

CAPTION SHEET

CASE MANAGEMENT SYSTEM

| | | |
|------------------------------|---|-----------------------------|
| 1. REPORT DATE: 00/00/00 | : | |
| 2. BUREAU: FUS | : | |
| 3. SECTION(S): | : | |
| 5. APPROVED BY: | : | 4. PUBLIC MEETING DATE: |
| DIRECTOR: | : | 00/00/00 |
| SUPERVISOR: | : | |
| 6. PERSON IN CHARGE: | : | 7. DATE FILED: 06/23/05 |
| 8. DOCKET NO: A-110500 F0358 | : | 9. EFFECTIVE DATE: 00/00/00 |

PARTY/COMPLAINANT: HANOVER TOWNSHIP, NORTHAMPTON 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 WESTGATE 138/69 KV TAP-ADD SECOND CIRCUIT, LOCATED IN HANOVER TOWNSHIP, NORTHAMPTON COUNTY.

DOCKETED
 JUN 27 2005

DOCKETED
 JUN 27 2005

DOCUMENT FOLDER

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
adecusatis@morganlewis.com

June 23, 2005

RECEIVED

JUN 23 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

VIA FEDERAL EXPRESS

James J. McNulty
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
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 Westgate 138/69 kV Tap – Add Second Circuit, Located In Hanover Township, Northampton County**

Dear Secretary McNulty:

A-110500 FD 358

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 add a second circuit to the existing Westgate 138/69 kV Tap Line. This Letter of Notification is filed pursuant to the Commission's regulations at 52 Pa. Code Section 57.72(d).

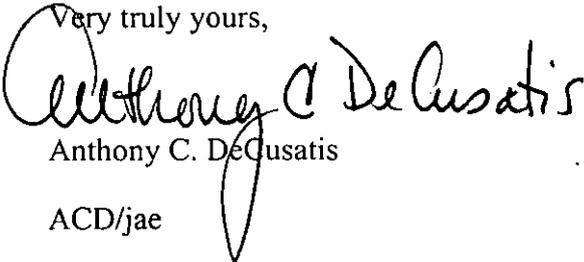
Copies of the Letter of Notification have been served upon the parties listed on the attached Certificate of Service. The enclosed documents are to be deemed filed on the date shown above, which is the date they were deposited with an overnight express delivery service as shown on the delivery receipt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

DOCKETED DOCUMENT
JUN 27 2005 FOLDER

James J. McNulty
June 23, 2005
Page 2

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

ACD/jae

c: Darren Gill

RECEIVED

JUN 23 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

ORIGINAL

RECEIVED

JUN 23 2005

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Re: Letter of Notification of PPL Electric
Utilities Corporation Filed Pursuant To 52
Pa. Code Chapter 57 Subchapter G With
Respect To The Westgate 138/69 kV Tap –
Add Second Circuit, Located In Hanover
Township, Northampton County

Docket No. A-110500 F0358

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 add a second circuit to the vacant side of the existing Westgate 138/69 kV Tap Line in Hanover Township, Northampton County, in order to (1) reduce the forecasted summer peak load on the Siegfried-Quarry #2 69 kV Transmission Line so as not to exceed the line’s normal capacity rating; and (2) provide a separate source of supply to each of the two transformers at the Westgate 69-12 kV Substation, thereby increasing reliability. Subject to the Commission’s siting approval, as requested herein, the construction of this project will begin in February 2006 to support the required in-service date in May 2006. Accompanying this Letter of Notification is a separately bound volume containing Exhibits A-C and Appendices A-C, 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).

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JUN 21 2005

2. The applicant is PPL Electric Utilities Corporation (“PPL”), Two North Ninth Street, Allentown, Pennsylvania 18101, a public utility incorporated in Pennsylvania for the

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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.

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. The Westgate 69-12 kV Substation contains two transformers. Both transformers, and, therefore, the entire load, of the substation are presently served by the Siegfried-Quarry #2 69 kV Transmission Line via the existing single circuit Westgate 138/69 kV Tap. Under this arrangement, one fuse protects both transformers, as shown in Figure 1 of Exhibit A. The Siegfried-Quarry #2 69 kV Transmission Line has a normal capacity rating of 43 MVA. The summer peak load on this circuit is forecasted to reach 46 MVA as early as 2006. Consequently, steps must be taken to reduce the load on that line. In addition, given the present configuration of the Westgate 69-12 kV Substation, either a blown fuse or the loss of the existing Westgate 138/69 kV Tap would take the entire substation out of service. During periods of high demand, the loss of the Westgate 69-12 kV Substation for either stated reason would interrupt approximately 20 MVA of load, or approximately 1150 customers, until repairs could be made.

5. In order to alleviate the problems outlined in the preceding paragraph, PPL plans to do two things. First, with PUC approval, PPL will add a second 138/69 kV circuit on the vacant side of the existing Westgate 138/69 kV Tap. This circuit will be approximately 1.28 miles in length and will run from the Siegfried-Quarry #1 69 kV Transmission Line to the Westgate 69-12 kV Substation. The addition of the second circuit will split the Westgate 69-12 kV Substation load between the Siegfried – Quarry #1 and #2 Transmission Lines. This configuration will transfer approximately 10 MVA from the Siegfried – Quarry #2 Line to the Siegfried – Quarry #1 Line, thereby reducing forecasted 2006 summer peak load on the #2 line to 36 MVA, which is within that line's rating. Second, the Westgate 69-12 kV Substation will be modified so that a separate tap line serves each transformer. This modification will allow at least half of the substation to remain in service if one of the transformers or one of the transmission tap lines should fail. Figures 3 and 4 in Exhibit A show the proposed transmission line and substation modifications. The proposed additions and modifications will reduce a forecasted overload on the Siegfried – Quarry #2 69 kV Transmission Line, increase service reliability and improve operating flexibility.

6. As previously explained, the proposed transmission line project involves the addition of a second circuit to the existing Westgate 138/69 kV Tap Line. Three arms will be added to each of the existing structures to accommodate the installation of the proposed tap line. One additional pole, approximately 60 feet tall, and its associated foundation, will be installed where the proposed new circuit taps the existing Siegfried-Quarry 69 kV Transmission Line. This additional pole will be within PPL's existing right-of-way. The proposed second circuit will consist of three power conductors of 556.5 KCMIL 24/7 standing ACSR. The existing overhead ground wire will protect both circuits.

7. The project will be designed, constructed, operated and maintained in a manner that satisfies or surpasses National Electrical Safety Code (“NESC”) standards and all applicable legal requirements. The proposed project will not create an unreasonable risk of danger to the public health or safety. Descriptions of NESC standards and PPL’s design criteria and safety practices are set forth in Appendix A. Minimum conductor-to-ground clearances for the Westgate #2 138/69 Tap Line are explained in Exhibit B.

8. All of the necessary right-of-way for this project is already owned by PPL. No additional right-of-way is required.

9. The project described herein is proposed to begin in February 2006 in order to support a proposed in-service date in May 2006. The estimated cost to add a second circuit to the Westgate 138/69 kV Tap is \$318,000.

10. The proposed addition of a second circuit to the Westgate 138/69 kV Tap Line will have few, if any, impacts because only one new tapping structure is being constructed and that structure will be located on PPL’s existing property and right-of-way, where a transmission line already exists. No railroads, communications towers, pipelines, or other utilities will be affected by the proposed reconstruction. The Lehigh Valley International Airport is approximately 2.7 miles from the location of the one new structure and will not be affected by this project. This project was reviewed with Hanover Township and Northampton County, and neither has any objection.

11. A project review by the Pennsylvania Historical and 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.

12. 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. No tree clearing is required. 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.

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

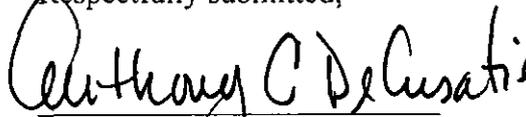
14. As soon as practicable after the filing of this Letter of Notification, PPL will publish notice of the filing in newspapers of general circulation in the area of the proposed project. Such notice will contain: (a) the date this Letter of Notification was filed with the Commission; (b) a brief description 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.

15. 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 addition of the Westgate 138/69 kV Tap 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: June 23, 2005

AFFIDAVIT

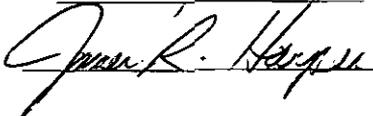
COMMONWEALTH OF PENNSYLVANIA) SS
 :
COUNTY OF LEHIGH :
 :
)

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 27th day
of June, 2005.



Notarial Seal
James R. Harper, Notary Public
City Of Allentown, Lehigh County
My Commission Expires Dec. 23, 2006
Member, Pennsylvania Association Of Notaries

ORIGINAL

**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 Westgate 138/69 kV
Tap – Add Second Circuit, in Hanover
Township, Northampton County**

Docket No.

A-110500 F0350 JUN 23 2005

RECEIVED

**PA PUBLIC UTILITIES COMMISSION
SECRETARY'S BUREAU**

CERTIFICATE OF SERVICE

I hereby certify that I have, this 23 day of June, 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. Douglas C. McClearen, 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

DOCKETED

JUN 21 2005

**DOCUMENT
FOLDER**

Northampton County
Northampton County Government Center
669 Washington Street
Easton, PA 18042

Attn: Mr. Glenn F. Reibman
County Executive

Lehigh Valley Planning Commission
961 Marcon Blvd., Suite 310
Allentown, PA 18103-9397

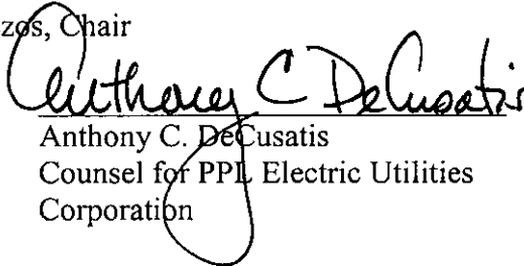
Attn: Mr. Michael N. Kaiser,
Executive Director

Hanover Township
5421 Place Road
Bethlehem, PA 18017

Attn: Mr. James Sterner, Manager

Hanover Township
Planning Commission
4285 Vassar Avenue
Bethlehem, PA 18107

Attn: Mark Tanczos, Chair


Anthony C. DeCusatis
Counsel for PPL Electric Utilities
Corporation

June 23, 2005

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

June 27, 2005

A-110500 F0358

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

DOCKETED
JUN 27 2005

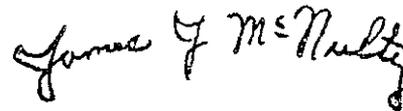
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Dear Mr. DeCusatis:

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

DATE: June 27, 2005

SUBJECT: A-110500 F0358

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

DOCUMENT
FOLDER

DOCKETED
JUN 27 2005

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

Morgan Lewis
C O U N S E L O R S A T L A W

Anthony C. DeCusatis
215.963.5034
adecusatis@morganlewis.com

**DOCUMENT
FOLDER**

RECEIVED

July 20, 2005

JUL 20 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

VIA FEDERAL EXPRESS

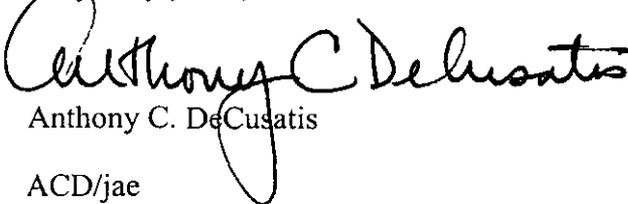
James J. McNulty
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

**Re: Letter Of Notification Of PPL Electric Utilities Corporation Filed Pursuant To 52
Pa. Code Chapter 57 Subchapter G With Respect To The Westgate 138/69 kV Tap -
Add Second Circuit, Located In Hanover Township, Northampton County
Docket No. A-110500 F0358**

Dear Secretary McNulty:

Enclosed for filing in the above-captioned matter are seven copies of a Certificate of Service evidencing service by Certified Mail - Return Receipt Request of the requisite notice and map upon the property owners whose land is traversed by the existing transmission line to which PPL Electric Utilities Corporation proposes to add a second circuit. Also enclosed is an additional copy of this letter, 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

ACD/jae

c: Darren Gill (w/encl)

**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 Westgate 138/69 kV : Docket No. **A-110500 F0358**
Tap – Add Second Circuit, in Hanover :
Township, Northampton County :

CERTIFICATE OF SERVICE

I hereby certify that I have, this 20th day of July, 2005, served true and correct copies of the Property Owners Notice and accompanying map upon the persons and in the manner listed below.

BY CERTIFIED MAIL/RETURN RECEIPT REQUESTED

(PROPERTY OWNERS)

Hanover Pointe Associates
% Robert Gundlach, Jr., Esquire
Fox, Rothschild, LLP
102 N. Main St.
P. O. Box 1589
Doylestown, PA 18901

Joseph W. & Nancy C. Fixl
1010 Blair Road
Bethlehem, PA 1801

Diana L. Serfass
990 Blair Road
Bethlehem, PA 18017

David C. & Sharon J. Laughery
970 Blair Road
Bethlehem, PA 18017

Christopher D. & Patricia A. Horn
950 Blair Road
Bethlehem, PA 18017

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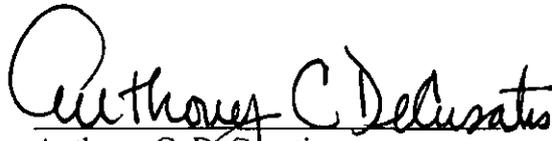
JUL 20 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY/REGISTRAR

Paul & Marybeth Karoly
930 Blair Road
Bethlehem, PA 18017

Mark C. & Michele Iampietro
910 Blair Road
Bethlehem, PA 18017

Gregory A. Gulick
3399 Bath Pike
Bethlehem, PA 18017


Anthony C. DeCusatis
Counsel for PPL Electric Utilities
Corporation

July 20, 2005

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JUL 20 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

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

Anthony C. DeCusatis
215.963.5034
adecusatis@morganlewis.com

ORIGINAL

**DOCUMENT
FOLDER**

July 21, 2005

VIA FEDERAL EXPRESS

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

RECEIVED
JUL 21 2005
PA PUE
SECRETARIAT & BUREAU
SECTION

Re: **Letter Of Notification Of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To The Westgate 138/69 kV Tap – Add Second Circuit, Located In Hanover Township, Northampton County Docket No. ~~A-110500-F0358~~**

Dear Secretary McNulty:

A-110500 F0358

Enclosed for filing in the above-captioned matter are seven copies of corrected and revised pages to the bound volume of exhibits accompanying PPL Electric Utilities Corporation's ("PPL") Letter of Notification requesting approval to add a second circuit to the existing Westgate 138/69 kV Tap Line, as follows:

| | |
|------------------------|---|
| Summary | The first page of the exhibits, titled "Summary" is revised to add "Appendix D – List of Property Owners Within the Proposed Right-Of-Way" to the index of exhibits and appendices. |
| Exhibit B (map pocket) | The map contained in the Exhibit B map pocket is being replaced with a corrected map that correctly delineates the property owners within the right-of-way. |

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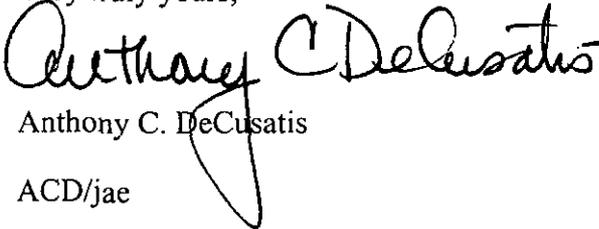
James J. McNulty
July 21, 2005
Page 2

| | |
|--------------------|---|
| List of Appendices | The list of Appendices that precedes the Appendices has been revised to add Appendix D |
| Appendix D | Appendix D has been added, which shows the names and addresses of the eight property owners within the right-of-way of the line to which a second circuit is being added. |

Copies of the enclosed revised pages have been served upon the governmental bodies listed on the attached Certificate of Service.

Also enclosed is an additional copy of this letter, 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

ACD/jae

c: Per the Certificate of Service (w/encl)
Darren Gill (w/encl)

SUMMARY

This filing is submitted by PPL Electric Utilities Corporation (PPL) pursuant to the Pennsylvania Public Utility Commission's (PUC, or the Commission) regulations at 52 Pa. Code §§57.71 through 57.77 for PUC approval to add a second 138/69 kV circuit to the existing Westgate 138/69 kV Tap. The proposed second circuit is required to meet the increasing demand for electricity and improve reliability. It will also allow substation maintenance to be performed during normal working hours with no interruption of service.

The estimated cost to design and install the second Westgate 138/69 kV Tap is \$318,000. Construction is scheduled to begin in February 2006 to support the project's in-service date of May 2006.

This document, which describes the need for the project and discusses the engineering and siting analysis for the proposed construction, 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 - List of Involved Governmental Agencies, Municipalities, and Other Public Entities
- Appendix D - List of Property Owners Within the Proposed Right-of-Way

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JUL 21 2005
PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

LIST OF APPENDICES

- APPENDIX A - PPL Design Criteria and Safety Practices
- APPENDIX B - Magnetic Field Management at PPL
- APPENDIX C - List of Involved Governmental Agencies, Municipalities, and Other Public Entities
- APPENDIX D - List of Property Owners Within the Proposed Right-of-Way

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JUL 27 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

APPENDIX D

LIST OF PROPERTY OWNERS WITHIN THE PROPOSED RIGHT-OF-WAY

1. Hanover Pointe Associates
% Robert Gundlach, Jr., Esquire
Fox, Rothschild, LLP
102 N. Main St.
P. O. Box 1589
Doylestown, PA 18901
2. Joseph W. & Nancy C. Fixl
1010 Blair Road
Bethlehem, PA 18017
3. Diana L. Serfass
990 Blair Road
Bethlehem, PA 18017
4. David C. & Sharon J. Laughery
970 Blair Road
Bethlehem, PA 18017
5. Christopher D. & Patricia A. Horn
950 Blair Road
Bethlehem, PA 18017
6. Paul & Marybeth Karoly
930 Blair Road
Bethlehem, PA 18017
7. Mark C. & Michele Iampietro
910 Blair Road
Bethlehem, PA 18017
8. Gregory A. Gulick
3399 Bath Pike
Bethlehem, PA 18017

RECEIVED
JUL 21 2005
PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**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 Westgate 138/69 kV : **Docket No. Docket No. F-110500**
Tap – Add Second Circuit, in Hanover : **F0358F-110500 F0358**
Township, Northampton County :

CERTIFICATE OF SERVICE

I hereby certify that I have, this 21 day of July, 2005, served true and correct copies of the revised Summary, revised list of Appendices and Appendix D to the above filing 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
400 North Street, 2nd Floor
Harrisburg, PA 17120-0093
Attn: Mr. Douglas C. McClearen, 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

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JUL 21 2005
PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Northampton County
Northampton County Government Center
669 Washington Street
Easton, PA 18042

Attn: Mr. Glenn F. Reibman
County Executive

Lehigh Valley Planning Commission
961 Marcon Blvd., Suite 310
Allentown, PA 18103-9397

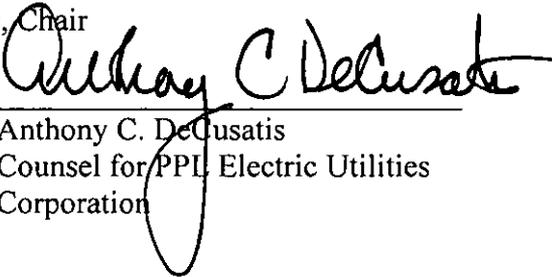
Attn: Mr. Michael N. Kaiser,
Executive Director

Hanover Township
5421 Place Road
Bethlehem, PA 18017

Attn: Mr. James Sterner, Manager

Hanover Township
Planning Commission
4285 Vassar Avenue
Bethlehem, PA 18107

Attn: Mark Tanczos, Chair



Anthony C. DeCusatis
Counsel for PPI Electric Utilities
Corporation

July 21, 2005

PA PUEB...
SECRETARIAT...
JUL 2 1995

RECEIVED

**OVERSIZED
DOCUMENT(S)**



PPL ELECTRIC UTILITIES

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| ACCT- 161590 | | WESTGATE 138/69KV TAP PLAN EXHIBIT | |
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| HANOVER TWP. | | NORTHAMPTON CO., PA. | |
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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU



Before the
Pennsylvania Public Utility Commission

Westgate 138/69 kV Tap- Add Second Circuit

Letter of Notification

Application Docket No. A-110500 F0358

Submitted by: PPL Electric Utilities Corp.

DOCKETED

JUN 27 2005

DOCUMENT
FOLDER

SUMMARY

This filing is submitted by PPL Electric Utilities Corporation (PPL) pursuant to the Pennsylvania Public Utility Commission's (PUC, or the Commission) regulations at 52 Pa. Code §§57.71 through 57.77 for PUC approval to add a second 138/69 kV circuit to the existing Westgate 138/69 kV Tap. The proposed second circuit is required to meet the increasing demand for electricity and improve reliability. It will also allow substation maintenance to be performed during normal working hours with no interruption of service.

The estimated cost to design and install the second Westgate 138/69 kV Tap is \$318,000. Construction is scheduled to begin in February 2006 to support the project's in-service date of May 2006.

This document, which describes the need for the project and discusses the engineering and siting analysis for the proposed construction, consists of the following exhibits and appendices:

- Exhibit "A" - Necessity Statement
- Exhibit "B" - Engineering Description
- Exhibit "C" - Environmental Assessment

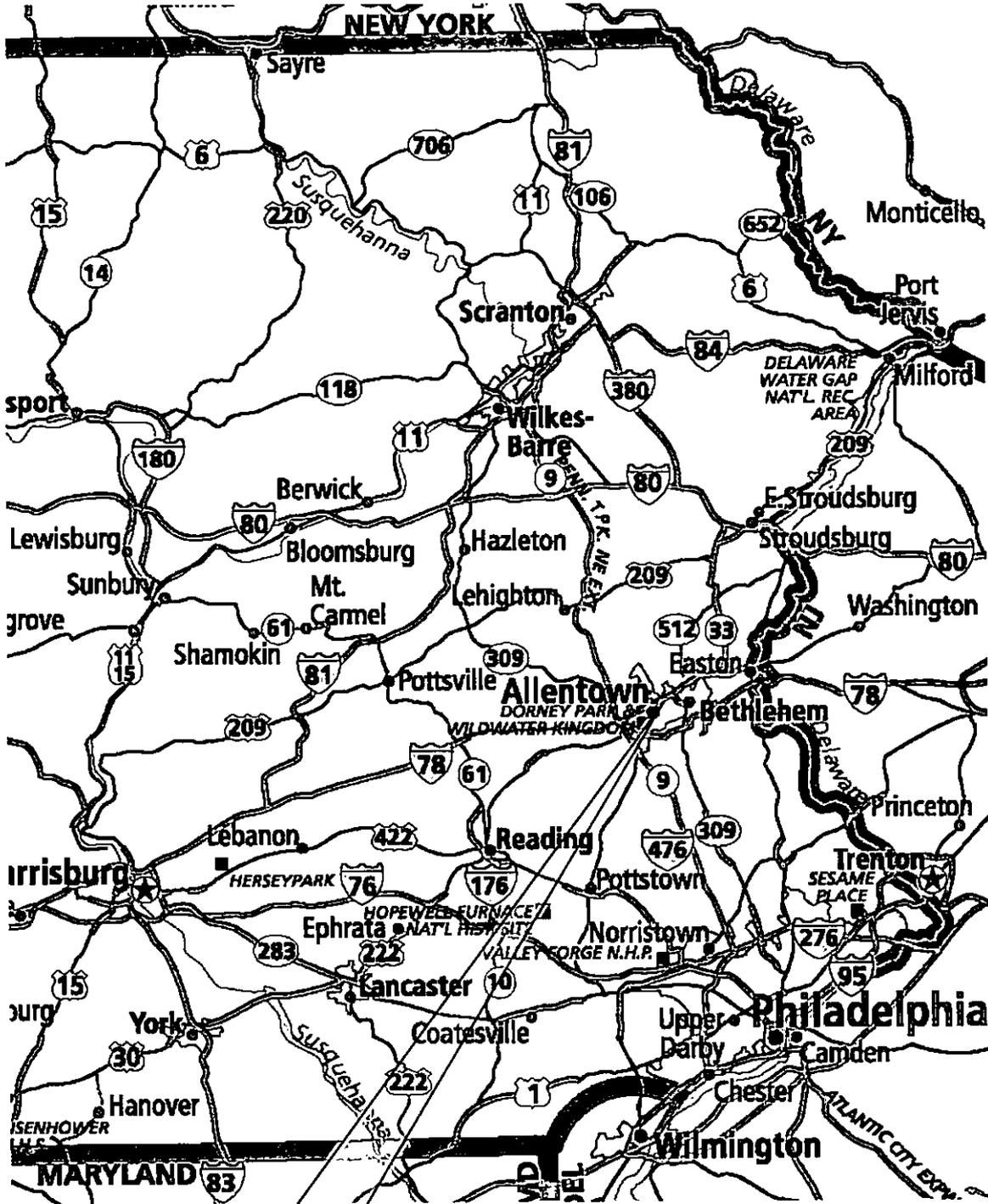
- Appendix A - PPL Design Criteria and Safety Practices
- Appendix B - Magnetic Field Management at PPL
- Appendix C - List of Involved Governmental Agencies, Municipalities, and Other Public Entities

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PA PUBLIC UTILITY COMMISSION
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LOCATION MAP



PROJECT LOCATION

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Exhibit A

EXHIBIT "A"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
NECESSITY STATEMENT

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MAP

MAP 1 PPL SYSTEM MAP

EXHIBIT "A"
MAP POCKET

EXHIBIT "A"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
NECESSITY STATEMENT

A. INTRODUCTION

PPL proposes to install a second approximately 1.28 mile long 138/69 kV transmission line circuit on the existing Westgate 138/69 kV Tap. The proposed new facility will extend from the Siegfried – Quarry #1 and #2 69 kV Transmission Line to the existing Westgate 69-12 kV Substation. The existing Westgate 138/69 kV Tap was designed and constructed to accommodate two 138/69 kV circuits, although only one circuit was installed initially. Like the existing Westgate Tap, the new tap will be designed and constructed for 138 kV operation, but initially, will operate at 69 kV.

The existing Westgate 138/69 kV Tap was placed in-service in the late 1970's and predated the requirements for PUC approval of new or rebuilt transmission lines designed to operate at 100 kV or greater. In 1998, the Company filed a "Letter of Notification" and the Commission approved the relocation of approximately 2,200 feet of the line to accommodate the widening of SR 22 (Docket No. A-110500 F0263). The proposed line is required to meet the increasing demand for electricity and improve service reliability in the area. Additionally, it will allow substation maintenance to be performed during normal working hours with no interruption of electric service.

The estimated cost of the additional second circuit is \$318,000. Installation is scheduled to begin in February 2006 to support the project's required in-service date of May 2006. The required in-service date is defined as the date the proposed facility needs to be placed in service to prevent overloads that have the potential to damage existing facilities and, thereby, cause the interruption of service to customers.

A PPL system map showing the existing transmission line 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 138 kV regional transmission system in the Hanover Township area.

B. EXISTING SYSTEM

The entire load of the Westgate 69-12 kV Substation is presently served by the Siegfried – Quarry #2 69 kV Transmission Line via the Westgate 138/69 kV Tap. Additionally, the two transformers at the Westgate 69-12 kV Substation are supplied by the existing single-circuit Westgate 138/69 kV Tap. Under this arrangement, one fuse protects both transformers. Figure 1 and Figure 2 at the end of this section depict the existing substation and transmission system arrangements.

C. DEFINITION OF THE PROBLEM

The Siegfried – Quarry #2 69 kV Transmission Line, which serves the entire load of the Westgate 69-12 kV Substation, was constructed with 4/0 copper conductors. The normal rating of these conductors is 43 MVA. The forecasted 2006 summer peak load on this circuit is estimated to be 46 MVA, which exceeds the normal rating of conductors of this type. Additionally, in its present configuration, either a blown transformer fuse or the loss of the Westgate 138/69 kV Tap will remove the entire substation from service. During periods of high summer demand, loss of the Westgate 69-12 kV Substation for any of the stated reasons will interrupt approximately 20 MVA of load, or approximately 1150 customers, until repairs can be made.

D. PROPOSED SOLUTION

In order to alleviate the problems cited above, the Company plans the following system additions and modifications. First, with PUC approval, PPL plans to extend a second, approximately 1.28 mile 138/69 kV Tap from the Siegfried – Quarry #1 69 kV Transmission Line on the vacant side of the existing Westgate 138/69 kV Tap. The proposed second circuit will split the Westgate 69-12 kV Substation load between the Siegfried – Quarry #1 and #2 Transmission Lines. This configuration will transfer approximately 10 MVA from the Siegfried – Quarry #2 Line to the Siegfried – Quarry #1 Line reducing the 2006 forecasted *summer peak load on the #2 line to 36 MVA*. Second, the Westgate 69-12 kV Substation will be modified so that a separate tap serves each transformer. This modification will allow at least half of the substation to remain in-service should one of the transformers or transmission tap lines fail.

The proposed additions and modifications will reduce a forecasted overload on the Siegfried – Quarry #2 69 kV Transmission Line and, at the same time, increase service reliability and improve operating flexibility. The total estimated cost of this solution is \$489,000 which includes the estimated \$318,000 cost for installation of the proposed second circuit on the Westgate Tap and \$171,000 for the substation modifications. Figures 3 and 4 at the end of this section depict the proposed substation and transmission system modifications, respectively.

E. FUNCTIONAL ALTERNATIVES

One other functional alternative was identified to resolve the problems noted above. This alternative would include the following work:

- Re-rate approximately 6.7 miles of the Siegfried-Quarry #2, 69 kV Transmission Line.
- Rebuild/replace numerous Siegfried-Quarry #2 structures/foundations for increased ground clearance.

The estimated cost of this alternative is \$2.2 million.

The preferred alternative identified under "Proposed Solution" above was selected because it is the more economical choice, provides greater operating flexibility and improved reliability.

FIGURE 1 – EXISTING SUBSTATION ARRANGEMENT

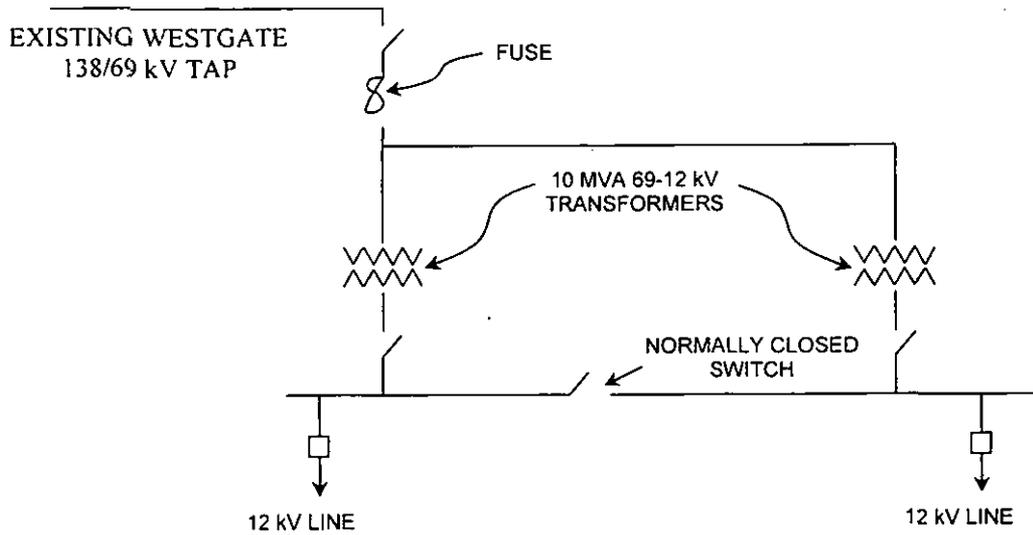


FIGURE 2 – EXISTING 138/69 kV TRANSMISSION SYSTEM

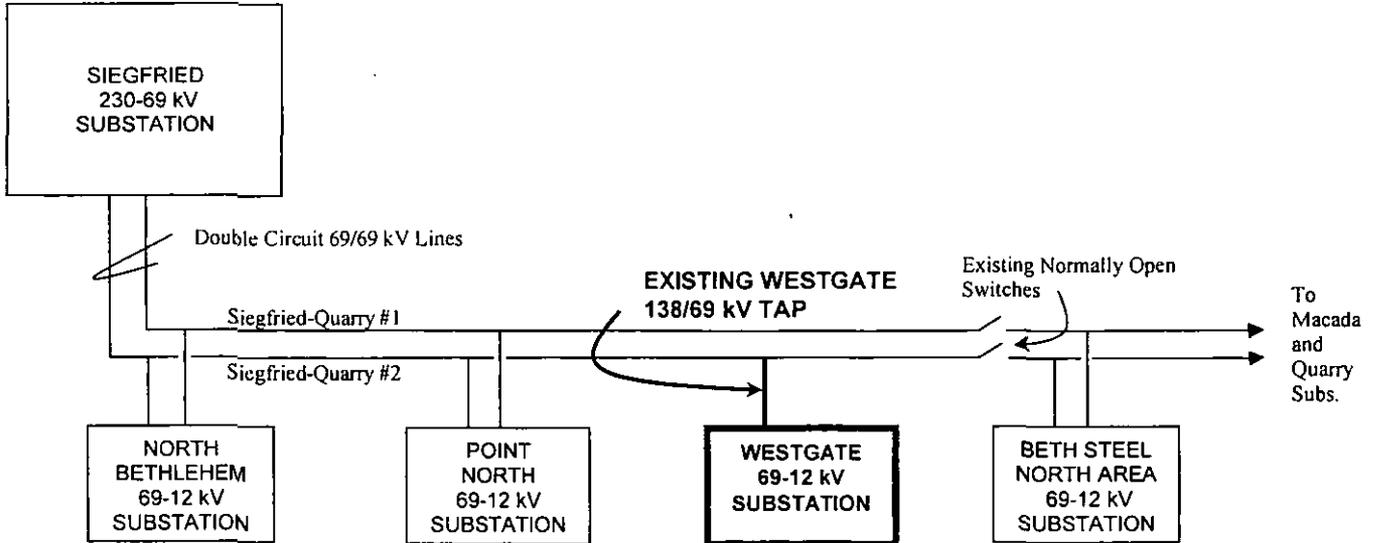


FIGURE 3 – FUTURE SUBSTATION ARRANGEMENT

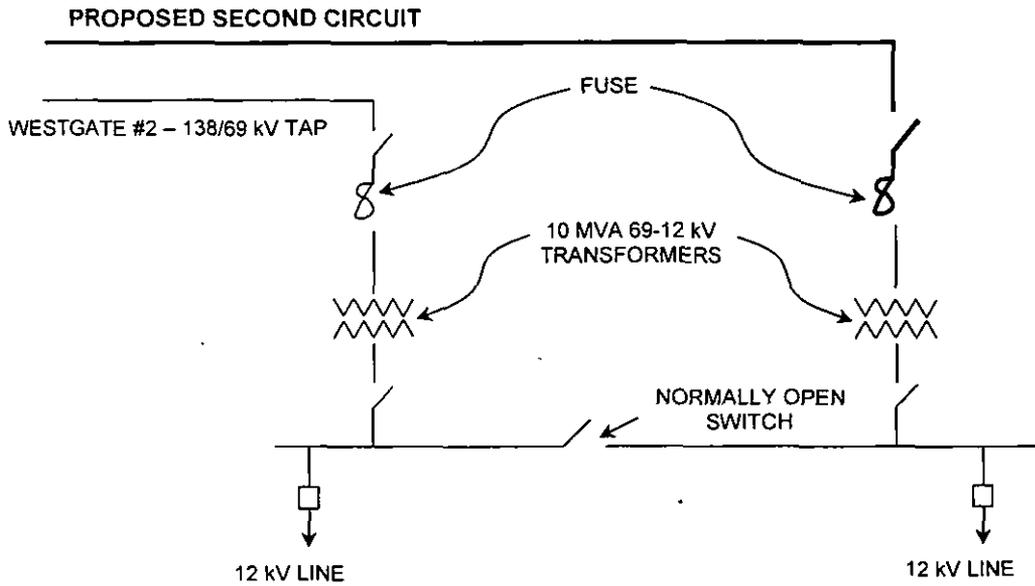
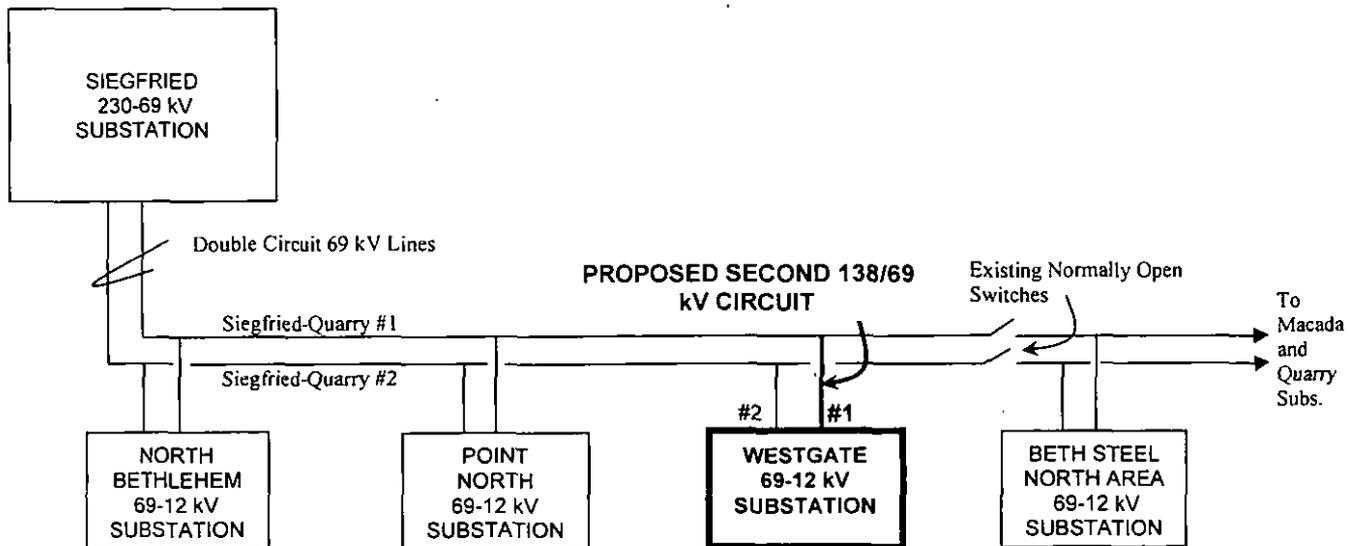
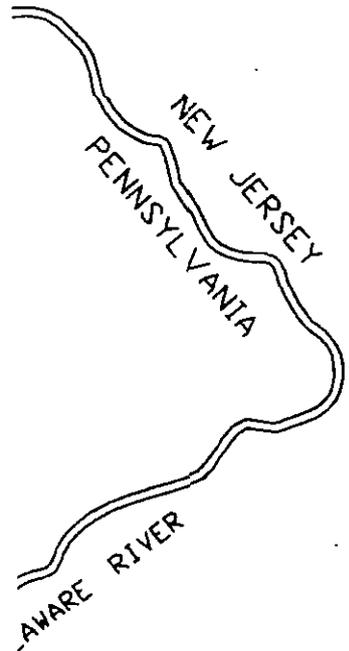


FIGURE 4 – PROPOSED 138/69 kV TRANSMISSION SYSTEM





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PPL ELECTRIC UTILITIES

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| ACCT- 805201 | | ELECTRICAL SYSTEM MAP | |
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| BY- | | | |
| REVIEWED | | WESTGATE TAP. ADD SECOND CIRCUIT | |
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| G. HAKUN III | | 7/17/85 | |
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| D191830 | | 1 | 29 |

Exhibit B

EXHIBIT "B"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
ENGINEERING DESCRIPTION

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EXHIBIT "B"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
ENGINEERING DESCRIPTION

A. DESCRIPTION OF PROPOSED LINE

PPL proposes to add a second 138/69 kV circuit to the existing Westgate 138/69 kV Tap. The proposed line will supply electricity directly to a second transformer in PPL's Westgate 69-12 kV Substation. The project is located in Hanover Township, Northampton County. A plot plan for the transmission line project is provided in the Exhibit "B" map pocket.

The proposed second circuit will be approximately 1.28 miles long. Three arms will be added to each of the existing structures to accommodate the installation of the proposed tap line. One additional pole, approximately 60 feet tall, and its associated foundation will be installed where the proposed new circuit taps the existing Siegfried – Quarry 69 kV Transmission Line, which is within PPL's existing right-of-way. The proposed second circuit will consist of three power conductors. The conductors will be 556.5 KCMIL 24/7 stranding ACSR. No additional overhead ground wire is required because the existing ground wire provides the appropriate protection.

The proposed line will be designed to, and generally exceed, National Electrical Safety Code (NESC) standards. Design specifications and safety rules practiced by PPL are included in Appendix A. As previously discussed in Exhibit "A", in 1998 an approximate 2,200 foot section of the line was reconstructed and relocated due to the widening of SR 22. This relocated line section was built utilizing the PPL standard 30-foot ground clearance. However, the older section of line, built in the late 1970s, was designed with a 27-foot ground clearance. Along the older section of the line, the minimum conductor-to-ground clearance at a maximum conductor temperature of 125°C will be 27 feet, because the

proposed second circuit will be supported by existing structures that were designed and constructed for 27 foot clearances. While 27-foot ground clearance is lower than the 30-foot ground clearance specified by PPL's current design criteria for new transmission lines (Appendix A), it is six feet more than the NESC required clearance of 21 feet. Prior to 1994, PPL's design criteria for transmission lines designed for 138 kV operation specified a minimum ground clearance of 25 feet. In 1994, PPL increased the minimum ground clearance of its design specification for 138 kV lines to 30 feet as part of its Magnetic Field Management Program. Because the proposed additional circuit will be installed on the vacant side of an existing single circuit line that was built in the late 1970s to meet PPL's then-approved clearances, a minimum conductor-to-ground clearance in excess of 27 feet is not possible without completely rebuilding this section of the Westgate Tap. Rebuilding the existing line is not feasible and would not be consistent with the "low or no cost" criterion of PPL's Magnetic Field Management Program. However, as explained in Section B (Magnetic Field Management), reverse phasing of the Westgate Tap Lines when the second circuit is installed is feasible at low or no cost and, therefore, will be employed by PPL. Reverse phasing of the double circuit line will reduce the magnetic fields of the double circuit line section. The Magnetic Field Management Program is described in greater detail in Appendix B.

The designed minimum conductor clearances and conductor thermal ratings for the section of line constructed in the late 1970s are as follow:

TABLE 1
DESIGN MINIMUM CONDUCTOR CLEARANCES
FOR 556.5 KCMIL 24/7 STRANDING ACSR*

| <u>Condition</u> | <u>Transmission Double-Circuit Design Clearance-to-Ground</u> |
|---|---|
| Normal load average weather (16°C ambient temperature) | 29.7 feet |
| Predicted extreme thermal load (125°C conductor temperature) | 27.0 feet |
| Predicted extreme weather conditions (1/2-inch ice, 8 lbs. wind, -18°C) | 30.2 feet |

*Clearances based on a maximum tension of 3540 pounds and a ruling span of 290 feet.

CONDUCTOR THERMAL RATING
556.5 KCMIL 24/7 STRANDING ACSR
(257°F) 125°C MAXIMUM CONDUCTOR TEMPERATURE

| Condition | <u>Ambient Temperature °C</u> | <u>Wind Speed Knots</u> | <u>Ampacity Amps</u> |
|------------------|-----------------------------------|-----------------------------|--------------------------|
| Summer Normal | 35 | 0 | 810 |
| Winter Normal | 10 | 0 | 920 |
| Summer Emergency | 35 | 1 1/2 | 1,030 |
| Winter Emergency | 10 | 1 1/2 | 1,150 |

B. MAGNETIC FIELD MANAGEMENT

PPL's Magnetic Field Management Program, summarized in Appendix B, is applied to new and reconstructed transmission line projects. To reduce magnetic field exposures, the program generally prescribes the use of a line design that provides five feet higher ground clearance and reverse phasing of new double circuit lines where it is feasible to do so at low or no cost. The implementation of additional modifications will be considered, provided those modifications can be made at low or no cost.

For this project, reverse phasing will be utilized to reduce magnetic field levels since this can be done at minimal or no cost. Increasing the ground clearance is not an option because the proposed new circuit will utilize existing poles as previously explained in Exhibits "A" and "B".

C. RIGHT-OF-WAY STATUS

All work will be completed on existing PPL right-of-way. No additional right-of-way is required.

Exhibit C

EXHIBIT "C"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
ENVIRONMENTAL ASSESSMENT

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EXHIBIT "C"
WESTGATE 138/69 kV TAP-ADD SECOND CIRCUIT
ENVIRONMENTAL ASSESSMENT

A. INTRODUCTION

PPL proposes to install a second, approximately 1.28 mile long, 138/69 kV circuit on the existing Westgate 138/69 kV Tap. The proposed second circuit requires installing one new structure where the proposed circuit ties into the supply line. Three new steel arms will be added to each of the existing structures to accommodate the new circuit.

The proposed project was reviewed with Hanover Township and Northampton County, and neither the Township nor the County has any objection. A list of involved governmental agencies, municipalities and other public entities is presented in Appendix C.

B. LAND USE

The existing Westgate 138/69 kV Tap parallels S. R. 22 for its entire length. Land use patterns on the side of the line opposite to S. R. 22 are a mixture of business, agricultural, and residential. Impacts to these areas will be minimal and largely confined to the period of time it will take to install the new facilities. The one new pole that is required will be located within existing PPL right-of-way in the parking area for a car dealership.

No nearby railroads, communication towers, pipelines or other utilities will be affected by the proposed project. Lehigh Valley International Airport is approximately 2.7 miles from the location of the new pole. There will be no impact on the airport or on flight operations. The new pole to be constructed will be shorter than PPL's existing supporting structures in the area.

C. **CULTURAL RESOURCES**

This project was reviewed with the Pennsylvania Historical and Museum Commission (PHMC). PHMC has determined that due to the absence of historical sites and the small project size no further archaeological investigations are required.

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 in the vicinity of the project. Impacts to these historic structures are not expected due to the small scope of the project.

D. **NATURAL FEATURES**

The proposed project will not affect any unique geological, scenic, or natural areas. No National Natural Landmarks, parks, recreational facilities, or natural areas are located near the project area. Tree clearing is not required. The line will not cross any wetlands or other aquatic resources. PP&L will employ its "Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way" as appropriate.

E. **THREATENED AND ENDANGERED SPECIES**

PPL has coordinated with different state and federal agencies to obtain information regarding endangered and threatened species that could occur in the study area. The agencies report that, except for occasional transient species of wildlife, no threatened or endangered plant or animal life is found in the project area.

Appendices

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- APPENDIX B - Magnetic Field Management at PPL
- APPENDIX C - List of Involved Governmental Agencies, Municipalities, and Other Public Entities

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

| <u>Surface Underneath Conductors</u> | <u>Vertical Clearance to Ground</u> | |
|---|-------------------------------------|------------|
| | 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

| <u>Surface Underneath Conductors</u> | <u>Vertical Clearance to Ground</u> | |
|---|-------------------------------------|------------|
| | 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

| <u>Surface Underneath Conductors</u> | <u>Vertical Clearance to Ground</u> | |
|---|-------------------------------------|------------|
| | 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:

| <u>Voltage-kV</u> | <u>Minimum Clearance</u> |
|-------------------|--------------------------|
| 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.



**MAGNETIC
FIELD
MANAGEMENT
PPL Electric Utilities
Corporation**

APPENDIX B

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

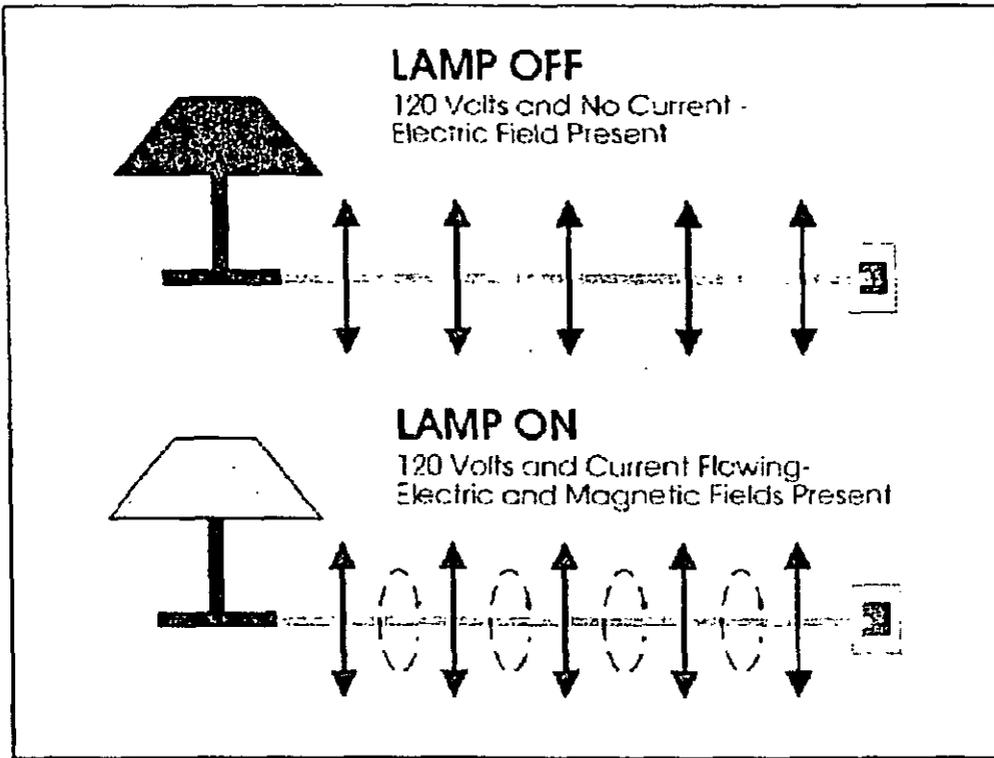


Figure 2

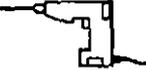
| Magnetic field strengths decrease with distance Magnetic fields are measured in milligauss | | Source: "EMF in Your Environment", U.S. Environmental Protection Agency 1992 | | |
|---|---|--|-----------|-----------|
| | | At 6 inches | At 1 foot | At 2 feet |
| Clothes dryer |  | 2 to 10 | * to 3 | * |
| Microwave oven |  | 100 to 300 | 1 to 200 | 1 to 30 |
| Toaster |  | 5 to 20 | * to 7 | * |
| Power drill |  | 100 to 200 | 20 to 40 | 3 to 6 |
| Can opener |  | 500 to 1500 | 40 to 300 | 3 to 30 |
| Mixer |  | 30 to 600 | 5 to 100 | * to 10 |
| Hair dryer |  | 1 to 700 | * to 70 | * to 10 |
| Color television |  | Data not available | * to 20 | * to 8 |

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.

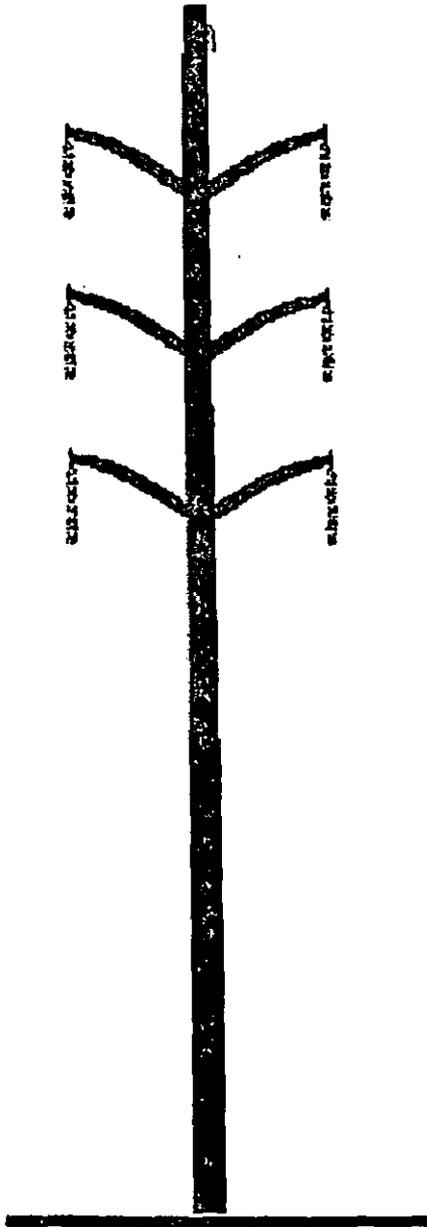
- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These 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.

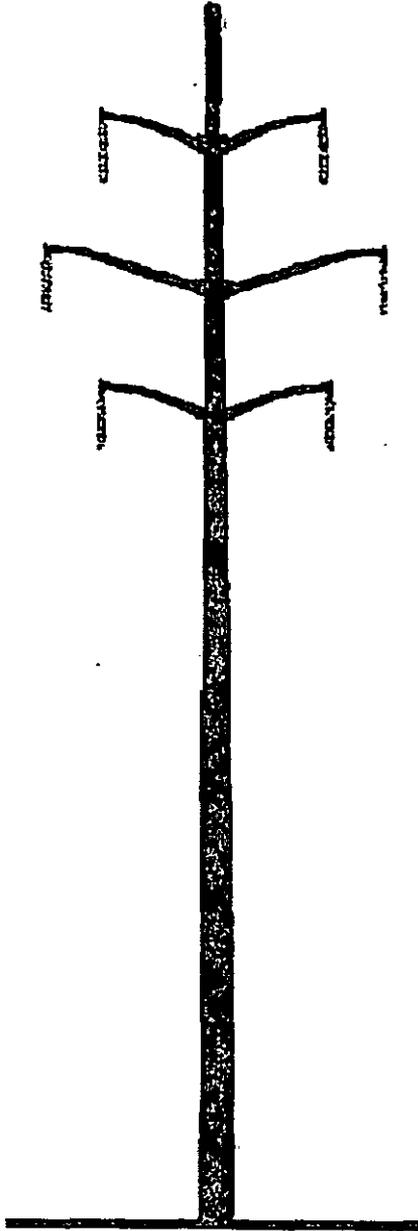
- The phase arrangement that produces the lowest field will be determined.
- The depth of burial of the line will be determined considering the cost of excavation and the location of other buried utilities in the area.
- The use of steel pipe ferromagnetic shielding that reduces magnetic fields will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



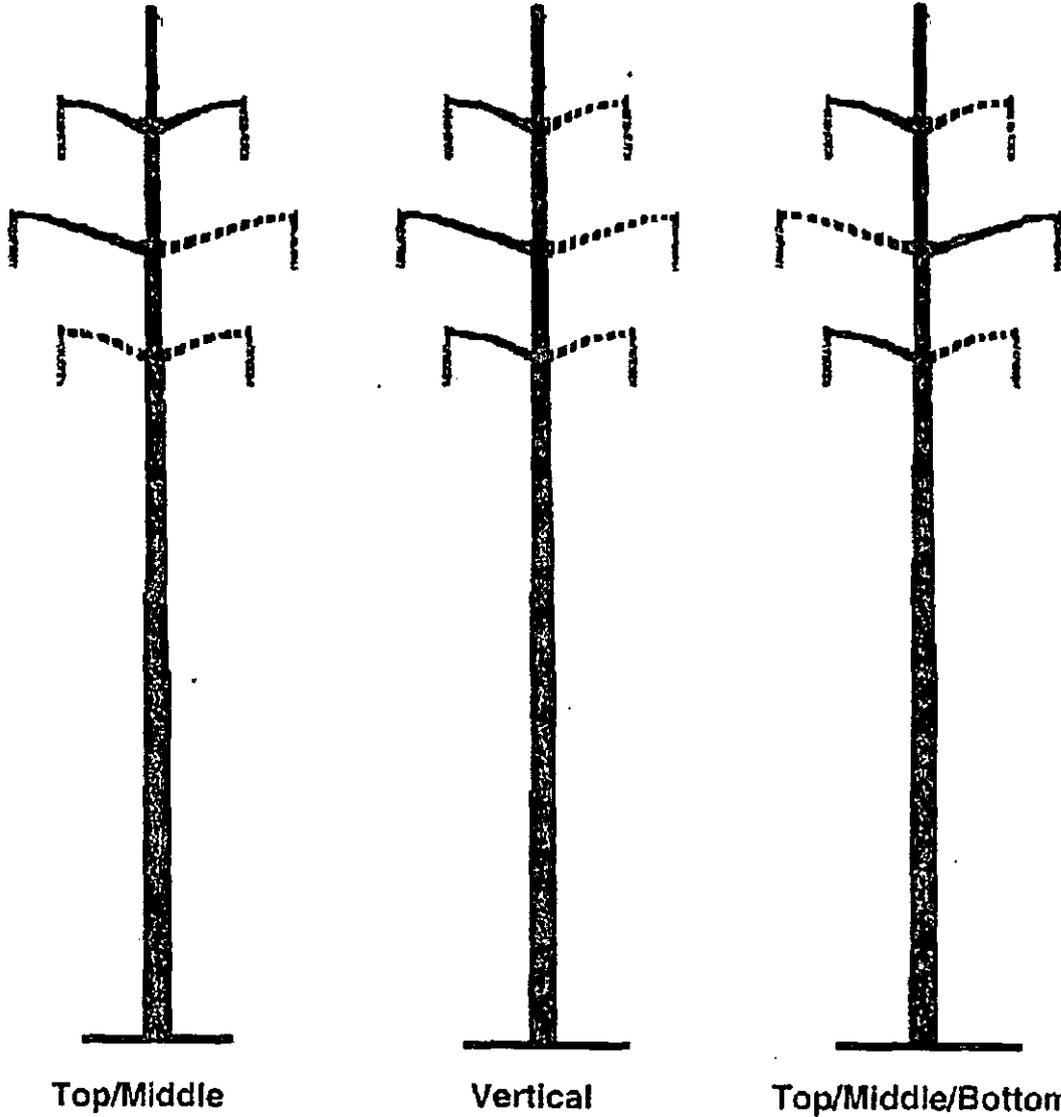
- Lower cost alternative
- Reduces magnetic fields due to higher structures
- Typical conductor data:
 - 1 3/8" HS steel overhead ground wire - 17.3 feet sag
 - 6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
 - Average span - 600 feet

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

| TYPE CONSTRUCTION | MAGNETIC FIELD IN MILLIGAUSS 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



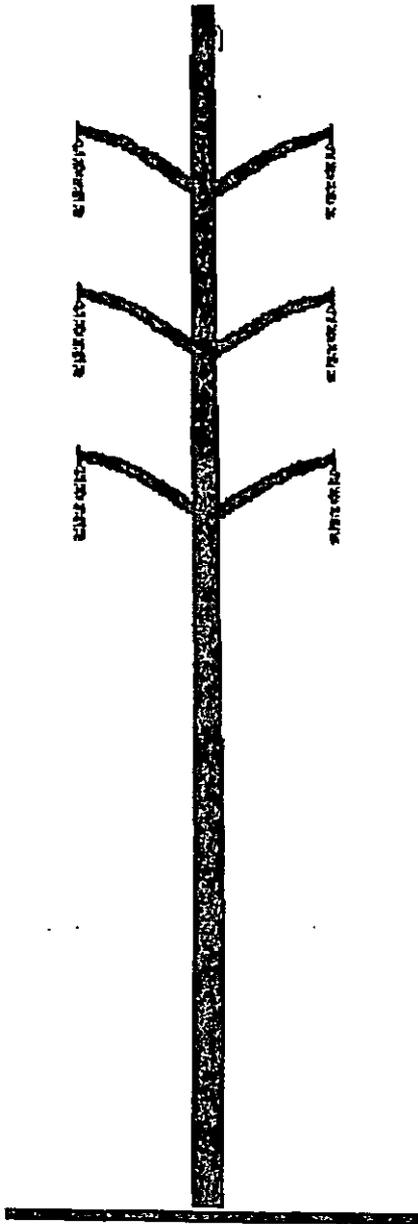
—— initial single circuit
- - - - future second circuit

**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 |

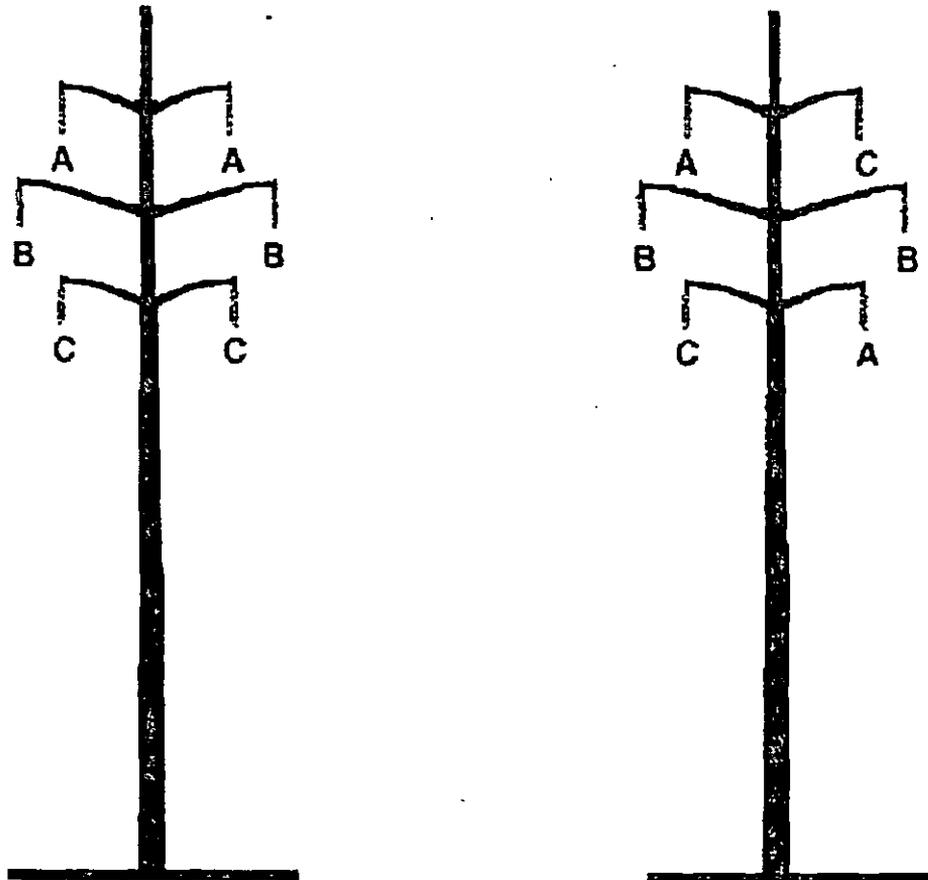
The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.

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 |

**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.

**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.

**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

LIST OF INVOLVED GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES

1. Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Division for Archaeology and Protection
P.O. Box 1026
Harrisburg, Pennsylvania 17108-1026
Attn: Mr. Douglas C. McLearn, Chief
2. Pennsylvania Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, Pennsylvania 17120
Attn: The Honorable Allen D. Biehler, P.E., Secretary
3. Department of Environmental Protection
P.O. Box 2063
Market Street State Office Building
Harrisburg, Pennsylvania 17105-2063
Attn: Office of Field Operations
4. Northampton County
Northampton County Government Center
669 Washington Street
Easton, PA 18042
Attn: Mr. Glenn F. Reibman, County Executive
5. Lehigh Valley Planning Commission
961 Marcon Blvd., Suite 310
Allentown, PA 18103-9397
Attn: Mr. Michael N. Kaiser, Executive Director
6. Hanover Township
5421 Place road
Bethlehem, PA 18017
Attn: Mr. N. James Sterner, Manager
7. Hanover Township Planning Commission
4285 Vassar Avenue
Bethlehem, PA 18017
Attn: Mark Tanczos, Chair

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

Morgan Lewis
C O U N S E L O R S A T L A W

Anthony C. DeCusatis
215.963.5034
adecusatis@morganlewis.com

August 18, 2005

VIA OVERNIGHT MAIL

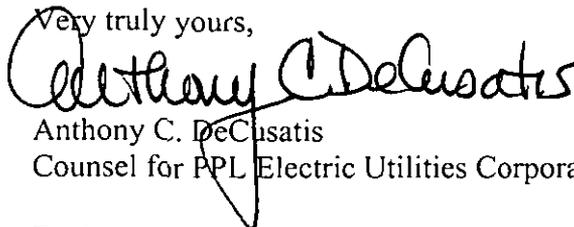
James J. McNulty, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

**Re: Letter Of Notification Of PPL Electric Utilities Corporation Filed Pursuant To
52 Pa. Code Chapter 57 Subchapter G With Respect To The Westgate 138/69
kV Tap – Add Second Circuit, Located In Hanover Township,
Northampton County
Docket No. A-110500 F0358**

Dear Secretary McNulty:

Enclosed for filing please find an original and three copies of the Proofs of Publication evidencing publication of the Public Notice for the above-referenced Letter of Notification on August 2 and 9, 2005 in The Morning Call and The Express Times, newspapers of general distribution in the project area.

Very truly yours,


Anthony C. DeCusatis
Counsel for PPL Electric Utilities Corporation

Enclosure

cc: Darren Gill

ORIGINAL
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AUG 18 2005

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

DOCUMENT
FOLDER

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No.

Term, 20Ja

Proof of Publication of Notice in The Express-Times

Under Act No. 587, approved May 16, 1929

DOCUMENT FOLDER

State of Pennsylvania ss:
County of Northampton

Rebecca Weaver, Credit, A/R, A/P manager of The Express-Times, doing business in the County and State aforesaid, being duly sworn, deposes and says that The Express-Times is a daily newspaper published at 30 No. 4th Street, City of Easton, County and State aforesaid, which was established in the year 1855, since which date said daily newspaper has been regularly issued in said County, and that a copy of the printed notice of publication is attached hereto exactly as the same was printed and published in the zoned editions and issues of the said daily newspaper on the following date, viz: 2nd and the 9th day of August, A.D. 2005.

DOCKETED
AUG 22 2005

PUBLIC NOTICE

TRANSMISSION LINE CONSTRUCTION

Electric Utilities Corp. (PPL) plans to add a second 138/69 circuit to serve Westgate Substation. This second circuit is approximately 1.28 miles long and will be attached to existing One new pole needs to be installed adjacent to Rt. 512 to connect the new circuit to the existing transmission system. The project area is located in Hanover Township, Northampton County.

Project is required to meet the increasing demand for electricity and to improve reliability of electrical service in the area.

If you would like more information about this project, please contact PPL Regional Community Relations Director, Kathy Frazier at (610) 774-3372.

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3630 Jacksonville, Road
Bethlehem, PA 18017

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

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

For reference aid, be sure to include the project's "docket number," which is A-110500 F0358.

Affiant further deposes that she is duly authorized by The Express-Times, a daily newspaper to verify the foregoing statement under oath and also declares that affiant is not interested in the subject matter of the aforesaid notice of publication and that all allegations in the foregoing statement as to time, place and character of publication are true.

Rebecca Weaver

Credit, A/R, A/P Mgr., The Express-Times

Sworn to and subscribed before me this 9th day of August 2005.

Elaine Kehler

Elaine Kehler, Notary Public

My Commission Expires

State of Advertising Costs

Mid-Atlantic Newspapers for PP & L
3899 N. Front St.
Harrisburg, PA 17110

To The Express-Times, Dr.

For Publishing the notice of advertisement attached hereto on the above stated dates-

| | |
|---------------------|------------------|
| | \$ 1120.00 Gross |
| Service charge..... | \$ 0.00 |
| Total..... | \$ 1120.00 Gross |

Publisher's Receipt for Advertising Costs

The Express-Times, a daily newspaper, hereby acknowledges receipt of the aforesaid advertising and publication costs, and certifies that the same have been fully paid.

The Express-Times, a Daily Newspaper
30 No. 4th St., Easton, PA Established 1855 Dial (610) 258-7171

By _____

COMMONWEALTH OF PENNSYLVANIA

Notarial Seal

Elaine L. Kehler, Notary Public

City Of Easton, Northampton County

My Commission Expires July 18, 2009

Member, Pennsylvania Association of Notaries

No. _____ Term, 20____

_____ Court of
Northampton County, Pennsylvania

.....
.....
.....

The Express-Times
Proof of Publication
and
Receipt for Advertising Costs
of

.....
.....

Filed _____, 20.....

Attorney for
Form 111B

Many callers, however, are unwilling to testify in front of a district judge

Also Monday, Councilman Mario Saveri responded to a letter from

Saveri said Bangor will support the project

PLAN

Continued from B-1

venting development in environmentally sensitive areas and allowing denser development where public utilities are available.

Another goal of the plan is to protect individual municipalities from curative amendments. Courts have said developers cannot challenge a community's zoning law as excluding a particular use as long as another community in the plan allows it.

Participating in the process would cost Stockertown less time and money than updating its own comprehensive plan, Matthews said.

The current version "is dated something like 1962," Soloe said.

Matthews said the borough should ensure the proposed land-use plan is consistent with its existing land uses, zoning laws and goals.

"I would think that open-space, farmland is as important to the borough of Stockertown as it is to the townships," he said, pointing out that flood plains and steep slopes should be earmarked for environmental protection.

Borough council and planning commission members will meet again at 7:30 p.m. Sept. 12 to study the plan more closely.

Officials said they are disappointed Forks and Palmer townships are

not players in the metaphorical power game.

The fast-growing neighbors to the south "will have, do have, will continue to have a major impact on the borough," Matthews said.

In townships, such as Upper Nazareth, Bushkill and Moore, officials are wrestling with how to preserve open space without devaluing people's property. The plan recommends implementing restrictive agricultural zoning on 62 percent of the undeveloped land in the CO communities.

Municipal officials are gathering feedback from the public before deciding whether to implement the plan.

MESSINA

Continued from B-1

important in life and loving it, as well as holding onto a happy-go-lucky attitude when times are tough.

"I'm Alright," an old favorite from her second album of the same name, followed by "That's The Way" from the album "Burn" turned the crowd into a choir during the hooks.

Palmer woman injured in crash along Route 611

From staff reports

U. MT. BETHEL TWP. — A Palmer Township woman was seriously injured after her car crashed into a utility pole Monday on Route 611, Pennsylvania State Police at Belfast reported.

Catherine Morrow, 65, of Greenwood Avenue, Palmer Township, was driving north on Route 611 about 5:30 p.m. Monday when her car left the road. Her 2003 Toyota Avalon struck a utility pole, a drainage ditch, a mailbox and a tree, police reported.

Morrow was flown by PennStar helicopter to St. Luke's Hospital in Fountain Hill where a hospital official said she was in serious condition Monday night.

In addition to state police, Medic 9 and fire and ambulance crews from Upper Mount Bethel Township and Portland responded to the crash.

PUBLIC NOTICE

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Proof of Publication Notice in The Morning Call

Under Act No. 587, Approved May 16, 1929, and its amendments

STATE OF PENNSYLVANIA }
COUNTY OF LEHIGH

SS:

COPY OF NOTICE OR ADVERTISEMENT

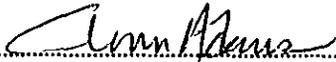
Glenn Adams, Credit Manager of THE

MORNING CALL, INC., of the County and State aforesaid, being duly sworn, deposes and says that THE MORNING CALL is a newspaper of general circulation as defined by the aforesaid Act, whose place of business is 101 North Sixth Street, City of Allentown, County and State aforesaid, and that the said newspaper was established in 1888 since which date THE MORNING CALL has been regularly issued in said County, and that the printed notice or advertisement attached hereto is exactly the same as was printed and published in regular editions and issues of the said THE MORNING CALL, on the following dates, viz:

August 2nd

and the 9th day of August 2005

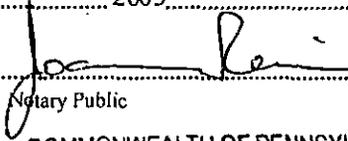
Affiant further deposes that he is the designated agent duly authorized by THE MORNING CALL, INC., a corporation, publisher of said THE MORNING CALL, a newspaper of general circulation, to verify the foregoing statement under oath, and the affiant is not interested in the subject matter of the aforesaid notice or advertisement, and that all allegations in the foregoing statements as to time, place and character of publication are true.



Designated Agent, THE MORNING CALL, INC.

SWORN to and subscribed before me this 9th day of

August 2005


Notary Public

COMMONWEALTH OF PENNSYLVANIA

Notarial Seal
Joanne Reiss, Notary Public
City Of Allentown, Lehigh County
My Commission Expires Nov. 22, 2007

Member, Pennsylvania Association Of Notaries

THE MORNING CALL, INC., publisher of THE MORNING CALL, a newspaper aforesaid notice and publication costs and certifies that the same have been duly paid

PUBLIC NOTICE

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CORRECTIONS

☑ The contemporary Native American musical group Spirit Wing will perform 1:30-3 p.m. today at Liederplatz and 4:30-6 p.m. at Banana Island. An incorrect date for the performances was listed Sunday.

LOTTERIES

MONDAY, AUGUST 8, 2005

PENNSYLVANIA

| | |
|---------------------------|-----------------|
| Daily Number Day | 7-3-8 |
| Daily Number Night | 7-7-8 |
| Big Four Day | 4-7-7-5 |
| Big Four Night | 2-7-3-6 |
| Lucky for Life | 3-5-17-21-24-36 |
| Cash 5 | 3-8-10-21-30 |

NEW JERSEY

| | |
|---------------|----------------------------|
| Pick-3 | early 6-9-4 late 6-8-6 |
| Pick-4 | early 6-6-7-0 late 8-2-7-8 |
| Cash-5 | 8-14-19-29-39 |
| Pick-6 | 16-26-32-33-35-40 |

Note: Results are unofficial.

THREE CASH 5 PLAYERS WIN \$66,667 EACH

HARRISBURG | Three players matched all five winning numbers drawn in Monday's Pennsylvania Cash 5 game and will each receive \$66,667.

Lottery officials said 257 players matched four numbers and won \$198 each; 7,057 players matched three numbers and won \$7.50 each; and 68,222 players matched two numbers and won \$1 each. (AP)

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COLLEGE M
CHAOS. CONFUSION.
WHY NOT PUT IT OF

SCHOOLS closing achievement gaps, but problems re

By Dan Nephin

Of The Associated Press

PITTSBURGH | Schools are narrowing achievement gaps in reading and math, but problems still remain as student performance has fallen or changed little in nearly one-third of Pennsylvania's school districts and the gap remains large for black and Hispanic students, an education group found.

The Education Law Center, a nonprofit legal advocacy group based in Philadelphia, defines "achievement gap" as the "difference between desired and actual student achievement" and used the Pennsylvania System of School Assessment test data for a report issued Monday.

The test, which became mandatory in 1995, has become an important element of Pennsylvania's compliance with federal education mandates that require all students to be at least proficient in math and reading by 2014.

The statewide average has improved by about 10 percent since 2001-02 in reading and math. The report looked at 2003-04 data, the most recent available.

Still, in 162 of the state's 501 districts, or 32 percent, a majority of students failed either the math, reading or both PSSA tests, the center found.

Bethany Yenner, a spokeswoman for Department of Education, said the department hadn't read the reports in detail.

"However, we acknowledge that we still have a lot of work ahead of us in closing the achievement gap," Yenner said.

In reading, the statewide average shows 64 percent of students are proficient or advanced and 36 percent are not proficient. In math, the statewide average shows 56 percent of students are proficient or advanced and 44 per-

cent are not proficient.

When broken down, 37 percent of white, 75 percent of black, 71 percent of Hispanic, 25 percent of Asian, 66 percent of low income, 83 percent of special education and 70 percent of students learning English were not proficient in math.

In reading, 29 percent of whites, 65 percent of blacks, 65 percent of Hispanics, 30 percent of Asians, 59 percent of low income, 80 percent of special education and 80 percent of students learning English were not proficient.

But blacks who achieved proficient or advanced scores

increased by 45 percent in math and 45 percent from 2002 to 2004.

Hispanics increased scores by 20 percent in math and 19 percent in reading. Special education low income students learning English had large increases in rates.

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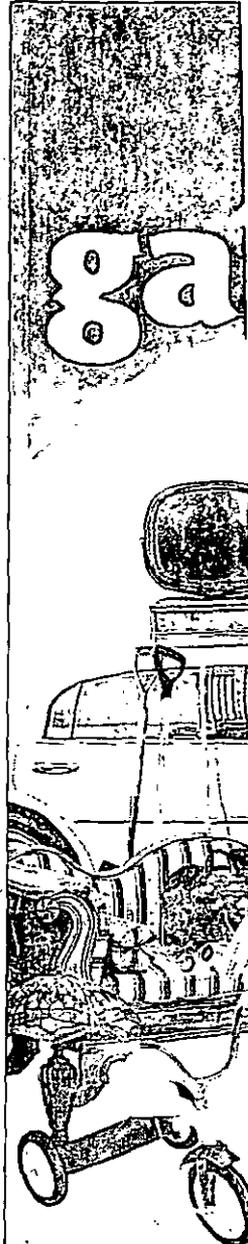
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