

OVERHEAD LINES

NEW OR REBUILT TRANSMISSION LINES

1. **Balance transmission circuit loads and phase currents as much as possible.**
    - PPL EU should continue to make every effort to balance loadings between the two circuits of a double circuit line when planning new or rebuilt facilities to maximize the effects of reverse phasing.
    - PPL EU should continue the practice of balancing single-phase loads across the three phases of the distribution system. (Unbalanced phase currents on the distribution system are reflected through to the transmission system.)
        - Unbalanced phase currents result in higher magnetic fields that do not drop off as quickly with distance as do the fields resulting from balanced phase currents.
        - For a 5 percent phase current unbalance, the magnetic field 50 feet from the centerline of a single circuit 138 kV line could be more than twice the value than if the same line had balanced phase circuits.
    - Balanced phase currents on each three-phase distribution circuit also reduce magnetic fields from the distribution circuits themselves. In addition, they reduce magnetic fields on the transmission system from which the distribution system circuits are supplied and connected through substations.
    - Apart from magnetic field considerations, balanced phase currents on each three-phase distribution circuit also reduce line losses and improve the system voltage.

2. **Continue with the present practice of using long-span construction as the PPL EU 138/69 kV standard**

- Structure designs for short-span and long-span construction are illustrated on Charts I and II, respectively.
  - Short-span design does not significantly reduce magnetic fields when compared to long-span design even though it is more compact than long-span design. Comparison of the magnetic field values from Chart III indicates essentially the same values. Therefore, short-span design should not be used solely to reduce magnetic fields.
  - PPL EU will continue to use long-span construction for 138/69 kV double-circuit lines and for single-circuit/future-double-circuit lines.
  - For single-circuit/future-double-circuit lines, PPL EU will continue to install two conductors on the top positions and one in the middle position as shown in Chart IV.
    - This arrangement minimizes magnetic fields as shown in Chart V by placing the three initial conductors higher on the structure, which increases the ground clearances, and by placing the conductors in a triangular configuration.

3. **Compact design structures are not a low-cost alternative and should be used for magnetic field reduction only in special applications.**

Chart VI illustrates the compact design structure.

- The compact design increases the initial installation costs by 79 percent when compared to the long-span design but reduces the magnetic field from 9 mG to 3 mG (about 67 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.

4. **Reverse phase new or rebuilt double-circuit transmission lines for all voltage levels.**

- Reverse phasing was adopted by PPL EU in March 1991 for double-circuit 138/69 kV transmission lines and in April 1992 for all other double circuit transmission lines. Reverse phasing is shown in Chart VII. Reverse phasing will reduce the magnetic fields when the current flow on both circuits is in the same

direction. Calculated values contained here are based on balanced and equal phase currents on both circuits.

- Reverse phasing reduces the magnetic field of a double circuit 138 kV single pole transmission line from 29 mG to 9 mG (about 69 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.
- Reverse phasing reduces the magnetic field of a double circuit 230 kV single pole transmission line from 49 mG to 16 mG (about 67 percent) at the edge of the 150-foot-wide right of way as shown on Chart VIII.
- Reverse phasing reduces the magnetic field of a double-circuit 500 kV single pole transmission line from 37 mG to 21 mG (about 43 percent) at the edge of the 200-foot-wide right of way as shown on Chart IX.

• When new or rebuilt double-circuit lines require tapping existing double-circuit lines, PPL EU will review the existing lines to determine if reverse phasing can be provided at low cost.

• Computer modeling is required to develop the optimum phasing and overall conductor arrangements for lines added to, or rebuilt in, multiple-line corridors.

- Merely adding a reverse-phase double-circuit line to an existing transmission line corridor or reverse phasing a rebuilt line in the multiple-line corridor will not necessarily produce lower magnetic field levels at the edge of the corridor right of way.
- The corridor must be computer modeled with all the lines, existing phase conductor locations and currents. Then, magnetic field calculations must be made varying the phase arrangements of the new or reconstructed line to determine the appropriate phasing arrangement.
- Current flow direction on a line also must be considered. For example, a reverse-phased line should have the current flowing in the same direction on both circuits. If the current flow is in the opposite direction for one circuit, reverse phasing will not produce the lowest magnetic field and another phase arrangement that produces lower fields may need to be utilized.

5. **Increase the minimum ground clearance for all new transmission lines.**

138/69 kV Transmission Lines

- Increasing the minimum line design ground clearance from 25 feet to 30 feet may add up to about 5 percent to the installed cost of a new double-circuit single pole 138/69 kV line. For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. With long-span reverse-phase design, the, magnetic field is reduced from 9 mG to 7 mG (about 22 percent) at the edge of a 100-foot-wide right of way as shown in Chart X.
  - In the actual design of transmission lines to include higher minimum ground clearances, there may be limited segments (such as highway crossings, severe slopes and transmission line crossing locations) where National Electrical Safety Code (NESC) minimum ground clearances may need to be used. The NESC minimum ground clearances are less than the increased ground clearance discussed previously.

230 kV Transmission Lines

- Increasing the minimum line design ground clearances from 27 feet to 32 feet may add up to about 5 percent to the cost of a single-circuit single-pole line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 30 mG to 28 mG (about 7 percent) at the edge of a 150-foot-wide right of way.
- Increasing clearances from 27 feet to 32 feet could theoretically add up to about 2.8 percent to the cost of a double-circuit single-pole line (current standard) and reduce the magnetic field of a reverse-phase line from 16 mG to 15 mG (about 6 percent) at the edge of a 150-foot-wide right of way. Chart XI is a summary of this data.
- Studies are required for each new 230 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such

studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced phase spacing (a "Delta" configuration on a single-circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

500 kV Transmission Lines

- Increasing ground clearances from 33 feet to 53 feet may add up to about 4.5 percent to the cost of a single-circuit "H-frame" line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 42 mG to 35 mG (about 17 percent) at the edge of a 200-foot-wide right of way.
- Increasing ground clearances from 33 feet to 53 feet could theoretically add up to 2.8 percent to the cost of a double-circuit "H-frame" line (current standard) and reduces the magnetic field of a reverse-phase line from 21 mG to 16 mG (about 24 percent) at the edge of a 200-foot-wide right of way. Chart XII is a summary of this data.
- Studies are required for each new 500 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced-phase spacing (a "Delta" configuration on a single circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

RECONDUCTORING OR ADDING ADDITIONAL CIRCUITS TO EXISTING TRANSMISSION LINES

When reconductoring or adding additional circuits to existing transmission lines, PPL EU will evaluate low-cost or no-cost options for magnetic field management on a case-by-case basis.

When reconductoring existing transmission lines or adding additional circuits, low-cost alternatives may not exist; however, the following steps will be taken:

- For a single-circuit line, the use of a Delta arrangement or other modifications on the existing structure, with reduced-phase spacing, will be evaluated.
- For double-circuit lines, application of reverse phasing may reduce the magnetic field under the line and within the right of way and will be evaluated.
- For single- and double-circuit lines, evaluate using higher conductor tensions that can increase the minimum line design ground clearance.

DISTRIBUTION LINES

At the 12 kV distribution level, new main three-phase lines will continue to be constructed with five feet of additional ground clearance.

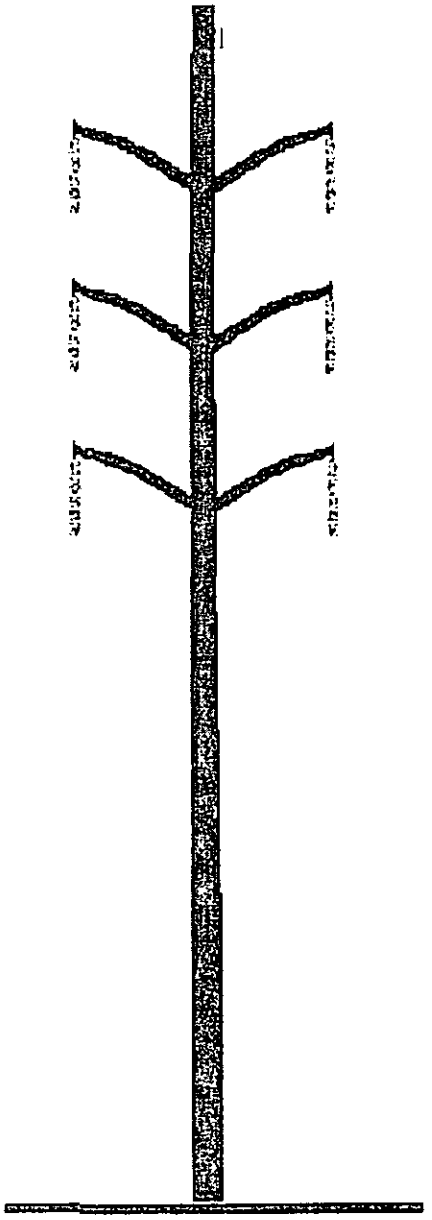
- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These values are based on increasing pole heights from 45 feet to 50 feet and a typical operating current of 300 amps per phase.
- Chart XIII is a summary of this data. Increasing ground clearance by five feet could theoretically add about 5 percent to the cost of a typical distribution line.

UNDERGROUND TRANSMISSION LINES

Underground transmission lines are required due to environmental or land use factors or restrictions on available clearances, PPL EU will evaluate options for magnetic field management techniques on a case-by-case basis.

- The phase arrangement that produces the lowest field will be determined.
- The depth of burial of the line will be determined considering the cost of excavation and the location of other buried utilities in the area.
- The use of steel pipe ferromagnetic shielding that reduces magnetic fields will be evaluated.

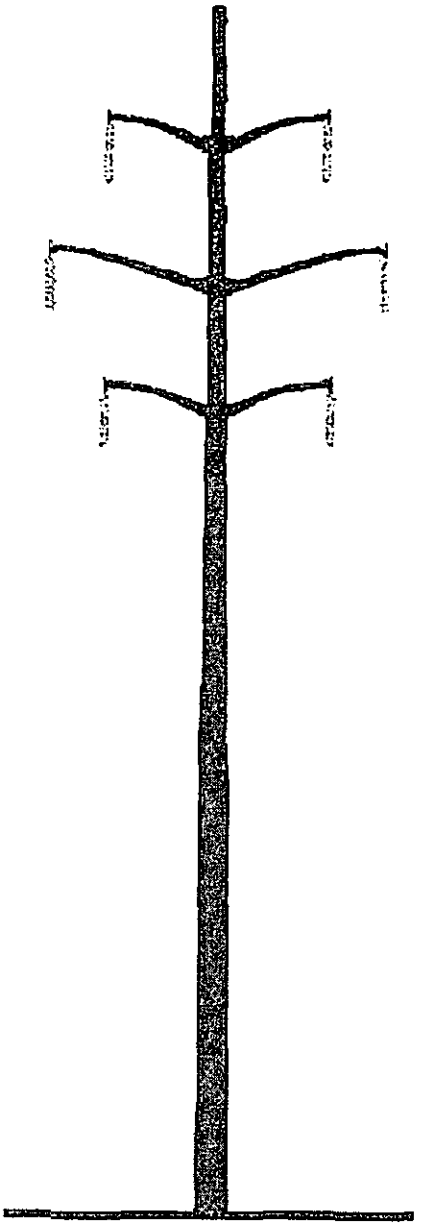
Short-Span Construction



- More compact design
- Should not be used solely to reduce magnetic fields
- Typical conductor data:

  1 3/8" HS steel overhead ground wire - 7.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 10.0 feet sag
  Average span - 400 feet

Long-Span Construction Remains PPL EU 138 kV Standard



- **Lower cost alternative**
- **Reduces magnetic fields due to higher structures**
- **Typical conductor data:**

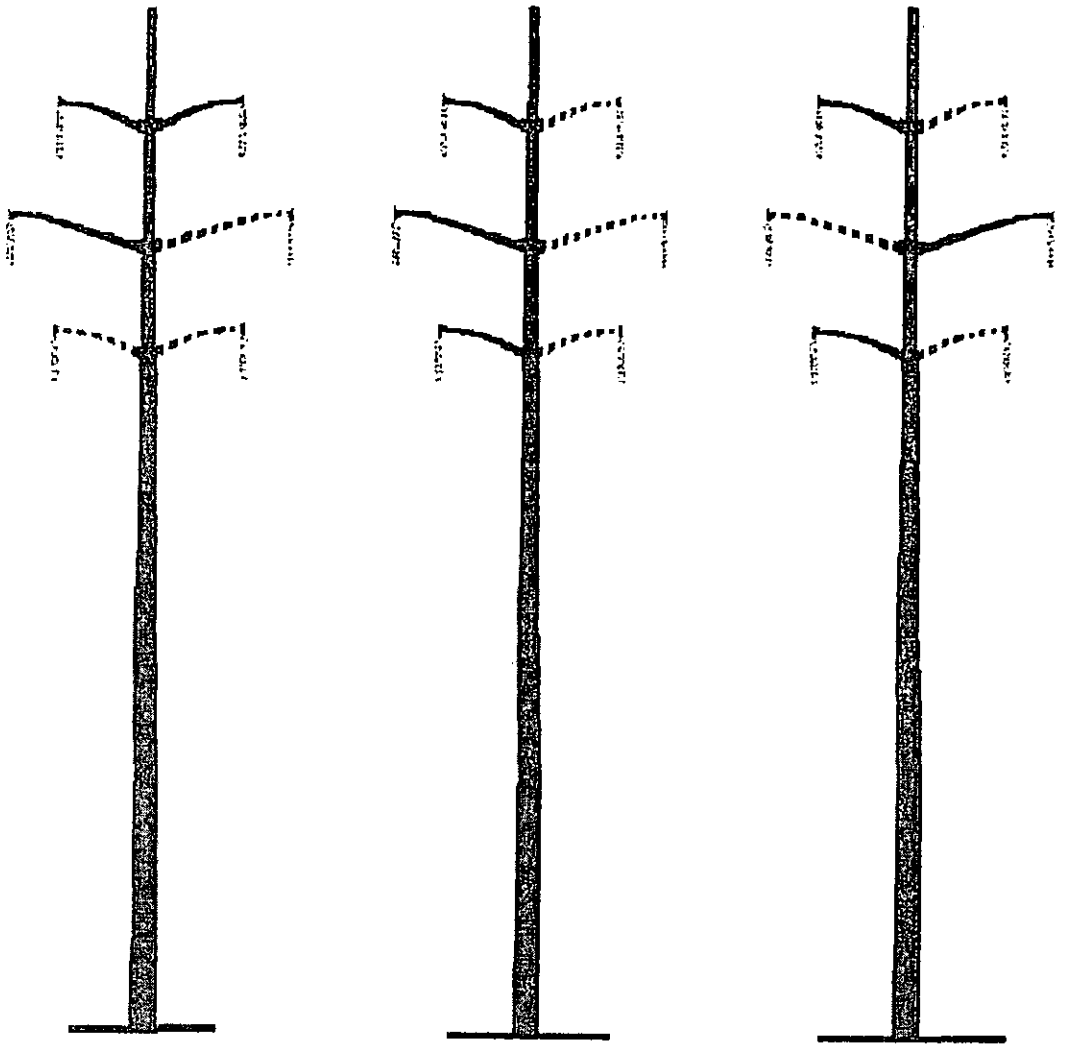
  1 3/8" HS steel overhead ground wire - 17.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
  Average span - 600 feet

138/69 kV REVERSE-PHASE TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SHORT SPAN (CHART I)	30
SHORT SPAN (REVERSE PHASE)	8
LONG SPAN (CHART II)	29
LONG SPAN (REVERSE PHASE)	9
COMPACT (CHART VI)	14
COMPACT (REVERSE PHASE)	3

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.
LONG SPAN, SHORT SPAN and COMPACT are double-circuit lines.

Typical Single-Circuit Structure Designs



Top/Middle

Vertical

Top/Middle/Bottom

initial single circuit

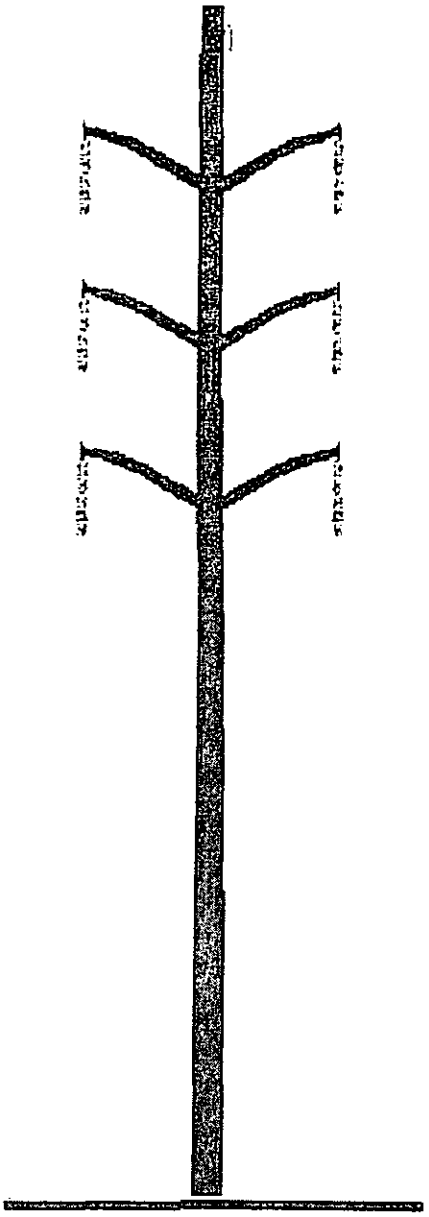
future second circuit

138/69 kV SINGLE CIRCUIT TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
TOP/MIDDLE/BOTTOM	20
VERTICAL	17
TOP/MIDDLE	12

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.

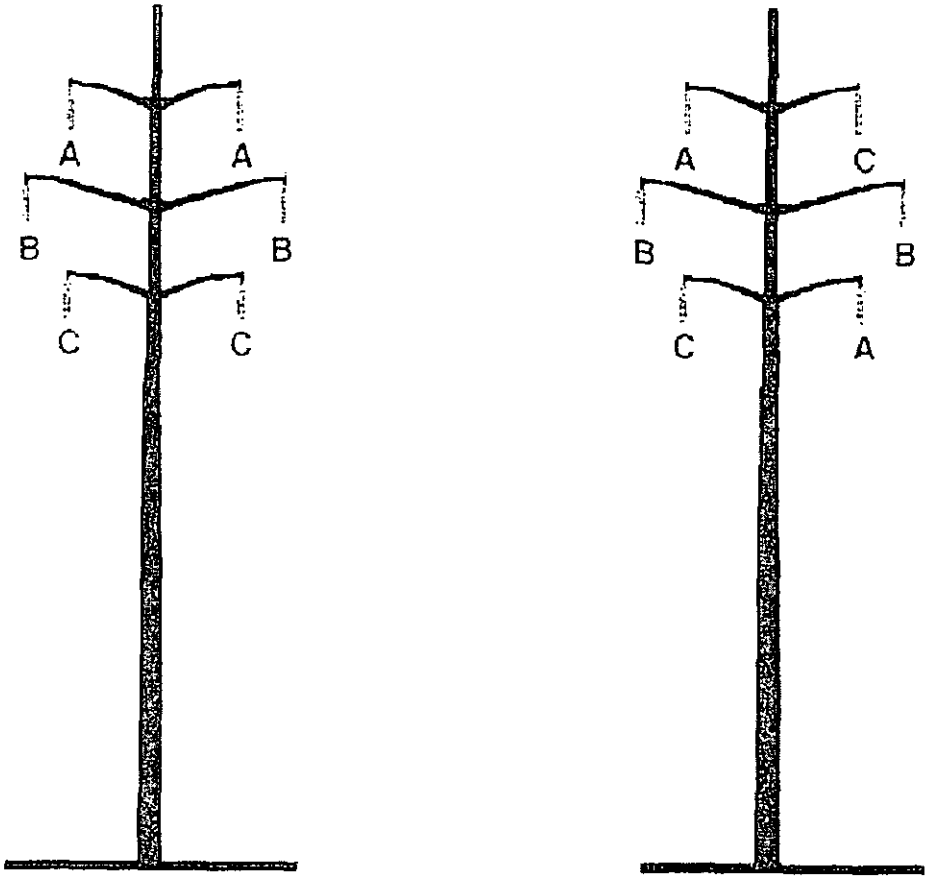
Compact Design Structure



- **Minimize magnetic fields due to compact design**
- **Not a low-cost alternative**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 9.0 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 9.0 feet sag
  Average span - 300 feet

Reverse Phasing of Double-Circuit Transmission Lines



From: → → → → To:

Reverse phasing also can be one of the following phase arrangements:

A	B		B	A		B	C		C	A		C	B
C	C	or	C	C	or	A	A	or	B	B	or	A	A
B	A		A	B		C	B		A	C		B	C

CHART VIII

230 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	49
DOUBLE CIRCUIT POLE (REVERSE-PHASE)	16

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 27 feet.

CHART IX

500 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 1100 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	37
DOUBLE CIRCUIT POLE (REVERSE PHASE)	21

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 33 feet.

CHART X

INCREASED 138/69 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	25	12
SINGLE CIRCUIT TOP/MIDDLE	30	10
LONG SPAN	25	29
LONG SPAN	30	26
LONG SPAN (REVERSE PHASE)	25	9
LONG SPAN (REVERSE PHASE)	30	7

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.

INCREASED 230 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	27	30
SINGLE CIRCUIT TOP/MIDDLE	32	28
DOUBLE CIRCUIT POLE	27	49
DOUBLE CIRCUIT POLE	32	46
DOUBLE CIRCUIT POLE (REVERSE PHASE)	27	16
DOUBLE CIRCUIT POLE (REVERSE PHASE)	32	15

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.

INCREASED 500 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 1,100 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT "H" STRUCTURE	33	42
SINGLE CIRCUIT "H" STRUCTURE	53	35
DOUBLE CIRCUIT POLE	33	37
DOUBLE CIRCUIT POLE	53	31
DOUBLE CIRCUIT POLE (REVERSE PHASE)	33	21
DOUBLE CIRCUIT POLE (REVERSE PHASE)	53	16

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.

12 kV DISTRIBUTION LINES
CALCULATED MAGNETIC FIELDS AT 300 AMPERES

TYPE CONSTRUCTION	POLE HEIGHT FEET	MAGNETIC FIELD IN MILLIGAUSS*	
		AT CENTERLINE	AT 30 FEET FROM CENTERLINE
STANDARD CROSSARM	45	14	7
STANDARD CROSSARM	50	11	6

* Field level under the line at mid-span based on 300 amps, balanced loading, one meter above ground level.

APPENDIX C

PROPERTY OWNERS WITHIN THE PROPOSED RIGHT-OF-WAY

PARCEL #	PROPERTY OWNER
1	PPL Electric Utility Corporation
2	Pequea Township

APPENDIX D

LIST OF GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES

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1. Attn: Mr. Kurt W. Carr, Chief
   Pennsylvania Historical and Museum Commission
   Bureau for Historic Preservation
   Division for Archaeology and Protection
   P.O. Box 1026
   Harrisburg, Pennsylvania 17108-1026

2. Attn: The Honorable Allen D. Biehler, P.E., Secretary
   Pennsylvania Department of Transportation
   Commonwealth Keystone Building
   400 North Street, 8th Floor
   Harrisburg, Pennsylvania 17120

3. Attn: Office of Field Operations
   Department of Environmental Protection
   P. O. Box 2063
   Market Street Office Building
   Harrisburg, Pennsylvania 17105-2063

4. Lancaster County Commissioners
   50 N. Duke Street
   PO Box 83480
   Lancaster, Pennsylvania 17608-3480
   Attn: Mr. Howard Shaub, Chairman

5. Lancaster County Planning Commission
   50 N. Duke Street
   PO Box 83480
   Lancaster, Pennsylvania 17608-3480
   Attn: Mr. Ronald Bailey, Executive Director

6. Pequea Township Board of Supervisors
   1028 Millwood Road
   Willow Street, Pennsylvania 17584
   Attn: Ms. Virginia Brady, Chairperson

7. Pequea Township Planning Commission
1028 Millwood Road
Willow Street, Pennsylvania 17584
Attn: Mr. Robert Heckrote, Chairman

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P. O. BOX 3265, HARRISBURG PA 17105-3265

IN REPLY PLEASE
REFER TO OUR FILE
Secretary
717-772-7777

February 9, 2005

A-110500 F0351

MORGAN LEWIS & BOCKIUS LLP
ATTN; ANTHONY C. DECUSATIS
1701 MARKET STREET
PHILADELPHIA PA 19103-2921

Dear Mr. DeCusatis:

Receipt is acknowledged of the Letter of Notification of PPL Electric Utilities Corporation, which has been captioned and docketed to the above number.

This matter will receive the attention of the Commission and you will be advised of any further necessary procedure.

Sincerely,

James J. McNulty
Secretary

JJM:jih

COMMONWEALTH OF PENNSYLVANIA

DATE: February 9, 2005

SUBJECT: A-110500 F0351

TO: Bureau of Fixed Utility Services

FROM: James J. McNulty, Secretary

Letter of Notification of PPL Electric Utilities Corporation

We attach hereto a copy of the Letter of Notification of PPL Electric Utilities Corporation, which has been captioned and docketed to the above number.

May we have a report prepared by your Bureau for Public Meeting.

Attachment

cc: Law Bureau

jih

Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Tel: 215.963.5000
Fax: 215.963.5001
www.morganlewis.com

ORIGINAL

Morgan Lewis
COUNSELORS AT LAW

Anthony C.DeCusatis
215.963.5034
adecusatis@morganlewis.com

April 4, 2005

VIA OVERNIGHT MAIL

James J. McNulty, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

Re: **Letter Of Notification Of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To The Manor-South Akron 230 kV Line Modification To Be Constructed In Pequea Township, Lancaster County—Docket No. A-110500 F0351**

Dear Secretary McNulty:

Enclosed for filing please find an original and three copies of the Proof of Publication for the Intelligencer Journal – New Era, a newspaper of general distribution in the project area, of the Public Notice for the above-referenced Letter of Notification. Publication occurred twice during two consecutive weeks.

Very truly yours,

Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

Enclosure

cc: Darren Gill (w/ encl) (via fax and overnight mail)

RJP

150

Invoice No. 1359588

PROOF OF PUBLICATION NOTICE IN

DOCUMENT FOLDER

State of Pennsylvania}
} ss:
County of Lancaster}

Sharon L. Daly of the County and State aforesaid, being duly sworn, deposes and says that the Intelligencer Journal-New Era a daily newspaper of general circulation published at Lancaster, County and State aforesaid, was established 1794-1877 since which date said daily newspaper has been regularly issued in said county, and that a copy of the printed notice or publication is attached hereto exactly the same as was printed and published in the regular editions and issues of said daily newspaper on the following dates, viz:

25TH DAY OF FEBRUARY AND THE 4TH DAY OF MARCH 2005

Affiant further deposes that she is the Billing Clerk duly authorized by the Lancaster Newspapers, Inc., a corporation, publisher of said Intelligencer Journal-Lancaster New Era-Sunday News a newspaper of general circulation to verify the foregoing statement under oath, and also declares that affiant is not i aforesaid notice or advertisement and that all allegations in the f nd character of publication are true.

(Signature)

COPY OF NOTICE OF PUBLICATION

Sworn and subscribed to before me this
4TH DAY OF MARCH 2005

Notary Public

My commission expires

NOTARIAL SEAL
CAROLE A. GOOD, NOTARY PUBLIC
LANCASTER, LANCASTER CO., PA
MY COMMISSION EXPIRES FEB 25, 2006

PUBLIC NOTICE

NEW TRANSMISSION TAP LINES

PPL Electric Utilities Corp. proposes to construct two new single circuit 230,000-volt transmission tap lines fro the existing Manor-South Akron 230 kV Transmission Line to provide the electrical supply to the proposed Millwood 230-69 kV Substation. The project area is located in Pequea Township, Lancaster County.

This project is required to maintain reliable electrical service to southern Lancaster County.

If you would like more information on this project, please contact PPL's John M. Levitski at (717) 560-2533.

On February 3, 2005 PPL filed an application with the Pennsylvania Public Utility Commission, which must approve the project before PPL can begin. A copy of the application is available for public inspection on weekdays during business hours at:

PPL Lancaster Service Center
651 Delp Road
Lancaster, PA 17601-3034

If you wish to participate in the PUC application process, you should contact within 15 days:

James J. McNulty, Esquire
Prothonotary
Pennsylvania Public Utility Commission
PO Box 3265
Harrisburg, PA 17105-3265

As a reference aid, be sure to include the project's "docket number," which is A-110500 F0351.