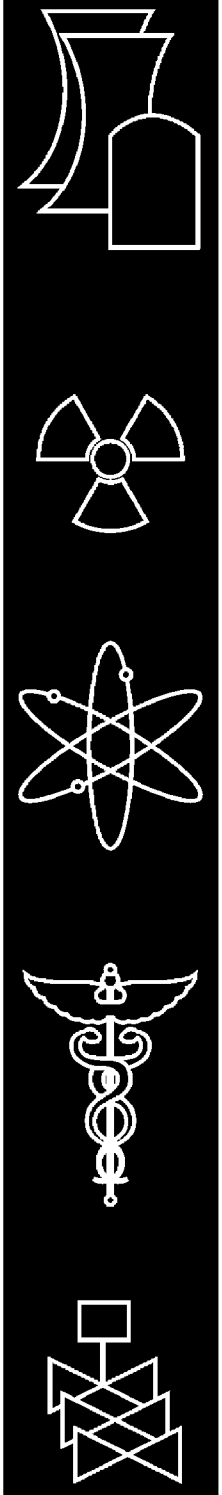
NUREG-1437
Supplement 10



Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 10

Regarding
Peach Bottom Atomic Power Station, Units 2 and 3

Final Report

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555-0001

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Supplement 10

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

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Regarding
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Final Report

Manuscript Completed: January 2003
Date Published: January 2003

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Abstract

The U.S. Nuclear Regulatory Commission (NRC) considered the environmental impacts of renewing nuclear power plant operating licenses (OLs) for a 20-year period in its Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, Volumes 1 and 2, and codified the results in 10 CFR Part 51. The GEIS (and its Addendum 1) identifies 92 environmental issues and reaches generic conclusions related to environmental impacts for 69 of these issues that apply to all plants or to plants with specific design or site characteristics. Additional plant-specific review is required for the remaining 23 issues. These plant-specific reviews are to be included in a supplement to the GEIS.

This Supplemental Environmental Impact Statement (SEIS) has been prepared in response to an application submitted to the NRC by the Exelon Generation Company, LLC (Exelon) to renew the OLs for Peach Bottom Units 2 and 3 for an additional 20 years under 10 CFR Part 54. This SEIS includes the NRC staff's analysis in which the staff considers and weighs the environmental impacts of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse impacts. It also includes the staff's recommendation regarding the proposed action and responses to comments received on Draft Supplement 10 to the GEIS.

Neither Exelon nor the staff has identified information that is both new and significant for any of the issues for which the GEIS reached generic conclusions. In addition, the staff determined that information provided during the scoping process did not call into question the conclusions in the GEIS. Therefore, the staff concludes that the impacts of renewing the Peach Bottom Units 2 and 3 OLs will not be greater than impacts identified for these issues in the GEIS. For each of these issues, the GEIS conclusion is that the impact is of SMALL[(a)] significance (except for collective offsite radiological impacts from the fuel cycle and high-level waste and spent fuel, which were not assigned a single significance level).

Each of the remaining 23 issues potentially applies to Peach Bottom Units 2 and 3 and each is addressed in this SEIS. For each applicable issue, the staff concludes that the significance of the potential environmental impacts of renewal of the OLs is SMALL. The staff also concludes that additional mitigation measures are not likely to be sufficiently beneficial as to be warranted. The staff determined that information provided during the scoping process did not identify any new issue that has a significant environmental impact.

(a) Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

Abstract

The NRC staff recommends that the Commission determine that the adverse environmental impacts of license renewal for Peach Bottom Units 2 and 3 are not so great that preserving the option of license renewal for energy-planning decision makers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2) the Environmental Report submitted by Exelon; (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review, and (5) the staff's consideration of public comments.

Contents

Figures

Tables

Executive Summary

By letter dated July 2, 2001, the Exelon Generation Company, LLC (Exelon) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for Peach Bottom Units 2 and 3 for an additional 20-year period. If the OLs are renewed, State regulatory agencies and Exelon will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, then the plant must be shut down at or before the expiration dates of the current OLs, which are August 8, 2013, for Unit 2, and July 2, 2014, for Unit 3.

Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4332), directs that an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, Subpart A. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2.[(a)]

Upon acceptance of the Exelon application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping. The staff visited the Peach Bottom site in November 2001 and held public scoping meetings on November 7, 2001, in Delta, Pennsylvania. The staff reviewed the Exelon Environmental Report (ER) and compared it to the GEIS; consulted with other agencies; conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*; and considered the public comments received during the scoping process for preparation of the draft Supplemental Environmental Impact Statement (SEIS) for Peach Bottom Units 2 and 3. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part I, of this SEIS.

On July 5, 2002, the U.S. Environmental Protection Agency (EPA) published the Notice of Availability of the draft SEIS (67 FR 44832). A 75-day comment period began on that date, during which members of the public could comment on the preliminary results of the NRC staff's review. The staff held two public meetings in Delta, Pennsylvania, on July 30, 2002, to describe the preliminary results of the NRC environmental review and answer questions to

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

provide members of the public with information to assist them in formulating comments on the draft SEIS. All of the comments received on the draft SEIS were considered by the staff in developing the final document and are presented in Appendix A, Part II.

This SEIS includes the NRC staff's analysis in which the staff considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures for reducing or avoiding adverse effects. It also includes the staff's preliminary recommendation regarding the proposed action.

The Commission has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

> ... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OL.

NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) ["Temporary storage of spent fuel after cessation of reactor

> operation–generic determination of no significant environmental impact"] and in accordance with § 51.23(b).

The GEIS contains the results of a systematic evaluation of the consequences of renewing an OL and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

> SMALL - Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
>
> LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS led to the following conclusions:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated as Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized.

Environmental justice was not evaluated on a generic basis and must be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the OLs for Peach Bottom Units 2 and 3) and alternative methods of power generation. Based on projections made by the U.S. Department of Energy's (DOE's) Energy Information Administration (EIA), gas- and coal-fired generation appear to be the most likely power-generation alternatives if the power from Units 2 and 3 is replaced. These alternatives are evaluated assuming that the replacement power generation plant is located at either the Peach Bottom site or some other unspecified alternate location in Pennsylvania.

Exelon and the staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither Exelon nor the staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither Exelon nor the staff has identified any new issue applicable to Peach Bottom Units 2 and 3 that has a significant environmental impact. These determinations include the consideration of public comments. Therefore, the staff relies upon the conclusions of the GEIS for all of the Category 1 issues that are applicable to Peach Bottom Units 2 and 3.

Exelon's license renewal application presents an analysis of the Category 2 issues that are applicable to Peach Bottom Units 2 and 3 plus environmental justice and chronic effects from electromagnetic fields. The staff has reviewed the Exelon analysis for each issue and has conducted an independent review of each issue. Three Category 2 issues are not applicable, because they are related to plant design features or site characteristics not found at Peach Bottom. Four Category 2 issues are not discussed in this SEIS, because they are specifically related to refurbishment. Exelon has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of Peach Bottom Units 2 and 3 for the license renewal period. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant component replacement, and therefore, are not expected to affect the environment outside of the bounds of the plant operations evaluated in the U.S. Atomic Energy Commission's 1972 Final Environmental Statement Related to Operation of Peach Bottom Plant.

Fourteen Category 2 issues related to operational impacts and postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this SEIS. Five of the Category 2 issues and environmental justice apply

to both refurbishment and to operation during the renewal term and are only discussed in this draft SEIS in relation to operation during the renewal term. For all 14 Category 2 issues and environmental justice, the staff concludes that the potential environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs. Based on its review of the SAMAs for Peach Bottom Units 2 and 3, and the plant improvements already made, the staff concludes that none of the candidate SAMAs are cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate the environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted.

If the Peach Bottom OLs are not renewed and the units cease operation on or before the expiration of their current OLs, then the adverse impacts of likely alternatives will not be smaller than those associated with continued operation of Peach Bottom Units 2 and 3. The impacts may, in fact, be greater in some areas.

The recommendation of the NRC staff is that the Commission determine that the adverse environmental impacts of license renewal for Peach Bottom Units 2 and 3 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS; (2) the ER submitted by Exelon; (3) consultation with other Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments.

Abbreviations/Acronyms

◦	degree
μCi	microcurie(s)
μCi/mL	microcurie(s) per milliliter
μGy	microgray(s)
μm	micrometer(s)
μSv	microsieverts
ABWR	advanced boiling water reactor
ac	acre(s)
ACC	averted cleanup and decontamination cost
ACS	American Cancer Society
AEA	Atomic Energy Act of 1954
AEC	U.S. Atomic Energy Commission
AOC	averted offsite property damage costs
AOE	averted occupational exposure
AOSC	averted onsite costs
APB	accident progression bin
APE	averted public exposure
AQCR	air quality control region
ATWS	anticipated transient without scram
BEIR	Biological Effects of Ionizing Radiation
Bq	becquerel(s)
Bq/mL	becquerel(s) per milliliter
Btu	British thermal unit(s)
BWR	boiling water reactor
BWROG	boiling water reactor owners group
C	Celsius
CAA	Clean Air Act
CC/MS	cooler condenser/moisture separator
CDF	core damage frequency
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Ci	curie(s)
cm	centimeter(s)
CS	containment spray
CWA	Clean Water Act

DAW	dry active waste
DBA	design-basis accident
dc	direct current
DOE	U.S. Department of Energy
DPR	demonstration project reactor
DSHPO	Delaware State Historic Preservation Officer
DSM	demand-side management
EIA	Energy Information Administration (of DOE)
EIS	environmental impact statement
ELF-EMF	extremely low frequency-electromagnetic field
EOP	Emergency Operating Procedures
EPA	U.S. Environmental Protection Agency
EPG	Emergency Procedure Guidelines
EPRI	Electric Power Research Institute
EP/SAG	Emergency Procedure and Severe Accident Guidelines
ER	Environmental Report
ESA	Endangered Species Act
ESRP	Environmental Standard Review Plan, NUREG-1555, Supplement 1, Operating License Renewal
F	Fahrenheit
FES	Final Environmental Statement
FPS	Fire Protection System
FR	Federal Register
FSAR	Final Safety Analysis Report
ft	foot/feet
ft/s	feet per second
FWPCA	Federal Water Pollution Control Act (also known as the Clean Water Act of 1977)
FWS	U.S. Fish and Wildlife Service
gal	gallon(s)
GEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437
gpd	gallon(s) per day
gpm	gallon(s) per minute
GWH	gigawatt-hour(s)
Gy	gray
ha	hectare(s)
HEPA	high-efficiency particulate air (filter)
HIC	High integrity container

HLW	high-level waste
HPCI	high pressure coolant injection
HPSW	High Pressure Service Water
hr	hour(s)
Hz	Hertz
ICRP	International Commission on Radiological Protection
in.	inch(es)
INEEL	Idaho National Engineering and Environmental Laboratory
IPEEE	individual plant examination of external events
ISFSI	independent spent fuel storage installation
ISLOCA	interfacing system loss-of-coolant accident
J	joule
kg	kilogram(s)
km	kilometer(s)
kV	kilovolt(s)
kV/m	kilovolt(s) per meter
kWh	kilowatt hour(s)
L	liter(s)
lb	pound(s)
LNT	linear, nonthreshold
LOCA	loss-of-coolant accident
LOOP	loss of offsite power
LQ	linear-quadratic
m	meter(s)
m/s	meter(s) per second
m^3/d	cubic meters per day
m^3/s	cubic meter(s) per second
mA	milliampere(s)
MACCS	MELCOR Accident Consequence Code System
MDD	maximum daily demand
MDE	Maryland Department of the Environment
mGy	milligray(s)
MHT	Maryland Historical Trust
mi	mile(s)
min	minute(s)
mL	milliliter(s)
mph	mile(s) per hour

mrad	millirad(s)
mrem	millirem(s)
mSv	millisievert(s)
MT	metric ton(s) (or tonne[s])
MTHM	metric ton(s) (or tonne[s]) of heavy metal
MTU	metric ton(s) (or tonne[s])-uranium
MW	megawatt(s)
MWd/MTU	megawatt-day(s) per metric ton (or tonne) of uranium
MW(e)	megawatt(s) electric
MW(t)	megawatt(s) thermal
MWh	megawatt hour(s)
NA	not applicable
NAS	National Academy of Sciences
NCI	National Cancer Institute
NCRP	National Council on Radiation Protection and Measurements
NEPA	National Environmental Policy Act of 1969
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service
NO_x	nitrogen oxide(s)
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NREL	National Renewable Energy Laboratory
NSW	Normal Service Water
ODCM	Offsite Dose Calculation Manual
OL	operating license
PARs	Publically Available Record
PBq	petabecquerel(s)
PDEP	Pennsylvania Department of Environmental Protection
PDS	plant damage state
PECO	Philadelphia Energy Company (predecessor to Exelon)
PHMC	Pennsylvania Historic and Museum Commission
PSHPO	Pennsylvania State Historic Preservation Officer
PM_{10}	particulate matter, 10 microns or less in diameter
PSA	probabilistic safety analysis; prostate-specific antigen
PSD	prevention of significant deterioration
psig	pounds per square inch above atmospheric pressure
PURTA	Pennsylvania Utility Realty Tax Act
PWR	pressurized water reactor

RAI	request for additional information
RCIC	reactor core isolation cooling
RCP	reactor coolant pump
rem	special unit of dose equivalent, equal to 0.01 Sv
REMP	radiological environmental monitoring program
RHR	residual heat removal
rms	root mean square
RPHP	Radiation and Public Health Project
RWCU	Reactor Water Cleanup
s	second(s)
SAFSTOR	safe storage (a plant status option during decommissioning)
SAMA	severe accident mitigation alternative
SAR	Safety Analysis Report
SBO	station blackout
SEIS	supplemental environmental impact statement
SER	Safety Evaluation Report
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SO_x	sulfur oxide(s)
SRBC	Susquehanna River Basin Commission
Sv	Sievert, special unit of dose equivalent
TBq	terabecquerel(s)
UDB	urban development boundary
UFSAR	Updated Final Safety Analysis Report
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPS	Uninterruptible Power Supply
U.S.	United States
USCB	U.S. Census Bureau
USC	United States Code
USDA	U.S. Department of Agriculture
w	watt, 1 J/s
yr	year(s)

1.0 Introduction

Under the Nuclear Regulatory Commission's (NRC's) environmental protection regulations in Title 10 of the Code of Federal Regulations (CFR) Part 51, which implement the National Environmental Policy Act (NEPA), renewal of a nuclear power plant operating license (OL) requires the preparation of an environmental impact statement (EIS). In preparing the EIS, the NRC staff is required first to issue the statement in draft form for public comment, and then issue a final statement after considering public comments on the draft. To support the preparation of the EIS, the staff has prepared a *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999)[(a)]. The GEIS is intended to (1) provide an understanding of the types and severity of environmental impacts that may occur as a result of license renewal of nuclear power plants under 10 CFR Part 54, (2) identify and assess the impacts that are expected to be generic to license renewal, and (3) support 10 CFR Part 51 to define the number and scope of issues that need to be addressed by the applicants in plant-by-plant renewal proceedings. Use of the GEIS guides the preparation of complete plant-specific information in support of the OL renewal process.

The Exelon Generation Company, LLC (Exelon, formerly Philadelphia Electric Company or PECO) operates Peach Bottom nuclear reactor Units 2 and 3 in Pennsylvania under OLs DPR-44 and DPR-56, which were issued by the NRC. These OLs will expire in August 2013 for Unit 2 and July 2014 for Unit 3. On July 2, 2001, Exelon submitted an application to the NRC to renew the Peach Bottom Units 2 and 3 OLs for an additional 20 years under 10 CFR Part 54. Exelon is a *licensee* for the purposes of its current OLs and an *applicant* for the renewal of the OLs. Pursuant to 10 CFR 54.23 and 51.53(c), Exelon submitted an Environmental Report (ER; Exelon 2001a) in which Exelon analyzed the environmental impacts associated with the proposed license renewal action, considered alternatives to the proposed action, and evaluated mitigation measures for reducing adverse environmental effects.

This report is the draft plant-specific supplement to the GEIS (the supplemental EIS [SEIS]) for the Exelon license renewal application. This SEIS is a supplement to the GEIS because it relies, in part, on the findings of the GEIS. The staff will also prepare a separate safety evaluation report in accordance with 10 CFR Part 54.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

1.1 Report Contents

The following sections of this introduction (1) describe the background for the preparation of this SEIS, including the development of the GEIS and the process used by the staff to assess the environmental impacts associated with license renewal, (2) describe the proposed Federal action to renew the Peach Bottom Units 2 and 3 OLs, (3) discuss the purpose and need for the proposed action, and (4) present the status of Exelon's compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies that are responsible for environmental protection.

The ensuing chapters of this SEIS closely parallel the contents and organization of the GEIS. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 and 4, respectively, discuss the potential environmental impacts of plant refurbishment and plant operation during the renewal term. Chapter 5 contains an evaluation of potential environmental impacts of plant accidents and includes consideration of severe accident mitigation alternatives. Chapter 6 discusses the uranium fuel cycle and solid waste management. Chapter 7 discusses decommissioning, and Chapter 8 discusses alternatives to license renewal. Finally, Chapter 9 summarizes the findings of the preceding chapters and draws conclusions about the adverse impacts that cannot be avoided (the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and the irreversible or irretrievable commitment of resources). The final chapter also presents the staff's preliminary recommendation with respect to the proposed license renewal action.

Additional information is included in appendixes. Appendix A contains public comments received on the environmental review for license renewal and staff responses. Appendices B through F, respectively, list the following:

- the contributors to the supplement
- the chronology of NRC staff environmental review correspondence related to this SEIS
- the organizations contacted during the development of this SEIS
- Exelon's compliance status in Table E-1
- GEIS environmental issues that are not applicable to Peach Bottom Units 2 and 3.

1.2 Background

Use of the GEIS, which examines the possible environmental impacts that could occur as a result of renewing individual nuclear power plant OLs under 10 CFR Part 54, and the established license renewal evaluation process supports the thorough evaluation of the impacts of renewal of OLs.

1.2.1 Generic Environmental Impact Statement

The NRC initiated a generic assessment of the environmental impacts associated with the license renewal term to improve the efficiency of the license renewal process by documenting the assessment results and codifying the results in the Commission's regulations. This assessment is provided in the GEIS, which serves as the principal reference for all nuclear power plant license renewal EISs.

The GEIS documents the results of the systematic approach that was taken to evaluate the environmental consequences of renewing the licenses of individual nuclear power plants and operating them for an additional 20 years. For each potential environmental issue, the GEIS (1) describes the activity that affects the environment, (2) identifies the population or resource that is affected, (3) assesses the nature and magnitude of the impact on the affected population or resource, (4) characterizes the significance of the effect for both beneficial and adverse effects, (5) determines whether the results of the analysis apply to all plants, and (6) considers whether additional mitigation measures would be warranted for impacts that would have the same significance level for all plants.

The NRC's standard of significance was established using the Council on Environmental Quality (CEQ) terminology for "significantly" (40 CFR 1508.27, which requires consideration of both "context" and "intensity"). Using the CEQ terminology, the NRC established three significance levels–SMALL, MODERATE, or LARGE. The definitions of the three significance levels are set forth in the footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, as follows:

SMALL - Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The GEIS assigns a significance level to each environmental issue, assuming that ongoing mitigation measures would continue.

The GEIS includes a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required in this SEIS unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

In the GEIS, the staff assessed 92 environmental issues and determined that 69 qualified as Category 1 issues, 21 qualified as Category 2 issues, and 2 issues were not categorized. The latter 2 issues, environmental justice and chronic effects of electromagnetic fields, are to be addressed in a plant-specific analysis. Of the 92 issues, 11 are related only to refurbishment, 6 are related only to decommissioning, 67 apply only to operation during the renewal term, and 8 apply to both refurbishment and operation during the renewal term. A summary of the findings for all 92 issues in the GEIS is codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

1.2.2 License Renewal Evaluation Process

An applicant seeking to renew its OLs is required to submit an ER as part of its application. The license renewal evaluation process involves careful review of the applicant's ER and assurance that all new and potentially significant information not already addressed in or

available during the GEIS evaluation is identified, reviewed, and assessed to verify the environmental impacts of the proposed license renewal.

In accordance with 10 CFR 51.53(c)(2) and (3), the ER submitted by the applicant must

- provide an analysis of the Category 2 issues in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B in accordance with 10 CFR 51.53(c)(3)(ii)

- discuss actions to mitigate any adverse impacts associated with the proposed action and environmental impacts of alternatives to the proposed action.

In accordance with 10 CFR 51.53(c)(2), the ER does not need to

- consider the economic benefits and costs of the proposed action and alternatives to the proposed action except insofar as such benefits and costs are either (1) essential for making a determination regarding the inclusion of an alternative in the range of alternatives considered, or (2) relevant to mitigation

- consider the need for power and other issues not related to the environmental effects of the proposed action and the alternatives

- discuss any aspect of the storage of spent fuel within the scope of the generic determination in 10 CFR 51.23(a) in accordance with 10 CFR 51.23(b)

- contain an analysis of any Category 1 issue unless there is significant new information on a specific issue—this is pursuant to 10 CFR 51.23(c)(3)(iii) and (iv).

New and significant information is (1) information that identifies a significant environmental issue not covered in the GEIS and codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, or (2) information that was not considered in the analyses summarized in the GEIS and that leads to an impact finding that is different from the finding presented in the GEIS and codified in 10 CFR Part 51.

In preparing to submit its application to renew the Peach Bottom Units 2 and 3 OLs, Exelon developed a process to ensure that information not addressed in or available during the GEIS evaluation regarding the environmental impacts of license renewal for Peach Bottom Units 2 and 3 would be properly reviewed before submitting the ER, and to ensure that such new and potentially significant information related to renewal of the licenses for Units 2 and 3 would be identified, reviewed, and assessed during the period of NRC review. Exelon reviewed the Category 1 issues that appear in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, to verify that the conclusions of the GEIS remained valid with respect to Peach Bottom Units 2 and 3.

This review was performed by personnel from Exelon and its support organization who were familiar with NEPA issues and the scientific disciplines involved in the preparation of a license renewal ER.

The NRC staff also has a process for identifying new and significant information. That process is described in detail in *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (ESRP), NUREG-1555, Supplement 1 (NRC 2000). The search for new information includes (1) review of an applicant's ER and the process for discovering and evaluating the significance of new information; (2) review of records of public comments; (3) review of environmental quality standards and regulations; (4) coordination with Federal, State, and local environmental protection and resource agencies; and (5) review of the technical literature. New information discovered by the staff is evaluated for significance using the criteria set forth in the GEIS. For Category 1 issues where new and significant information is identified, reconsideration of the conclusions for those issues is limited in scope to the assessment of the relevant new and significant information; the scope of the assessment does not include other facets of the issue that are not affected by the new information.

Chapters 3 through 7 discuss the environmental issues considered in the GEIS that are applicable to Peach Bottom Units 2 and 3. At the beginning of the discussion of each set of issues, there is a table that identifies the issues to be addressed and lists the sections in the GEIS where the issue is discussed. Category 1 and Category 2 issues are listed in separate tables. For Category 1 issues for which there is no new and significant information, the table is followed by a set of short paragraphs that state the GEIS conclusion codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, followed by the staff's analysis and conclusion. For Category 2 issues, in addition to the list of GEIS sections where the issue is discussed, the tables list the subparagraph of 10 CFR 51.53(c)(3)(ii) that describes the analysis required and the SEIS sections where the analysis is presented. The SEIS sections that discuss the Category 2 issues are presented immediately following the table.

The NRC prepares an independent analysis of the environmental impacts of license renewal and compares these impacts with the environmental impacts of alternatives. The evaluation of the Exelon license renewal application began with publication of a notice of acceptance for docketing and opportunity for a hearing in the Federal Register (FR; 66 FR 46036 [NRC 2001a]) on August 31, 2001. The staff published a notice of intent to prepare an EIS and conduct scoping (66 FR 48892 [NRC 2001b]) on September 24, 2001. Two public scoping meetings were held on November 7, 2001, in Delta, Pennsylvania. Comments received during the scoping period were summarized in the Peach Bottom License Renewal Environmental Scoping Summary Report, dated April 19, 2002. Comments that are applicable to this environmental review are presented in Part I of Appendix A.

The staff followed the review guidance contained in NUREG-1555, Supplement 1, in the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff and its contractors visited the Peach Bottom site on November 7 and 8, 2001, to gather information and to become familiar with the site and its environs. The staff also reviewed the comments received during scoping, and consulted with Federal, State, regional, and local agencies. A list of the organizations consulted is provided in Appendix D. Other documents related to Peach Bottom Units 2 and 3 were reviewed and are referenced.

On July 5, 2002, the U.S. Environmental Protection Agency published the Notice of Availability of the draft SEIS (67 FR 44832, EPA 2002). A 75-day comment period began on that date during which members of the public could comment on the preliminary results of the NRC staff's review. During this comment period, two public meetings were held in Delta, Pennsylvania on July 30, 2002. During these meetings, the staff described the preliminary results of the NRC environmental review and answered questions related to it to provide members of the public with information to assist them in formulating their comments. The comment period for the Peach Bottom Units 2 and 3 draft SEIS ended September 17, 2002. Comments made during the 75 day comment period, including those made at the two public meetings, are presented in Part 2 of Appendix A. The NRC responses to these comments are also provided.

This SEIS presents the staff's analysis in which the staff considers and weighs the environmental effects of the proposed renewal of the OL for Peach Bottom Units 2 and 3, the environmental impacts of alternatives to license renewal, and mitigation measures available for avoiding adverse environmental effects. Chapter 9, "Summary and Conclusions," provides the NRC staff's recommendation to the Commission on whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy-planning decision-makers would be unreasonable.

1.3 The Proposed Federal Action

The proposed Federal action is renewal of the OLs for Peach Bottom Units 2 and 3 (Peach Bottom Unit 1 has been shut down since 1974. The decommissioning of Unit 1 is outside the scope of this SEIS). The Peach Bottom site is located in southern Pennsylvania, on the banks of the Susquehanna River, approximately 31 km (19 mi) south of Lancaster, Pennsylvania, 48 km (30 mi) southeast of York, Pennsylvania, and 61 km (38 mi) north of Baltimore, Maryland. The plant has two General Electric-designed light-water reactors, each with a design rating for a net power output of 1093 megawatts electric (MW[e]). Plant cooling is provided by a once-through heat dissipation system that dissipates heat to the environment. Units 2 and 3 produce electricity to supply the needs of approximately 35% of Exelon's 1.5 million business

and residential customers in its mid-atlantic service area. The current OL for Unit 2 expires on August 8, 2013, and for Unit 3 on July 2, 2014. By letter dated July 2, 2001, Exelon submitted an application to the NRC (Exelon 2001b) to renew these OLs for an additional 20 years of operation (i.e., until August 8, 2033, for Unit 2 and July 2, 2034, for Unit 3).

1.4 The Purpose and Need for the Proposed Action

Although a licensee must have a renewed license to operate a reactor beyond the term of the existing OL, the possession of that license is just one of a number of conditions that must be met for the licensee to continue plant operation during the term of the renewed license. Once an OL is renewed, State regulatory agencies and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners.

Thus, for license renewal reviews, the NRC has adopted the following definition of purpose and need (GEIS Section 1.3):

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and where authorized, Federal (other than NRC) decisionmakers.

This definition of purpose and need reflects the Commission's recognition that, unless there are findings in the safety review required by the Atomic Energy Act or findings in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC does not have a role in the energy-planning decisions of State regulators and power plant licensees as to whether a particular nuclear power plant should continue to operate. From the perspective of the licensee and the State regulatory authority, the purpose of renewing an OL is to maintain the availability of the nuclear plant to meet system energy requirements beyond the current term of the plant's license.

1.5 Compliance and Consultations

Exelon is required to hold certain Federal, State, and local environmental permits, as well as meet relevant Federal and State statutory requirements. In its ER, Exelon provided a list of the authorizations from Federal, State, and local authorities for current operations as well as environmental approvals and consultations associated with Peach Bottom Units 2 and 3 license renewal. Authorizations and consultations most relevant to the proposed OL renewal action are summarized in Table 1-1. The full list of authorizations and consultations provided by Exelon is

included in Appendix E. The staff has reviewed the list and consulted with the appropriate Federal, State, and local agencies to identify any compliance or permit issues or significant environmental issues of concern to the reviewing agencies. These agencies did not identify any new and significant environmental issues. The ER states that Exelon is in compliance with applicable environmental standards and requirements for Peach Bottom Units 2 and 3. The staff has also not identified any environmental issues that are both new and significant.

Table 1-1. Federal, State, and Local Authorizations and Consultations

Agency	Authority	Requirement	Number	Permit Expiration or Consultation Date	Activity Covered
NRC	Atomic Energy Act, 10 CFR Part 50	Operating license	DPR-44 (Unit 2) DRP-56 (Unit 3)	August 8, 2013 (Unit 2) July 2, 2014 (Unit 3)	Operation of Peach Bottom Units 2 and 3
FWS and NMFS	Endangered Species Act, Section 7	Consultation	NA	Initiated October 11, 2000	Operation during the renewal term
SRBC	Susquehanna Basin Compact (18 CFR 803)	Approval	Docket 19830506	Issued on May 12, 1985, no expiration date	Consumptive use of Conowingo Pond water
PDEP	Storage Tank and Spill Prevention Act 32	Registration	187882	Issued annually	Storage tanks (gasoline, used oil, hazardous substances, unlisted materials)
PDEP	Pennsylvania Statutes. Section 691.1 et seq.	NPDES permit and FWPCA Section 401 certification	PA0009733	December 1, 2005	Permit for discharge of waste waters from cooling water, waste water settling basin, auxiliary boiler blowdown, sewage treatment plant, dredging rehandling basin, raw intake screen backwash water, and storm water outfall.

Table 1-1. (contd)

Agency	Authority	Requirement	Number	Permit Expiration or Consultation Date	Activity Covered
PDEP	Pennsylvania Dam Safety and Encroachment Act (32 P.S. Section 693.1 et seq.), Clean Stream Law (35 P.S. Section 691.1 et seq.), Flood Plan Management Act (32 P.S. Section 679.101 et seq.)	Permit	E36-693	December 31,2010	Maintenance dredging of intake area
PDEP	Pennsylvania Safe Drinking Water Act	Permit	6791502	Issued March 21, 1994, no expiration date	Public Water Supply permit
PDEP	Air Pollution Control Act (25 Pa. Code Chapter 127)	Air emissions permit	67-05020	February 29, 2003	Emissions from diesel emergency generators, miscellaneous diesel engines, and other miscellaneous units
MDE	Coastal Zone Management Act, Section 307	Consistency determination	Draft	Letter from MDE dated January 29, 2001	Consistency of license renewal with the Maryland Coastal Management Program is under review
DSHPO	National Historic Preservation Act, Section 106	Consultation	NA	Letter from DSHPO to NRC dated October 29, 2001	Impact on sites listed or eligible for listing in the National Register of Historic Places
MHT	National Historic Preservation Act, Section 106	Consultation	NA	Letter from MHT to PECO dated September 22, 2000	Impact on sites listed or eligible for listing in the National Register of Historic Places
PSHPO	National Historic Preservation Act, Section 106	Consultation	NA	Letter from PHMC to PECO dated December 14, 2001	Impact on sites listed or eligible for listing in the National Register of Historic Places

DSHPO - Delaware State Historic Preservation Officer.
FWPCA - Federal Water Pollution Control Act (also known as the Clean Water Act).
FWS - U.S. Fish and Wildlife Service.
MDE - Maryland Department of the Environment.
MHT - Maryland Historical Trust.
NA - Not applicable
NMFS - National Marine Fisheries Service.
NPDES - National Pollutant Discharge Elimination System.
PDEP - Pennsylvania Department of Environmental Protection.
PECO - PECO Energy (predecessor to Exelon).
PHMC - Pennsylvania Historic and Museum Commission.
PSHPO - Pennsylvania State Historic Preservation Officer.
SRBC - Susquehanna River Basin Commission.

1.6 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

40 CFR 1508. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 1508, "Terminology and Index."

Atomic Energy Act of 1954 (AEA). 42 USC 2011, et seq.

Endangered Species Act (ESA). 16 USC 1531, et seq.

Federal Water Pollution Control Act. 33 USC 1251, et seq. (Also known as the Clean Water Act [CWA]).

Exelon Generation Company, LLC (Exelon). 2001a. *Applicant's Environmental Report – Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

Exelon Generation Company, LLC (Exelon). 2001b. *Application for Renewed Operating Licenses, Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

National Environmental Policy Act of 1969 (NEPA). 42 USC 4321, et seq.

National Historic Preservation Act of 1966 (NHPA). 16 USC 470, et seq.

U.S. Environmental Protection Agency (EPA). 2002. "Environmental Impact Statements; Notice of Availability." *Federal Register*, Vol. 67, No. 129, p. 44832. July 5, 2002.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants Main Report*, "Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*. NUREG-1555, Supplement 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2001a. "Notice of Acceptance for Docketing of the Application and Notice of Opportunity for a Hearing Regarding Renewal of License Nos. DPR-44 and DPR-56 for an Additional Twenty-Year Period." *Federal Register*: Vol. 66, No. 170, pp. 46036-46038. August 31, 2001.

U.S. Nuclear Regulatory Commission (NRC). 2001b. "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process." *Federal Register*: Vol. 66, No. 185, pp. 48892-48893. September 24, 2001.

U.S. Nuclear Regulatory Commission (NRC). 2002. Peach Bottom License Renewal Environmental Scoping Summary Report, April 19, 2002.

2.0 Description of Nuclear Power Plant and Site and Plant Interaction with the Environment

The Exelon Generation Company's (Exelon's) Peach Bottom Atomic Power Station is located on the bank of the Susquehanna River in York County, Pennsylvania. The plant consists of three units. Units 2 and 3 are operating nuclear reactors and the subject of this action. Unit 1 is a permanently shut down and defueled plant maintained in an operating SAFSTOR decommissioning condition (i.e., safe storage; continued surveillance, security, and maintenance) and is not subject to this action. Additional information regarding SAFSTOR and additional decommissioning methods are described in Section 7.2.2 of NUREG-1437 (NRC 1996). Units 2 and 3 are boiling water reactors (BWRs) which produce steam that turns turbines to generate electricity. In addition to the nuclear units, the site features intake and discharge canals, auxiliary buildings, switchyards, an independent spent fuel storage installation (ISFSI), a training center, and a public boat ramp and picnic area. The plant and its environment are described in Section 2.1, and the plant's interaction with the environment is presented in Section 2.2.

2.1 Plant and Site Description and Proposed Plant Operation During the Renewal Term

Peach Bottom Units 2 and 3 are located on approximately 248 ha (620 ac) of Exelon-owned land in York County, Pennsylvania (Exelon 2001a). The plant is located approximately 61 km (38 mi) north of Baltimore, Maryland. Figures 2-1 and 2-2 show the site location and features within 80 km (50 mi) and 10 km (6 mi), respectively. The area immediately behind the site is a rock cliff that rises to an elevation of about 90 m (300 ft). The site has an exclusion area boundary extending approximately 0.82 km (0.51 mi) around the plant (Exelon 2001a, NRC 1996).

The region surrounding the Peach Bottom site was identified in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999)[(a)] as having a low population density. Peach Bottom Units 2 and 3 employ a work force of about 725 permanent employees and about 275 contractor employees. Each unit is refueled on a 24-month cycle, which means one refueling at the site every year. During refueling outages, site employment increases by as many as 800 workers for temporary duty (typically, 30 to 40 days). The nearest city limits are Lancaster, Pennsylvania, approximately 31 km (19 mi) to the north, and York, Pennsylvania, approximately 48 km (30 mi) to the northwest of the site.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

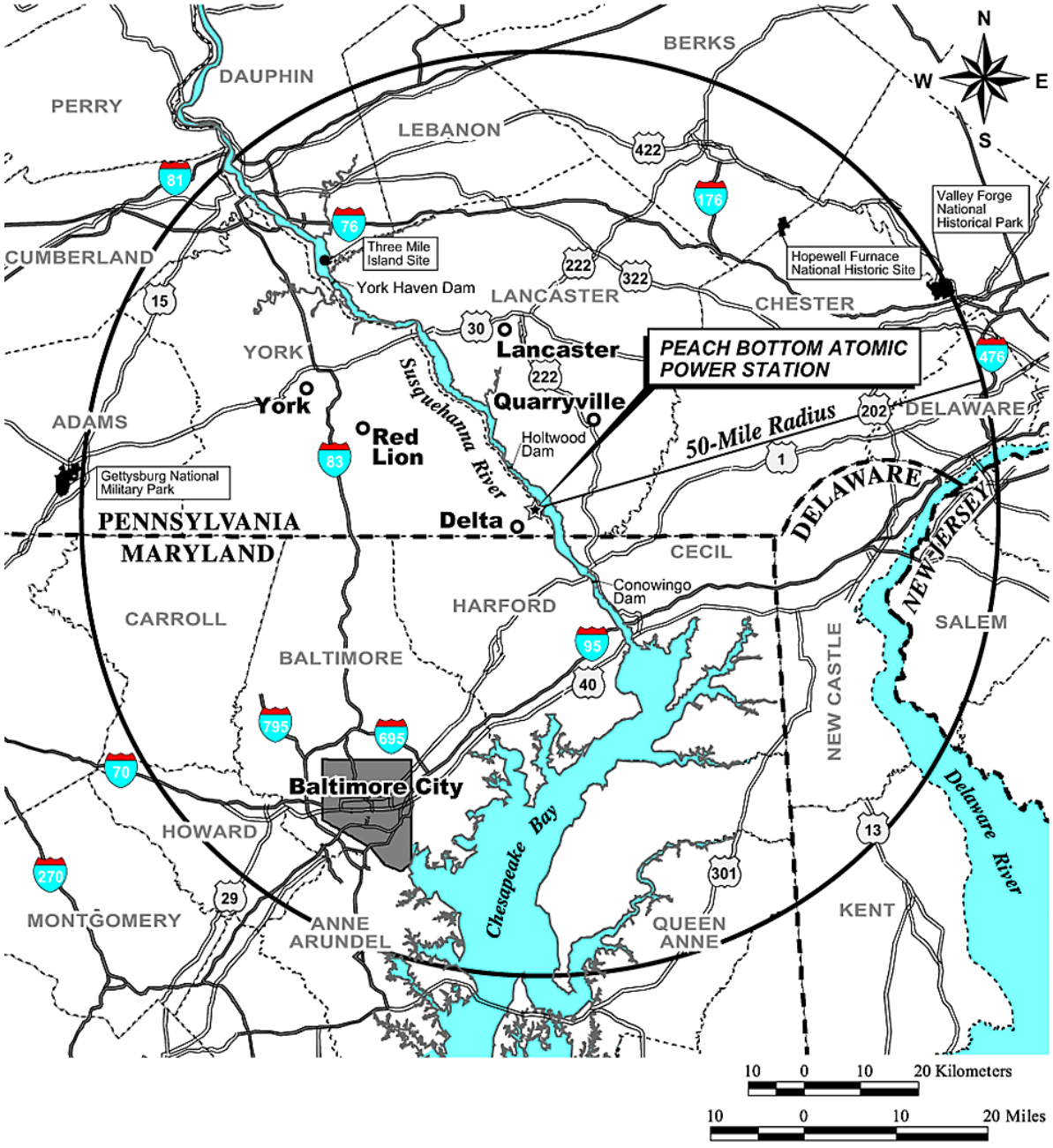

Figure 2-1. Location of Peach Bottom site, 80-km (50-mi) Region

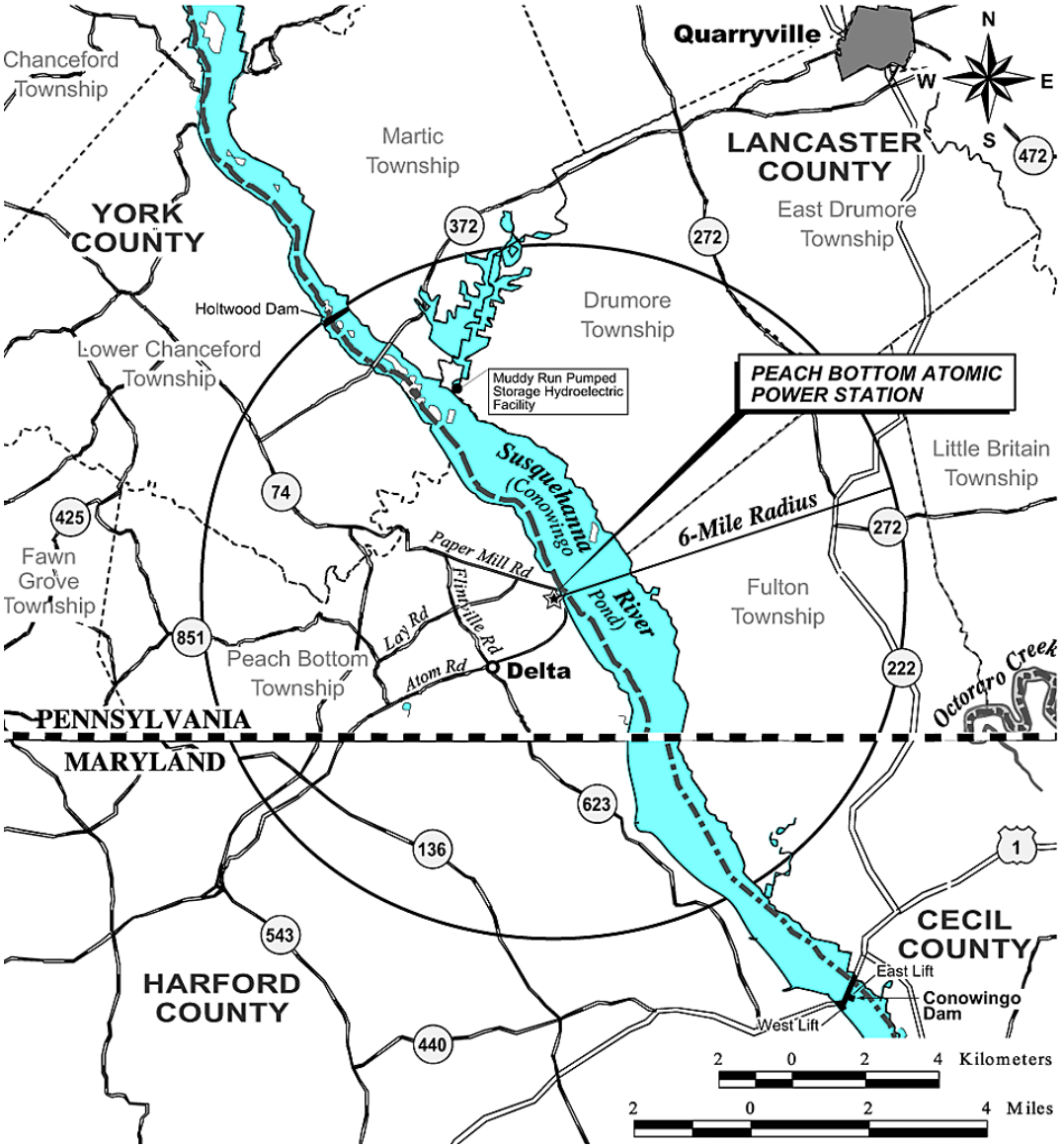

Figure 2-2. Location of Peach Bottom site, 10-km (6-mi) Region

The Peach Bottom site is located on the west side of Conowingo Pond, which was formed when Conowingo Dam was constructed across the Susquehanna River in 1928 (Figure 2-2). The Peach Bottom site is approximately 29 km (18 mi) upstream from the point where the river enters the Chesapeake Bay (Figure 2-1) and 13 km (8 mi) upstream from Conowingo Dam.

In addition to the two operating nuclear reactors and their turbine buildings, intake and discharge canals, and auxiliary buildings, the site includes switchyards, an ISFSI, a training center, the retired Peach Bottom Unit 1 (a prototype high-temperature, gas-cooled reactor now in SAFSTOR decommissioning), and a public boat ramp and picnic area (Exelon 2001a).

2.1.1 External Appearance and Setting

The terrain on either side of Conowingo Pond is steeply hilly. Immediately behind the Peach Bottom site is a rock cliff that was created when part of a hill was cut away for site construction. It rises to an elevation of about 90 m (300 ft) above the river. With the exception of the stack, the plant is not visible from the farming communities located near the site. The plant is visible only from the river and residences on the shores of Conowingo Pond.

The geological location of the site is in the Piedmont Upland Province. It is bounded on the southeast by the Coastal Plain, from which it is separated by the Fall Line, and on the northwest by the Triassic Lowland Section of the Piedmont Province. The Piedmont Upland is a dissected plateau surface with a gently rolling topography. It is underlain by the rocks of the Glenarm series, which are believed to be of late Precambrian or early Paleozoic age. The site itself is underlain by the Peters Creek Schist, probably a member of the widespread Wissahickon Schist. Just to the south is the long, narrow Peach Bottom syncline in which are exposed the somewhat younger Cardiff conglomerate and the Peach Bottom Slate. This small syncline is one of the few structures in the area that can be identified although one or more faults are believed to trend northeast-southwest parallel to the regional structure. The fault nearest to the site is 1.6 km (1 mi) to the southeast. However, these faults, as well as more recent but still ancient faults to the northwest in the Triassic Lowland section, have been inactive for at least 140 million years and are not probable sources for an earthquake (AEC 1973).

The Peters Creek Schist is weathered to a depth of 4.6 to 18 m (15 to 60 ft). This weathered material has been removed for the foundations of the heavier structures. The underlying fresh rock is firm and strong and provides a good foundation for the plant (AEC 1973).

2.1.2 Reactor Systems

Peach Bottom has two active nuclear reactor units (Units 2 and 3) as shown in Figure 2-3. Each unit includes a boiling light-water reactor and a steam-driven turbine generator manufactured by General Electric Company. The architectural engineer and constructor was Bechtel Corporation. Each unit was licensed for an output of 3293 megawatts-thermal (MW(t)), with a design net electric rating of 1,065 megawatts-electric (MW(e)). Units 2 and 3 achieved commercial operation in July 1974 and December 1974, respectively. The facility's net

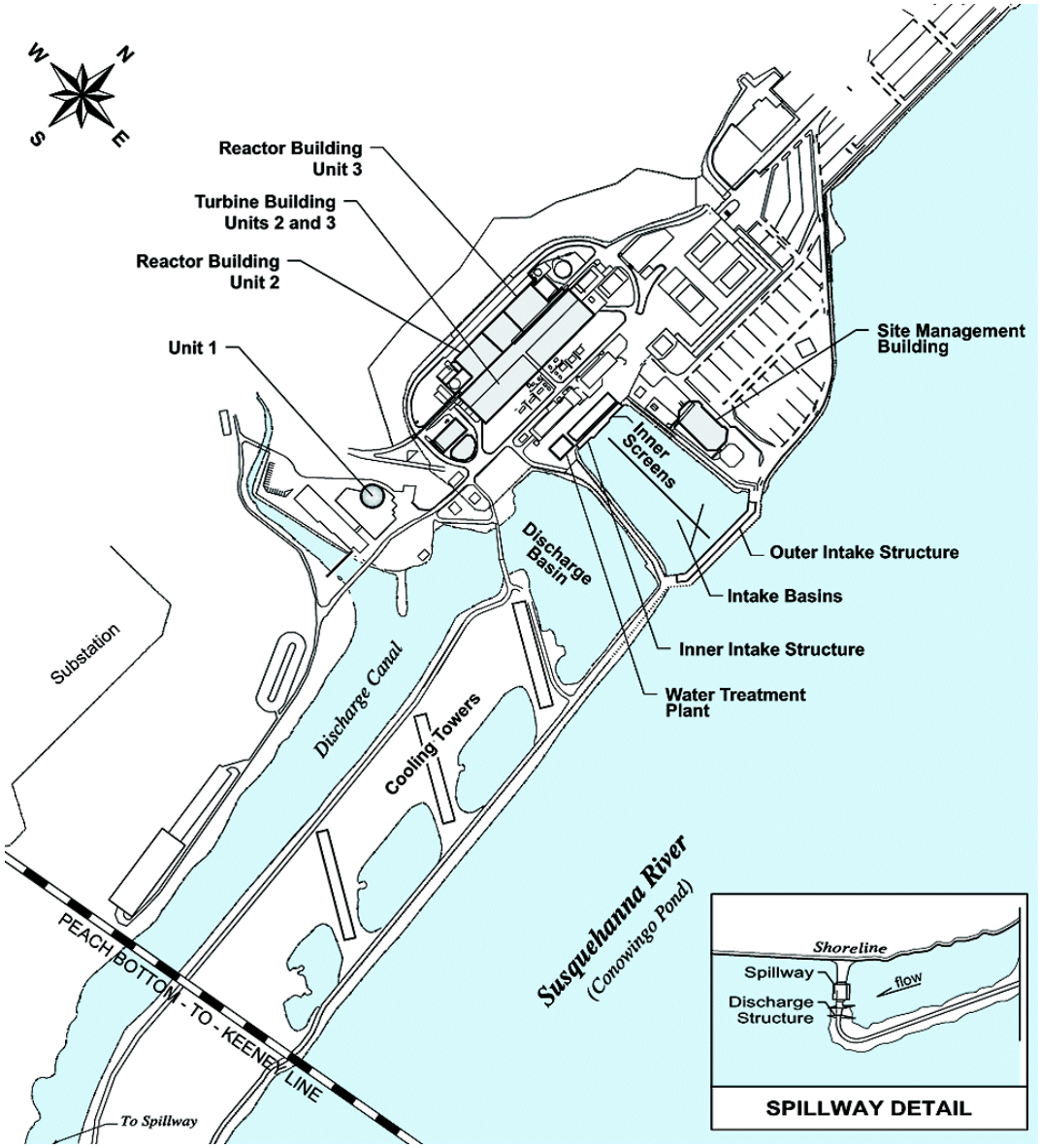

Figure 2-3. Peach Bottom Station Layout

generating capacity was subsequently increased by 60 MW(e). An NRC-prepared environmental assessment and finding of no significant impact concluded that there were no measurable environmental impacts associated with the power uprate. Both units have been

uprated to a core power output of 3458 MW(t). Exelon (at that time known as Philadelphia Electric Company, or PECO) received its uprate amendment for Unit 2 in 1994 and for Unit 3 in 1995. Each unit's gross output is 1160 MW(e). The net capacity of each unit is 1093 MW(e) (Exelon 2001a).

Each reactor's primary containment is a pressure-suppression system consisting of a dry well, pressure-suppression chamber, vent system, isolation valves, containment cooling system, and other service equipment. Each containment system is designed to withstand an internal pressure of 62 pounds per square inch above atmospheric pressure (psig). Together with its engineered safety features, each containment system is designed to provide adequate radiation protection for both normal operation and postulated design-basis accidents, such as earthquakes or loss of coolant. Peach Bottom Units 2 and 3 fuel is low enriched uranium dioxide with enrichments below 5 percent by weight uranium-235 and fuel burn-up levels less than 60,000 megawatt-days per metric ton uranium (Exelon 2001a).

Peach Bottom Unit 1 is located adjacent to Units 2 and 3. It was a prototype, high-temperature, gas-cooled reactor that had a net electrical output of 40 MW(e) (115 MW(t)) and operated from 1966 to 1974. Since then it has been maintained in SAFSTOR. Unit 1 will be decommissioned in the future and is not part of this license renewal application.

2.1.3 Cooling and Auxiliary Water Systems

Peach Bottom Units 2 and 3 use a once-through heat dissipation system that withdraws water from and discharges to Conowingo Pond, a 3600 ha (9000 acre) reservoir on the lower Susquehanna River (Figure 2-3). Water withdrawn from Conowingo Pond passes through a series of intake structures before it is circulated through two main condensers (one for each unit). From the condensers, the water passes through a series of discharge structures and the Conowingo Pond where the heat is dissipated to the environment. The temperature of the cooling water can increase as much as 11.5 °C (20.8 °F) as it passes through the condensers. Exelon also maintains three mechanical-draft "helper" cooling towers with the capacity to divert approximately 60 percent the circulating water flow through the cooling towers. During normal operations, circulating water moves through the plant from the intake structure to the discharge structure in approximately 88 minutes; when three cooling towers are in operation, the transit time is approximately 109 minutes.

The Peach Bottom site is not connected to a municipal water system and acquires all makeup water for the once-through heat dissipation system and potable water from the Susquehanna River. When both units are operating, six circulating water pumps (each rated at 950 m^3/min [250,000 gpm]) draw water from Conowingo Pond at a total rate of 5700 m^3/min (1.5 million gpm). A small fraction of the water is treated at a package plant onsite for use as potable water. Sanitary waste water is treated onsite and discharged to the discharge canal.

The principal components of the circulating water system are the outer intake structure, two intake basins, inner circulating water pump intake structures, condensers, cooling towers, discharge canal, and discharge structure as shown in Figure 2-3.

Water from Conowingo Pond flows into the outer intake structure. The outer intake (or "screenwell") structure is 148 m (487 ft) long along the west bank of Conowingo Pond, parallel to the long axis of the reservoir. Trash racks protect 32 outer intake openings and prevent large floating debris and ice floes from reaching 24 traveling screens. The traveling screens are designed to prevent fish and small debris from entering the system. The screens are made of 1-cm (3/8-in) square mesh and are placed approximately 12 m (40 ft) behind the outer trash racks in the outer intake structure. The rotating screens are washed every 24 hours or when there is a pressure differential between the sides of the screen; the trash and debris are removed to a trash collection area and eventually disposed of at an offsite landfill.

From the outer intake structure, water enters two intake basins. Cooling water for the condensers is withdrawn from the two intake basins. Each basin is 210 m (700 ft) long and 60 m (200 ft) wide. Sediment deposited in these basins is dredged and deposited to one of three onsite landfills. This dredging operation is infrequent (about once in 20 years of operation) but may occur during the license renewal period.

At the end of the two intake basins opposite the outer intake structure is the inner circulating water pump intake structure with six circulating water pump intakes, three in the south basin for Unit 2 and three in the north basin for Unit 3. The inner pump intakes are also protected by traveling screens made of 1-cm (3/8-in) mesh. As with the other screens, the traveling screens for the inner pump intakes are washed every 24 hours or when there is a pressure differential between the sides of the screen; the wash water is returned to the intake basin and the screenings are disposed of at an offsite landfill.

The two condensers are equipped with a system that circulates polyethylene tube cleaners (flexible, cylindrical plugs) through the condenser tubes to prevent the accumulation of deposits and biofouling organisms. The system is also intended to reduce the station's use of oxidizing biocides, such as sodium hypochlorite. The polyethylene tube cleaners are periodically circulated into the circulating water pump discharge line, passed through the condenser and retrieved at the discharge canal for reuse. If the tube cleaner system is out of service for an extended period, sodium hypochlorite may be injected into the system, normally one section of a condenser at a time to minimize the amount of chlorine discharged.

From the condensers, cooling water discharges into a discharge basin approximately 210 m (700 ft) long and 120 m (400 ft) wide. From the discharge basin, the heated cooling water normally flows directly into a 1430 m (4700 ft) long discharge canal. As necessary, 60 percent of the circulating water can also be diverted to the three mechanical-draft helper cooling towers

for additional cooling before discharge to the canal. At the end of the discharge canal is the discharge structure, which contains one permanent opening (spillway) and three adjustable gates that control the flow to Conowingo Pond. The three adjustable gates maintain the velocity of the discharge to between 1.5 and 2.4 m/s (5 and 8 ft/s). A recent study (Normandeau 2000) indicates that water temperatures at the point of discharge were mostly about 11 °C (20 °F) above the intake temperature.

2.1.4 Radioactive Waste Management Systems and Effluent Control Systems

Peach Bottom Units 2 and 3 use liquid, gaseous, and solid radioactive waste management systems to collect and process the liquid, gaseous, and solid wastes that are the by-products of the reactor unit operation. These systems reduce radioactive liquid, gaseous, and solid effluents before they are released to the environment. The waste disposal system meets the design objectives of 10 CFR Part 50, Appendix I (Numerical Guide for Design Objectives and Limiting Conditions for Operation to meet the criterion "As Low As is Reasonably Achievable" for Radiological Material in Light-Water-Cooled Nuclear Power Reactor Effluents), and controls the processing, disposal, and release of radioactive liquid, gaseous, and solid wastes (PECO 2001b).

The liquid and solid wastes from both Units 2 and 3 are routed to a common radioactive waste (radwaste) building for collection, treatment, sampling, and disposal. Packaged solid wastes and reusable radioactive material may be temporarily stored in the radwaste on-site storage facility, or in approved outside storage locations. Gaseous wastes are processed and routed to a common high stack for release to the atmosphere. The liquid and gaseous radwaste systems are designed to reduce the activity in the liquid and gaseous wastes such that the concentrations in routine discharges are less than the applicable regulatory limits. The liquid and gaseous effluents are continuously monitored and the discharge is stopped if the effluent concentrations exceed predetermined limits.

Radioactive fission products build up within the fuel as a consequence of the fission process. These fission products are contained in the sealed fuel rods, but small quantities escape from the fuel rods and contaminate the reactor coolant. Neutron activation of the primary coolant system is also responsible for coolant contamination. Non-fuel solid wastes result from treating and separating radionuclides from gases and liquids and from removing contaminated material from various reactor areas. Solid wastes also consist of reactor components, equipment, and tools removed from service, as well as contaminated protective clothing, paper, rags, and other trash generated from plant operations and design modifications and routine maintenance activities. Solid wastes may be shipped to a waste processor for volume reduction before disposal or they may be sent directly to the licensed burial site. Spent resins and filters are stored or packaged for shipment to an offsite processing or disposal facility.

Fuel rods that have exhausted a certain percentage of their fuel and are removed from the reactor core for disposal are called spent fuel. Peach Bottom Units 2 and 3 currently operate on a 24-month refueling cycle per unit, with one refueling at the site every year. Spent fuel is stored onsite in the spent fuel pool or at the ISFSI.

The *Offsite Dose Calculation Manual* (ODCM) for Peach Bottom Units 2 and 3 describes the methods used for calculating radioactivity concentrations in the environment and the estimated potential offsite doses associated with liquid and gaseous effluents from Peach Bottom (PECO 2001a). The ODCM also specifies controls for release of liquid and gaseous effluents to ensure compliance with the following:

- The concentration of radioactive liquid effluents released from the site to areas at or beyond the site boundary will not exceed 10 times the concentration specified in 10 CFR Part 20, Appendix B, Table 2, Column 2, for radionuclides other than noble gases. For dissolved or entrained noble gases, the concentration shall not exceed 7.4 Bq/mL (2×10^{-4} μCi/mL).

- The dose or dose commitment to a member of the public from any radioactive materials in liquid effluents released from the two reactors at the site to the areas at or beyond the site boundary shall be limited to: (1) less than or equal to 30 μSv (3 mrem) to the total body and less than or equal to 100 μSv (10 mrem) to any organ during any calendar quarter; and (2) less than or equal to 60 μSv (6 mrem) to the total body and less than or equal to 200 μSv (20 mrem) to any organ during any calendar year.

- Under the provisions of 10 CFR Part 20, the dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to (1) less than or equal to 5 mSv/yr (500 mrem/yr) to the total body and less than or equal to 30 mSv (3000 mrem/yr) to the skin due to noble gases, and (2) less than or equal to 15 mSv/yr (1500 mrem/yr) to any organ due to iodine-131, iodine-133, tritium, and for all radioactive materials in particulate form with half-lives greater than 8 days. Additionally, with respect to radioiodines and particulates, consistent with Appendix I to 10 CFR Part 50, these doses are limited to less than or equal to 0.15 mSv (15 mrem) during any calendar quarter and less than or equal to 0.30 mSv (30 mrem) during any calendar year.

- The air dose at and beyond the site boundary due to noble gases in gaseous effluents released from the two reactors at the site shall be limited to: (1) less than or equal to 100 μGy (10 mrad) for gamma radiation and less than or equal to 200 μGy (20 mrad) for beta radiation during any calendar quarter; and (2) less than or equal to 200 μGy (20 mrad) for gamma radiation and less than or equal to 400 μGy (40 mrad) for beta radiation during any calendar year.

- The dose to any individual member of the public from all uranium fuel cycle sources will not exceed the maximum limits of 40 CFR Part 190 (<0.25 mSv [25 mrem]) and 10 CFR Part 20 (5 mSv [500 mrem] in a year and 20 μSv [2 mrem] in any hour).

2.1.4.1 Liquid Waste Processing Systems and Effluent Controls

Potentially radioactive liquid wastes are generated from equipment drains, floor drains, containment sumps, the chemistry laboratory, the laundry drain, and miscellaneous sources. The liquid radwaste system collects, processes, stores, monitors, and disposes of all normal and potentially radioactive aqueous liquid wastes from both Units 2 and 3. Wastes are collected in sumps and drain tanks, and then transferred to the tanks in the Radwaste Building for treatment, storage, monitoring, and disposal. The liquid radwaste system is designed to collect various types of liquid wastes separately so that each type of waste can be processed by those methods most appropriate to that type. Liquid wastes are processed on a batch basis, and each batch is sampled to determine that all discharge requirements are met prior to release from the waste system (PECO 2001b). Tanks, equipment, and piping that contain liquid radioactive wastes are enclosed within radwaste areas in buildings or tunnels and are shielded where required to permit operation, inspection and maintenance with acceptable personnel exposures. These areas are drained to sumps that return the liquid to the radwaste system. Liquid requiring cleanup before being discharged to the environment is filtered, demineralized, and sampled. Other drains, sumps, etc., in the plant that do not handle potentially radioactive liquid are not part of this system. This other equipment is used in the collection and disposal of non-radioactive wastes from equipment or areas that are not radioactive or subject to radiological control.

Processed aqueous liquid wastes may be returned to the Condensate System for plant re-use or discharged to the environment after analysis and dilution with condenser circulating water. Liquid wastes may also be packaged for off-site disposal.

Liquid effluents with moderate to high conductivity and generally low radioactive concentrations (low purity water) are pumped to a floor drain collector tank on a batch basis. These effluents are processed through a pressure-precoat type filter and/or mixed bed demineralizer and pumped to the floor drain sample tank. After sampling and analysis, they can be discharged to the environment through the circulating water discharge canal at a controlled rate or pumped to the condensate storage tank if the water quality meets the condensate storage tank water standards. Liquid effluents having conductivity higher than suitable for plant re-use and with radioactivity concentration higher than can be safely released to the environment are processed for proper disposal.

Liquid effluents with chemical wastes such as laboratory drains and chemical decontamination solutions are processed through the chemical waste tank in the Radwaste Building to the radwaste floor drain sump or batch processed to the floor drain collector tank for filtration and dilution along with floor drain waste.

Liquid waste containing detergents or similar cleaning agents or chemicals from the laundry drains, cask wash down, and personnel decontamination station drains is collected and processing may be through the laundry drain filter or through temporary processing equipment specifically configured for treatment of the liquid waste stream, the Chemical/Oily Waste Cleanup Subsystem.

Wastewater containing oils, cleaning agents or chemicals may also be collected in designated drums located in areas around the plant where such wastes are generated. These drums of liquid are transported to the Radwaste Building for processing as required. Processed liquids or wastewater which are acceptable for release without processing are transferred to one of the two laundry drain tanks and isolated. Each isolated batch for discharge is sampled during recirculation. If acceptable for release, it is then discharged to the environment through the laundry drain filter.

Four tanks, which contain potentially radioactive water, are located outside the plant building structures. They are the refueling water storage tank, two condensate storage tanks, and the Torus dewatering tank. These tanks are enclosed within watertight dike structures with adequate capacity to contain the contents of the largest single tank. In the event of leaks, spills, or overflows from these tanks, control of the liquid radioactive waste is ensured. Sumps collect liquid from each of the watertight dike structures. From the sumps, the water is either drained by gravity to the liquid radwaste system for processing or is released to the storm sewer (if rain water, etc.). Prior to any release to the storm sewer, any liquid in these sumps is sampled and analyzed for radioactivity to ensure no significant radioactivity is released to the environment from this source.

All systems are protected against overflow and similar undesirable conditions by appropriate alarms and shutdown devices. The ODCM prescribes the alarm/trip set points for the liquid effluent radiation monitors, which are derived from 10 times the effluent concentration limits provided in 10 CFR Part 20, Appendix B, Table 2, Column 2. The alarm/trip set point for each liquid effluent monitor is based on the measurements of radioactivity in a batch of liquid to be released or in the continuous liquid discharge (PECO 2001a).

During 2000, the total volume of liquid effluents from Peach Bottom Units 2 and 3 was 3630 m^3 (958,000 gal), including 69 batch releases. The actual liquid waste generated is reported in the *Peach Bottom Atomic Power Station, Unit Numbers 2 and 3, Radioactive Effluent Release*

Report, No. 43 (Exelon 2001e). These are typical quantities released to the environment, and Exelon does not anticipate any increase in liquid released during the renewal period. See Section 2.2.7 for a discussion of the theoretical doses to the maximally exposed individual as a result of these releases.

2.1.4.2 Gaseous Waste Processing Systems and Effluent Controls

Radioactive gaseous effluents include low concentrations of fission-product noble gases (such as krypton and xenon), halogens (mostly iodines), tritium contained in water vapor, and particulate material including both fission products and activated corrosion products. Each reactor unit is provided with a gaseous radwaste/off-gas system, which includes condenser air removal subsystems, and gland seal steam exhauster subsystems that discharge to a common main stack. The condenser air removal subsystem is utilized to establish a vacuum in the three main condenser sections and to maintain this vacuum during normal plant operation by removing non-condensable gases. The subsystem removes the condenser gases, which include radiolytic oxygen and hydrogen, air in-leakage, and radioactive fission and activation gases (PECO 2001b).

Subsystem exhaust is cooled in the recombiner condenser where essentially all water vapor (from process steam and recombination) is condensed and drained to the main condenser via the condensate drain tank. The remaining non-condensables pass through charcoal adsorber beds and high efficiency particulate air (HEPA) filters before atmospheric release through a common main stack, which stands approximately 200 m (650 ft) above the plant grade.

Continuous main stack radiation monitoring at sample points in the stack base provides an indication of radioactive releases from the off-gas system. The off-gas effluent radiation monitor and control system is used to monitor the condition of reactor fuel and alert operators if off-gas activity levels are increasing.

The ODCM prescribes alarm/trip set points for the monitor and control instrumentation to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20 for gaseous effluents (PECO 2001a). The actual gaseous effluents for year 2000 are reported in the *Peach Bottom Atomic Power Station, Unit Numbers 2 and 3, Radioactive Effluent Release Report, No. 43* (Exelon 2001e). These are typical quantities released to the environment, and Exelon does not anticipate any increase in gaseous releases during the renewal period. See Section 2.2.7 for a discussion of the theoretical doses to the maximally exposed individual as a result of these releases.

2.1.4.3 Solid Waste Processing

Solid wastes from Peach Bottom Units 2 and 3 consist of spent (dewatered) resin, solidified resin, filters, sludge, evaporator bottoms, dry compressible waste, irradiated components (control rods, etc.), and other non-compressible waste. The solid radwaste system consists of those systems and components that are used to condition and package wet and dry solid wastes so that the waste is suitable for transport and disposal. The system is not used for spent fuel storage and shipment. Temporary storage capacity for packaged solid wastes is provided by the onsite storage facility or in approved outside storage locations. Different methods are used for processing and packaging solid radioactive wastes, depending primarily upon the waste characteristics. The solid radwaste system includes the phase separators, which serve as an interface with the liquid radwaste processing system and the dewatering system. The dewatering system is the system used to dewater filter and demineralizer material to meet burial site and 10 CFR 61.56 requirements. High integrity containers (HICs) are the disposal package used when the waste classification requires that the waste meet stability requirements. Only HICs certified acceptable for use at the disposal facility to which the waste is destined are used (PECO 2001b).

Dry active wastes (DAWs), generated as a result of operation and maintenance activities, are collected throughout the radiological controlled areas of the facility. Typical wastes of this type are air filters, cleaning rags, protective tape, paper and plastic coverings, discarded contaminated clothing, tools, equipment parts, and solid laboratory wastes. Most DAWs have relatively low radioactive content and may be handled manually. DAWs are collected from throughout the plant in packages, and most are loaded into containers for shipment to an offsite processor for decontamination or further volume reduction prior to disposal. DAWs that do not meet the criteria for processing by the offsite processor may be packaged for direct shipment to a disposal facility. Selected items may be decontaminated onsite as practical for reuse or release as clean. DAWs are monitored as packaged to ensure applicable controls are maintained. Most DAW packages are loaded into containers until a sufficient volume has been collected to fill the container for transport. Packaged dry wastes may also be stored in the onsite storage facility or in approved outside storage locations.

Wet solid radwastes result from the processing of spent demineralizer resins (both bead and powdered) and spent filter material from the equipment drain and floor drain subsystems, and from the three (reactor, condensate, and fuel pool) water cleanup systems. The wastes are spent demineralizer resins and filter material water slurries, which are collected in the four backwash receiving tanks or in the waste sludge tank. The slurries collected in the Condensate and Reactor Water Cleanup backwash receiving tanks are pumped on a batch basis to one of the corresponding phase separators for collection and decay. The slurry is stagnant in the phase separator, allowing solids to settle so that clarified liquid may be decanted off the top. The process continues until a sufficient quantity of solids is collected for processing.

The radwaste filter demineralizers, radwaste deep bed demineralizers, and fuel pool filter demineralizers are backwashed to the Waste Sludge Tank. When a sufficient volume has been collected in the tank, its contents are pumped to a condensate phase separator for further processing. When sufficient volume has been collected in a phase separator, that phase separator is isolated and its contents mixed to obtain a homogeneous slurry in the required solids concentration range. The slurry is then pumped to the dewatering system.

Filled HICs may be stored inside shielded cells located within the onsite storage facility. This facility is designed to allow for remote handling. Cell covers are installed subsequent to a storage or retrieval operation when shielding is required. Floor drains from each cell are routed to a collection tank for sampling and analysis prior to transfer to the non-radioactive sump for discharge, or if radioactive, for processing via a portable demineralizer or transfer to a mobile processing system. Normal discharge is made from the non-radioactive sump to the storm drain system after sample analysis and sump contents monitoring show acceptably clean water. The discharge valve is interlocked to a radiation monitor to prevent inadvertent discharge of contaminated liquids.

Disposal and transportation of solid radioactive wastes are performed in accordance with the applicable requirements of 10 CFR Part 61 and Part 71, respectively. There are no releases to the environment from solid radioactive wastes created at Peach Bottom Units 2 and 3. In 2000, Peach Bottom Units 2 and 3 made 115 shipments of solid radioactive waste with a volume of 186 m^3 (6557 ft^3) and a total activity of 5.4 TBq (146 Ci) (Exelon 2001e). These shipments are representative of the shipments made in the past 5 years and are not expected to change appreciably during the license renewal period.

2.1.5 Nonradioactive Waste Systems

The principal nonradioactive effluents from the Peach Bottom Units 2 and 3 consist of hazardous (chemical) wastes, lubrication oil wastes, and sanitary wastes. The Peach Bottom site is a small quantity hazardous material generator, with generation amounts less than 1000 kg/yr (2200 lb/yr). The lubrication oils are normally injected into the auxiliary boiler fuel feed. Some lubrication oil may be disposed of as waste, typically 7600 L/yr (2000 gal/yr) for offsite disposal. Spent batteries and discarded fluorescent lights are recycled. Sanitary waste is sent to the onsite sewage treatment plant, which treats a volume of approximately 6800 L/day (1800 gal/day), and can handle up to 57,000 L/day (15,000 gal/day). The sanitary treatment facility is an extended aeration type with sludge settling and chlorination facilities. The liquid effluents from the sewage treatment plant are discharged to the circulating water discharge canal, from which they are discharged into Conowingo Pond (AEC 1973).

2.1.6 Plant Operation and Maintenance

Routine maintenance performed on plant systems and components is necessary for safe and reliable operation of a nuclear power plant. Maintenance activities conducted at Peach Bottom Units 2 and 3 include inspection, testing, and surveillance to maintain the current licensing basis of the plant and to ensure compliance with environmental and safety requirements. Certain activities can be performed while the reactor is operating. Others require that the plant be shut down. Long-term outages are scheduled for refueling and for certain types of repairs or maintenance, such as replacement of a major component. Each of the two nuclear units is refueled on a 24-month schedule, resulting in an average of one refueling every year for the site. During refueling outages, site employment increases by as many as 800 workers for temporary duty (typically, 30 to 40 days). PECO provided an appendix (Appendix A) in the *Updated Final Safety Analysis Report* (PECO 2001b) regarding the aging management review to manage the effects of aging on systems, structures, and components in accordance with 10 CFR Part 54. The Peach Bottom Units 2 and 3 license renewal application describes the programs and activities that will manage the effects of aging during the license renewal period. Exelon expects to conduct the activities related to the management of aging effects during plant operation or normal refueling and other outages, but plans no outages specifically for the purpose of refurbishment. Exelon has no plans to significantly add additional full-time staff (non-outage workers) at the plant during the period of the renewed licenses.

2.1.7 Power Transmission System

Philadelphia Electric Company (PECO, now Exelon) built only one transmission line, the Peach Bottom-to-Keeney line, for the specific purpose of connecting Peach Bottom Units 2 and 3 to the transmission system (Exelon 2001a). Beginning at the Peach Bottom south substation (Figure 2-4), this 500-kilovolt-transmission line (designated as the 5014 line) runs approximately 55 km (34 mi) eastward to the Keeney substation in northwestern Delaware. The transmission line right-of-way is 90 m (300 ft) (or more) wide. In Pennsylvania and Maryland the right-of-way is maintained by Exelon. In Delaware the right-of-way is maintained by Conectiv Power Delivery. “Right-of-way” is a general term used to identify the land over which a transmission line travels. The right-of-way passes through land that is primarily a mixture of farmland and woodlands. These lands generally continue to be used in the same fashion as they were before the line was constructed (Exelon 2001a). The transmission right-of-way also contains other transmission lines, most notably the 230-kV line from the Colora to the Cecil substations, which shares the right-of-way for approximately 19 km (12 mi).

Exelon designed the 5014 Line in accordance with the 1967 edition of the National Electrical Safety Code® (NFPA 1967) and industry guidance that was current when the line was designed. To ensure that design standards are maintained throughout the life of the transmission line, Exelon conducts transmission line and right-of-way surveillance and

maintenance. Routine aerial patrols are conducted twice each year and include checks for encroachments, broken conductors, broken or leaning structures, and signs of burned trees or charred vegetation, any of which would be evidence of clearance problems. Once every three years, all lines are inspected from the ground and measured for clearance at selected locations. Problems noted during any inspection are brought to the attention of the appropriate organizations for corrective action. The right-of-way is maintained on a five-year cycle by mowing and trimming and on a three-year cycle by the use of herbicides. The maintenance of the transmission right-of-way in Delaware is pursuant to the Memorandum of Understanding between Conectiv and the U.S. Fish and Wildlife Service (NRC 2002). Because the 5014 Line is integral to the larger transmission system, it would remain a permanent part of the transmission system even if Peach Bottom Units 2 and 3 are no longer operated.

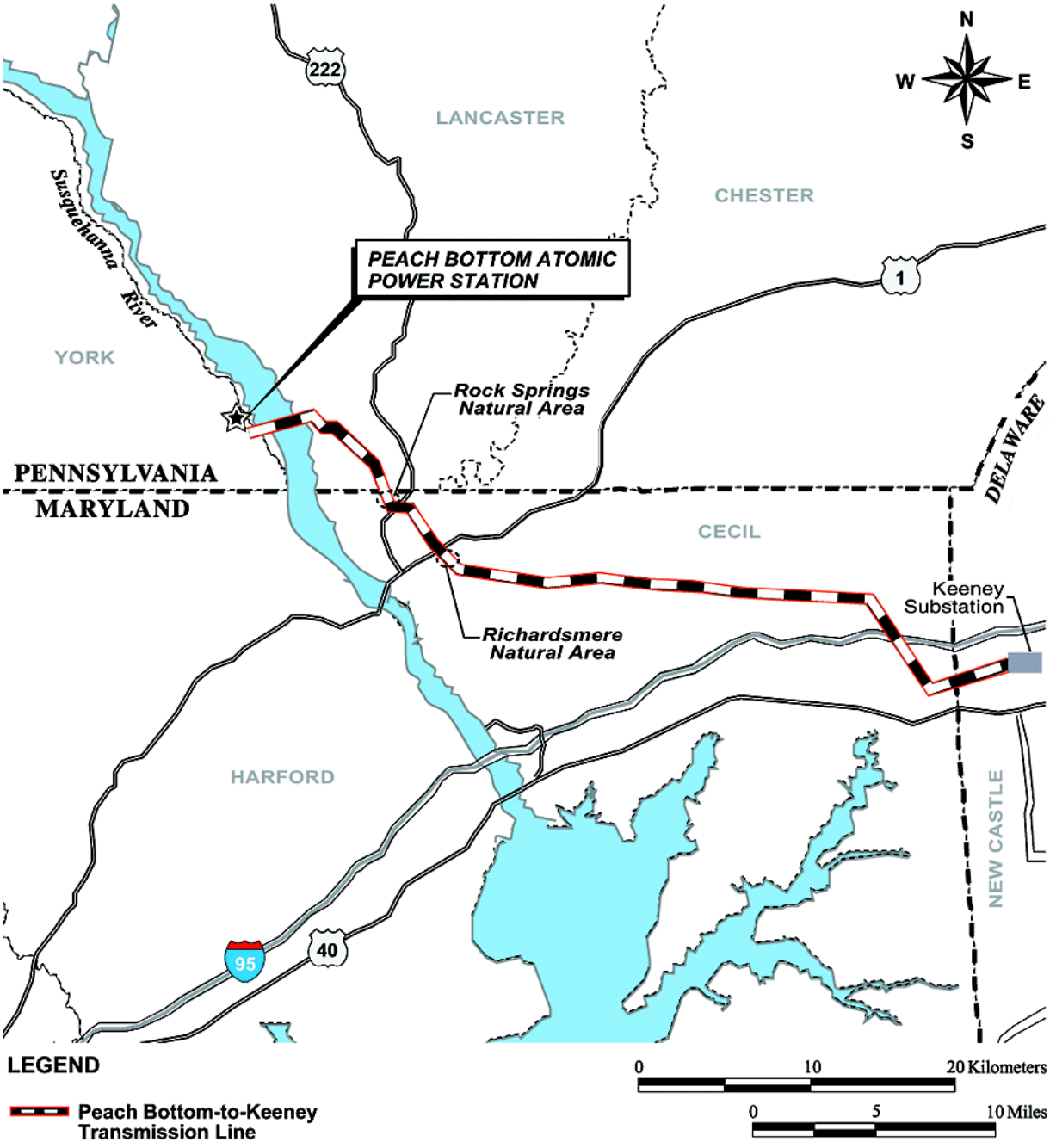

Figure 2-4. Peach Bottom Transmission Line Map

2.2 Plant Interaction with the Environment

Sections 2.2.1 through 2.2.8 provide general descriptions of the environment near Peach Bottom Units 2 and 3 as background information. They also provide detailed descriptions where needed to support the analysis of potential environmental impacts of refurbishment and operation during the renewal term, as discussed in Chapters 3 and 4. Section 2.2.9 describes the historic and archaeological resources in the area, and Section 2.2.10 describes possible impacts on other Federal project activities.

2.2.1 Land Use

The Peach Bottom site is located in Peach Bottom Township, York County, Pennsylvania, on the west side of Conowingo Pond. The plant site is approximately 31 km (19 mi) southwest of Lancaster, Pennsylvania; 48 km (30 mi) southeast of York, Pennsylvania; and 61 km (38 mi) north of Baltimore, Maryland. York is the county seat of York County. The Peach Bottom site consists of 248 ha (620 ac) of land. All industrial facilities associated with the site are located in York County. The area around the site is predominantly rural, characterized by farmland and woods (Exelon 2001a).

Section 307 (c)(3)(A) of the Coastal Management Act [16 USC 1456(c)(3)(A)] requires that applicants for federal licenses that conduct an activity in a coastal zone provide a certification that the proposed activity complies with the enforceable policies of the State's coastal zone program. The Peach Bottom site, located in York County, is not within the Pennsylvania coastal zone, and due to its distance (approximately 80 km [50 mi]) from the coastal zone, does not affect the Pennsylvania coastal zone. However, the Maryland coastal zone extends to Conowingo Pond from which Peach Bottom Units 2 and 3 withdraw and discharge water. The Maryland Department of the Environment issued the Certification of Compliance with the Maryland Coastal Zone Management Program on April 23, 2002.

2.2.2 Water Use

The Peach Bottom site acquires all its cooling water and potable water from Conowingo Pond. Conowingo Pond has a surface area of 3600 ha (9000 ac) and varies from 0.8 to 2.4 km (0.5 to 1.5 mi) in width. Exelon withdraws approximately 5700 m^3/min (1.5 million gpm) of process and potable water from Conowingo Pond.

From 1952 to 1999, the mean monthly average flow at the Susquehanna River at Holtwood Dam (approximately 10 km (6 mi) upstream from Conowingo Pond) was 1070 m^3/s

(38,370 cfs), with minimum and maximum monthly average flows of 42 m^3/s (1500 cfs) and 26,700 m^3/s (941,900 cfs) respectively. Normal pond elevation is approximately 33 m (109 ft) above mean sea level; during maximum Conowingo Dam operational drawdown, the elevation is about 30 m (99 ft) above mean sea level.

The Susquehanna River Basin Commission (SRBC) is the governing body that regulates withdrawals and diversions from the Susquehanna River. The Peach Bottom site is authorized to withdraw from Conowingo Pond per SRBC Resolution Numbers 93-04, 91-2, and 83-4.

Exelon also operates the Muddy Run Pumped Storage Facility approximately 8 river km (5 river mi) north of the Peach Bottom site. The pumped storage facility withdraws water from the Conowingo Pond at night and releases water to it during daytime periods of peak electric demand. With the operation of the pumped storage facility, the volume of Conowingo Pond varies from about 300 million m^3 (240,000 acre-ft) to 400 million m^3 (322,000 acre-ft) daily.

Cooling process water discharges into a discharge basin and discharge canal before final discharge to the Conowingo Pond. Sanitary waste water is processed in an onsite treatment plant and is also discharged to the discharge canal. Exelon does not withdraw groundwater for cooling or potable water. The Peach Bottom site does have several closed groundwater wells and four wells that provide non-potable water to remote facilities. One well in the Hazardous Materials Yard is 60 m (200 ft) deep and provides 0.02 m^3/min (6 gpm) for washing hands or rinsing equipment. A second well at the South Substation is 90 m (300 ft) deep and provides 0.004 m^3/min (1 gpm) to a toilet at the substation. Water from a third well at the Salt Storage Facility is used for washing trucks and the well at the North Substation provides water to a toilet. These two wells have withdrawal rates similar to the wells at the Hazardous Materials Yard and the South Substation.

Groundwater seeps intermittently from springs in the cliffs behind the Peach Bottom site. Each reactor building and the low-level radioactive waste storage building have sumps that collect the seepage which eventually evaporates. Groundwater that seeps from behind the low-level waste building also discharges to the storm drains.

2.2.3 Water Quality

In accordance with the Federal Water Pollution Control Act (also known as the Clean Water Act), the quality of plant effluent discharges is regulated through the National Pollutant Discharge Elimination System (NPDES). The Pennsylvania Department of Environmental Protection (PDEP) is authorized by the U.S. Environmental Protection Agency (EPA) to issue

discharge permits in Pennsylvania. The Peach Bottom site's NPDES permit (PA0009733) regulates all discharges to the Susquehanna River including process and cooling water, sanitary waste water, and storm water.

The NPDES permit (PA0009733) issued by PDEP in 2000 requires continuous monitoring of discharge temperature, but does not stipulate a maximum instantaneous discharge limit. In the event of a joint occurrence of low river flows (less than 85 m^3/s [3000 cfs]) and high ambient river water temperatures (greater than 29 °C [85 °F]), the NPDES permit requires the Peach Bottom site to take appropriate measures to ascertain the potential effects on the local fish community and notify PDEP. If cooling towers are required, tower startup will be initiated following station operating procedures.

Sodium hypochlorite can be injected into the condenser system to control biofouling when the mechanical system is out of service for an extended period. The NPDES permit (PA0009733) limits the instantaneous maximum total residual chlorine concentration at the outfall to 0.20 mg/L (2×10^{-6} lb/gal). Exelon also uses an quaternary-amine-based molluscide to control the Asiatic clam (*Corbicula fluminea*); Exelon is required to monitor and report to PDEP use of the molluscide. Any new regulations promulgated by the EPA or PDEP would be reflected in future permits.

2.2.4 Air Quality

The Peach Bottom site has a humid continental climate characterized by dominance from tropical air masses in summer and polar air masses in winter. Precipitation occurs throughout year with a typical increase in summer rainfall. Meteorological records for southeastern Pennsylvania (i.e., Harrisburg-Middletown area) are generally representative of the Peach Bottom site. The data from this area indicates that lowest precipitation amounts for the year generally last for about a month or two, typically in February and/or March. Mean or normal daily maximum temperatures for southeastern Pennsylvania range from 0 to 4.5 °C (32 to 40 °F) in January to 26.7 to 32.2 °C (80 to 90 °F) in July and August (NOAA 2001a). Normal minimum temperatures range from about -9.4 to -3.9 °C (15 to 25 °F) in January to about 15.6 to 21.1 °C (60 to 70 °F) in August. The mean annual precipitation ranges from 102 to 127 cm (30 to 40 in.). Normal monthly precipitation ranges from 5 to 8 cm (2 to 3 in.) in the dry season (i.e., February) to 8 to 13 cm (3 to 5 in.) in the wet season (NOAA 2001b).

Thunderstorms occur on average between 20 to 30 days per year (NOAA 2001a). During the period June through August, the daily occurrence of thunderstorms is about 5 to 7 days per month. Based on statistics for the 30 years from 1954 through 1983 (Ramsdell and Andrews 1986), the probability of a tornado striking the site is expected to be about 1×10^{-4} per year.

The wind resources are expressed in terms of wind power classes, ranging from class 1 to class 7 (Elliott et al. 1986). Each class represents a range of mean wind power density or approximate mean wind speed at specified heights above the ground. The wind energy resource in southeastern Pennsylvania is limited. The annual average wind power for this part of the State is rated 1 or 2. Areas designated class 3 or greater are suitable for most wind energy applications, whereas class 2 areas are marginal and class 1 areas are generally not wind power suitable.

Air quality in a given area is a function of the air pollutant emissions (type of pollutant; rate, frequency, duration, exit conditions, and location of release), atmospheric conditions (climate and meteorology), the area itself (size of airshed and topography of the area), and the pollutants transported from outside the area. Air quality within a 50 km radius of the Peach Bottom site is in compliance with National Ambient Air Quality Standards for all pollutants except ozone. The Peach Bottom site is in attainments with the exception of being in an ozone nonattainment area. Localized sources of emissions include man-made sources of industrial-, residential-, and transportation-related emissions. Natural sources of wind-blown dust contribute to temporary increases in air pollution.

The Peach Bottom site is located in York County, Pennsylvania, which is part of the South Central Pennsylvania Intrastate Air Quality Control Region (AQCR) (40 CFR 81.105). York County, and Lancaster County, immediately across the Susquehanna River from the site, are designated as a nonattainment areas for ozone and classified marginal. Nearby, the Metropolitan Philadelphia Interstate AQCR includes counties in Pennsylvania (Bucks, Chester, Delaware, Montgomery, and Philadelphia), New Jersey (Burlington, Camden, Gloucester, Mercer, and Salem), and Delaware (New Castle(40 CFR 81.15). These counties are designated as nonattainment for ozone (40 CFR 81.15, 81.105, and 81.339).

The Metropolitan Baltimore Intrastate AQCR is also near the site, and encompasses the following areas in Maryland: Anne Arundel County, Baltimore City, Baltimore County, Carroll County, Harford County, and Howard County. All counties in the Metropolitan Baltimore Intrastate AQCR are designated nonattainment for ozone and several zones within Baltimore City and Baltimore County do not meet primary standards for total suspended particulates (40 CFR 81.28 and 81.321). No Prevention of Significant Deterioration Class I areas exist within 100 km (62 mi) of the Peach Bottom site (Clean Air Act).

There are four diesel generators with rated capacities of 2600 kW (3490 hp) and two 52 MMBTU/hr boilers at the Peach Bottom plant (PECO 2001b). The diesels are used for emergency backup power and the boilers are used for space heating and to aid unit start-up. The diesel generators are tested with a 2-hour burn every two weeks. An endurance test involving a 24-hr burn is conducted once every two years. The four units are on a staggered endurance test schedule, with 1 of the 4 units tested every six months. Emissions from these

sources are regulated under Pennsylvania's Permit Operating Program under the Title V State permit number 67-05020 issued by the Commonwealth of Pennsylvania, Department of Environmental Protection, Air Quality Program. The current air emissions permit expires on February 29, 2004.

2.2.5 Aquatic Resources

For Peach Bottom Units 2 and 3, the staff has reviewed the 1966-1974 pre- and post-operational fish studies and the 1997-1999 studies that assessed the impact of zero-cooling-tower operation. These studies indicate that the species composition of the Conowingo Pond fish community has not changed significantly, with one exception. This exception is the installation of fish passage facilities at Conowingo Dam and other dams upstream of Peach Bottom Units 2 and 3 which have resulted in anadromous fish populations that migrate past the Peach Bottom site.

The resident fish of Conowingo Pond are, for the most part, common warm-water species (e.g., gizzard shad [*Dorosoma cepedianum]*, spotfin shiner [*Cyprinella spiloptera]*, channel catfish [*Ictalurus punctatus]*, tessellated darter [*Etheostoma olmstedi]*, and bluegill [*Lepomis macrochirus]*) that have a wide distribution from the southeastern U.S. to Canada (Normandeau Associates, Inc. 1998, 1999, 2000). Conowingo Pond is well known for its largemouth (*Micropterus salmoides*) and smallmouth bass (*M. dolomieui*) fishing, and also provides opportunities for striped bass (*Morone saxatilis*) and walleye (*Stizostedion vitreum*) fishing. Local and regional fishing clubs and organizations use Conowingo Pond for bass fishing tournaments during the spring, summer, and fall. The heated discharge from Peach Bottom Units 2 and 3, which attracts baitfish and game fish during most months of the year, is an especially popular fishing spot in winter.

The relative abundance of the gizzard shad changed during the 1970s and 1980s. They were introduced into Conowingo Pond during 1972 (PECO 1975). The gizzard shad is now one of the dominant species in the reservoir in terms of numbers and biomass. Large numbers of gizzard shad are lifted into Conowingo Pond every spring from the lower river, along with alewife (*Alosa pseudoharengus*) and American shad (*A. sapidissima*), and are likely to remain an important part of the ecosystem near the Peach Bottom site. During 1999, more than 950,000 gizzard shad were trapped below the Conowingo Dam and were lifted to Conowingo Pond (Susquehanna River Anadromous Fish Restoration Cooperative 2000).

Aside from the increase in the gizzard shad population, the only other significant change in the fish community of Conowingo Pond over the last 25 years has been the increase in numbers of anadromous fish (e.g., American shad, blueback herring [*A. aestivalis*], alewife, and striped bass) moving through Conowingo Pond during the spring and fall. No anadromous fish were

collected during 9 years (1966-1974) of monitoring Conowingo Pond's fish populations to assess potential impacts of the Muddy Run Pumped Storage Facility and Peach Bottom Units 2 and 3 (PECO 1975). During 1972, a consortium of utilities, and Federal, regional, and State agencies began trapping and transporting anadromous fish from downstream of Conowingo Dam to upriver locations. Fish lifts and fish ladders have been installed at Conowingo Dam and the other mainstem dams and transporting has been discontinued. Completion of the fishway at York Haven Dam, during spring 2000, gave migratory shad and river herring access to mainstem spawning areas and tributaries between the York Haven Dam and Harrisburg, Pennsylvania. Large numbers of adult American shad and blueback herring now move through Conowingo Pond during the spring, to upstream spawning locations (Susquehanna River Anadromous Fish Restoration Cooperative 2000). Juvenile shad and herring move downstream through the Pond during the fall en route to the Chesapeake Bay. The appearance of these anadromous species in Conowingo Pond is an indication of the success of the Susquehanna River anadromous fish restoration program. This program has dramatically increased the numbers of anadromous fish ascending the Susquehanna River during the spring to spawn.

The number of American shad trapped at Conowingo Dam and transported (prior to 1997) and lifted (from 1997 to present) upstream increased from 139 during 1980 to 15,964 during 1990 (Susquehanna River Anadromous Fish Restoration Cooperative 2000.), and to more than 150,000 during 2000 (Pennsylvania Fish & Boat Commission 2000). Additionally, large numbers of river herring (more than 130,000 during 1999) and substantial numbers of striped bass (1231 during 1999) also passed upstream at the Conowingo fish lift (Susquehanna River Anadromous Fish Restoration Cooperative 2000).

Only three freshwater mollusc taxa were collected in more than 8 years (1967-1974) of pre- and post-operational benthic monitoring conducted in support of Peach Bottom Units 2 and 3's CWA Section 316(a) Demonstration (Philadelphia Electric Company 1975). They included two common sphaerid genera, *Pisidium* and *Sphaerium*, and a single Unionid *(Utterbackia imbecili*s). Both the sphaerids and *Utterbackia* are common in lakes, reservoirs, and sluggish rivers of the Midwest and Northeast. The most significant change in the Conowingo Pond mollusc community during the last several decades has been the appearance and rapid colonization since the mid-1980s of the exotic Asiatic clam, *Corbicula* sp.

2.2.6 Terrestrial Resources

The Peach Bottom site is located within the northern piedmont ecoregion (Omernik 1987). Prior to European settlement the region was dominated by oak-chestnut forests which have subsequently been lost or altered because of timber cutting, farming, and the introduction of chestnut blight in the early 1900s. Second growth forests in the plant vicinity are now

characterized as oak-hickory or oak-tulip tree assemblages with a variety of subcommunity types depending on the local terrain (USAEC 1973). Most of the land in the vicinity of the Peach Bottom site and the Peach Bottom-to-Keeney transmission line is rolling hills covered with a mixture of farmland (including row crops, pasture, and old fields) and woodlots. Landuse, vegetative communities, and wildlife habitats in both areas have not changed significantly over the past 25 years.

In the vicinity of the Peach Bottom site and transmission line, there are three terrestrial species listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS) and one species that has been delisted by the FWS (Table 2-1). An additional 53 species listed as threatened, endangered, or of concern by the States of Pennsylvania and/or Maryland are known to occur near the Peach Bottom site or the associated transmission right-of-way (Table 2-1).

Table 2-1. Federal and State Endangered, Threatened, and Candidate Plant and Terrestrial Animal Species Currently or Historically Occurring in the Vicinity of the Peach Bottom Site or the Peach Bottom-to-Keeney Transmission Line.

Scientific Name	Common Name	Federal Status[(a)]	PA Status[(a,b)]	MD Status[(a,c)]
Cryptotis parva	least shrew	—	E	—
Myotis leibii	eastern small-footed myotis	—	T	—
Neotoma magister	eastern woodrat	—	T	E
Sorex fumeus	smoky shrew	—	—	T
Ammodramus henslowii	Henslow's sparrow	—	—	T
Asio flammeus	short-eared owl	—	E	—
Bartramia longicauda	upland sandpiper	—	T	E
Botaurus lentiginosus	American bittern	—	T	—
Casmerodius albus	great egret	—	T	—
Cistothorus platensis	sedge wren	—	T	T
Dendrocia fusca	Blackburnian warbler	—	—	T
Falco peregrinus	peregrine falcon	DM	E	E
Haliaeetus leucocephalus	bald eagle	T	E	E
Ixobrychus exilis	least bittern	—	T	—
Lanius ludovicianus	loggerhead shrike	—	E	E
Nyctanssia violacea	yellow-crowned night heron	—	E	—
Oporornius philadelphia	mourning warbler	—	—	E
Pandion haliaetus	osprey	—	T	—
Rallus eleganus	king rail	—	E	—
Ambystoma tigrinum	tiger salamander	—	—	E
Pseudotriton montanus	mud salamander	—	E	—

Table 2-1. (contd)

Scientific Name	Common Name	Federal Status[a]	PA Status[a,b]	MD Status[a,c]
Clemmys muhlenbergii	bog turtle	T	E	T
Opheodrys aestivus	rough green snake	—	T	—
Pseudemys rubriventris	red-bellied turtle	—	T	—
Speyeria idalia	regal fritillary	—	E	E
Agrimonia microcarpa	small-fruited agrimony	—	—	E
Agrimonia striata	woodland agrimony	—	—	E
Arethusa bulbosa	dragon's mouth	—	E	—
Aster depauperatus	serpentine aster	—	T	E
Bromus latiglumus	broad-glumed brome	—	—	E
Carex buxbaumii	Buxbaum's sedge	—	—	T
Carex hitchcockiana	Hitchcock's sedge	—	—	E
Carex hystericina	porcupine sedge	—	—	E
Carex mesochorea	midland sedge	—	—	E
Carex polymorpha	variable sedge	—	E	—
Clematis occidentalis	purple clematis	—	—	E
Deschampsia caespitosa	tufled hairgrass	—	—	E
Desmodium rigidum	rigid tick-trefoil	—	—	E
Dodecatheon amethystinum	jeweled shooting-star	—	T	—
Euphorbia purpurea	glade spurge	—	E	E
Gentainopsis crinita	fringed gentian	—	—	E
Gentiana andrewsii	fringe-tip closed gentian	—	—	T
Helonias bullata	swamp pink	T	—	E
Hydrastis canadensis	goldenseal	—	—	T
Leptochloa fascicularis	long-awned diplachne	—	—	E
Panicum oligosanthes	few-flowered panicgrass	—	—	E
Pycnanthemum verticillatum	whorled mountain mint	—	—	E
Rhynchospora globularis	grass-like beakrush	—	—	E
Sanguisorba canadensis	Canada burnet	—	—	T
Scleria reticularis	reticulated nutrush	—	E	—
Scutellaria leonardii	Leonard's skullcap	—	—	T

Table 2-1. (contd)

Scientific Name	Common Name	Federal Status[a]	PA Status[a,b]	MD Status[a,c]
Scutellaria nervosa	veined skullcap	—	—	E
Solidago speciosa	showy goldenrod	—	—	E
Sporobolus heterolepsis	northern dropseed	—	—	E
Stenanthium gramineum	featherbells	—	—	T
Talinum teretifolium	fame flower	—	—	T
Tomanthera auriculata	eared false-foxglove	—	E	—

(a) T = Threatened; E = Endangered; DM = Delisted, monitored for first 5 years
(b) Pennsylvania status as of 11/13/01, (PDCNR 2001)
(c) Maryland status as of 11/13/01, (MDNR 2001)
— = Not listed or protected (or does not occur in the state)

Bald eagles are listed as threatened by the FWS and as endangered by the Pennsylvania Game Commission**.** There are at least 4 active bald eagle nests within the Pennsylvania portion of Conowingo Pond, with the closest nest to the Peach Bottom site being on Little Bear Island, approximately 5 km (3 mi) upstream (Brauning and Peebles 2001). There are also approximately 6 nests between Conowingo Dam and the Maryland/Pennsylvania border (David Brinker, Md. DNR, Personal communication). The lower Susquehanna River is an important bald eagle area in Pennsylvania, and is one of the few areas in the state where eagles can be observed year round. Recent surveys indicate that as many as 10 to 15 eagles are in the vicinity of the Peach Bottom site during the summer breeding season and up to 20 birds over-winter in the vicinity of the Peach Bottom site (Brauning and Peebles 2001). In especially cold weather, as many as 15 to 20 birds at a time have been observed perched near the Peach Bottom Units 2 and 3 discharge canal, which may be the only nonfrozen part of the river.

The bog turtle is known to occur in York and Lancaster counties, Pennsylvania; Cecil County, Maryland; and New Castle County, Delaware. Exelon commissioned a survey for bog turtle habitat at the Peach Bottom site and along the Peach Bottom-to-Keeney transmission line (Tetra Tech 2000a). This survey conformed to accepted protocol for a Phase 1 survey as described in *Guidelines for Bog Turtle Surveys* (FWS 2000). No areas of suitable bog turtle habitat were identified during these surveys. Although the transmission line traverses a number of streams, most of these are incised channels through upland habitats, without adjacent bogs, swamps, or marshy meadows that constitute the required habitat for bog turtles.

The peregrine falcon was formerly listed as threatened by the FWS, but was removed from the list of endangered and threatened species in 1999 (FWS 1999). Status monitoring of this species will continue through at least 2004. Peregrines are very rare in the vicinity of the Peach

Bottom site and only one individual has been observed over-wintering on Conowingo Dam. A historic nest site is located several miles upstream from Peach Bottom site, but has not been occupied in over 100 years.[(a)]

One additional Federally listed species, the swamp pink (*Helonias bullata*) (Federal Threatened, Maryland Endangered, Delaware Conservation Concern) is known to occur in Cecil County, Maryland and New Castle County, Delaware. However, the known populations of swamp pink in these counties are all located along the fall line between the Piedmont and coastal plain ecoregions, which primarily lies south of Interstate 95 in Cecil County and these populations are not located near the Peach Bottom-to-Keeney transmission line.[(b)] The swamp pink was not observed during field surveys of the Peach Bottom-to-Keeney transmission line conducted by the Maryland Department of Natural Resources during the late 1980s or during subsequent evaluations (e.g., MDNR 1998).

The Peach Bottom-to-Keeney transmission line does not cross any Federal or State parks, wildlife refuges, or wildlife management areas. PECO cooperated with the Maryland Nature Conservancy to establish and protect two natural areas crossed by the Peach Bottom-to-Keeney transmission right-of-way. The 42-ha (103-ac) Rock Springs Powerline Natural Area is located near Rock Springs, Maryland, and the 22 ha (55-ac) Richardsmere Powerline Natural Area is located near Richardsmere, Maryland. Both of these natural areas are managed to protect rare plant species (Wiegland 1988a,b; MDNR 1998). The Peach Bottom-to-Keeney Transmission line occupies approximately 30% and 4.5% of the Rock Springs and Richardsmere Natural Areas, respectively.

The transmission line right-of-way is maintained by a combination of trimming, mowing, and application of approved herbicides (PECO 2000). Trees are trimmed on a 5-year cycle, with mowing conducted as needed. Herbicides are applied on a 3-year cycle and consist of both broadcast foliar and basal stem treatments. Certified applicators perform this work, and they primarily use non-restricted use herbicides. Hand cutting, instead of herbicide treatments, is generally used in wetlands. Sensitive areas (such as the Rock Springs and Richardsmere Powerline Natural Areas) are marked on maps carried by the maintenance field crews. The applicant supports an ongoing study to determine the effects of various right-of-way maintenance techniques on wildlife (Yahner et al. 2001).

(a) Personal communication with Dan Brauning, Pennsylvania Game Commission, November 15, 2001.
(b) Personal communication with David Brinker, Maryland Department of Natural Resources, November 30, 2001.

2.2.7 Radiological Impacts

Exelon has conducted a radiological environmental monitoring program (REMP) around the Peach Bottom site since 1974. Through this program, radiological impacts to workers, the public, and the environment are monitored, documented, and compared to the appropriate standards. The objective of the REMP is the following:

- Provide representative measurements of radiation and radioactive materials in the exposure pathways and of the radionuclides that have the highest potential for radiation exposures to members of the public.

- Supplement the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways.

Radiological releases are summarized in the annual reports titled *Annual Radiological Environmental Operating Report Peach Bottom Atomic Power Station Units 2 and 3* (Exelon 2001b) and *Radioactive Effluent Release Report* (Exelon 2001e). The limits for all radiological releases are specified in the Peach Bottom *Offsite Dose Calculation Manual*, and these limits are designed to meet Federal standards and requirements (PECO 2001a). The REMP includes monitoring of the aquatic environment (fish, invertebrates, and shoreline sediment), atmospheric environment (airborne radioiodine, gross beta, and gamma), terrestrial environment (vegetation), and direct radiation.

Review of historical data on releases and the resultant dose calculations revealed that the doses to maximally exposed individuals in the vicinity of Peach Bottom site were a small fraction of the limits specified in the EPA's environmental radiation standards 40 CFR Part 190 as required by 10 CFR 20.1301(d). For 2000, dose estimates were calculated based on actual liquid and gaseous effluent release data (Exelon 2001c). Calculations were performed using the plant effluent release data, onsite meteorological data, and appropriate pathways identified in the ODCM.

During 2000, Peach Bottom Units 2 and 3 did not release any strontium-90 or strontium-89 in the gaseous effluents. Liquid effluents containing radioactive materials, including strontium-90 and strontium-89 were released into the discharge canal. The only time that strontium was released in the liquid effluents was during the third and fourth quarters of 2000. In the third quarter a total of 5.4×10^{-1} MBq (1.46×10^{-5} Ci) of strontium-89 were released. In the fourth

quarter the effluents were: 4.3×10^{-3} MBq (1.16×10^{-7} Ci) of strontium-89 and 4.48×10^{-4} MBq (1.21×10^{-8} Ci) of strontium-90. The releases and average diluted concentrations were well below the NRC regulatory limits. The quantities of materials released in all effluents during 2000 are comparable to the quantities released in the past 5 years and is expected to remain similar during the license renewal period.

Exelon performs an assessment of radiation dose to the general public from radioactive effluents, assuming a person was located 400 m (1300 ft) east of the vents (on or near Conowingo Pond) for 10 hours a day, 5 days each week, for 50 weeks of the year, inhaling gaseous effluents from both Peach Bottom Units 2 and 3 (Exelon 2001c). For 2000, the total body dose to this hypothetical person from inhalation was estimated to be 1.08×10^{-3} mSv (1.08×10^{-1} mrem) or 0.02 percent of the annual limit of 5 mSv (500 mrem). For dose due to liquid effluents, Exelon assumes a person is located 460 m (1500 ft) below the discharge canal and stands on the bank of the Conowingo Pond for 67 days per year and is exposed to direct radiation from the cooling canal sediments, which have deposits of radioactive materials from the effluent releases from both Peach Bottom Units 2 and 3.

For 2000, the estimate of dose to a hypothetical person from this shoreline deposition was 3.41×10^{-5} mSv (3.41×10^{-3} mrem) or 0.06 percent of the annual limit of 6.0×10^{-2} mSv (6 mrem). Evaluation of doses from gaseous effluent releases from the two units for the same year resulted in an annual dose due to noble gases of 1.1×10^{-3} mGy (1.1×10^{-1} mrad) for gamma radiation and 6.32×10^{-4} mGy (6.32×10^{-2} mrad) from beta air dose. These are 0.50 percent and 0.16 percent, respectively, of the annual limits (see Section 2.1.4) (Exelon 2001c). These doses, which are representative of the doses from the past 5 years, demonstrate that the impact to the environment from radioactive releases from Peach Bottom Units 2 and 3 is SMALL.[(a)]

The applicant does not anticipate any significant changes to the radioactive effluent releases or exposures from Peach Bottom Units 2 and 3 operations during the renewal period; therefore, the impacts to the environment are not expected to change.

(a) The doses are very small fractions of the 40 CFR Part 190 limits, i.e., annual dose equivalent not to exceed 0.25 mSv (25 mrem) to the whole body, 0.75 mSv (75 mrem) to the thyroid, and 0.25 mSv (25 mrem) to any other organ of any member of the public.

2.2.8 Socioeconomic Factors

The staff reviewed the applicant's environmental report (ER) (Exelon 2001a) and information obtained from several county, city, and economic development staff during a site visit to York County from November 6 through 8, 2001. The following information describes the economy, population, and communities near the Peach Bottom site.

2.2.8.1 Housing

Approximately 1000 employees work at Peach Bottom Units 2 and 3 (about 275 contract employees and approximately 735 permanent employees). Approximately 35 percent of Exelon's employees live in York County, 30 percent live in Lancaster County, 13 percent live in Chester County (mostly on the western edge of the county), 10 percent live in Harford County, Maryland, and the rest live in other locations (see Table 2-2). Table 2-3 presents further breakdown of the residency, by city and county, of 735 permanent employees at Peach Bottom Units 2 and 3. Tables 2-2 and 2-3 do not contain the residences of the contract employees. Location information is not available for contractor employees, but the geographic distribution of their residences is assumed to be similar to that of the permanent employees. Given the predominance of Exelon employees living in York and Lancaster counties and the absence of the likelihood of significant socioeconomic effects in other locations, the focus of the analyses undertaken in this SEIS is on these two counties.

Table 2-2. Peach Bottom Units 2 and 3—Employee and Contract Employee Residence Information by County

County	Number of Personnel	Percent of Total Personnel
York County PA	260	35
Lancaster County PA	223	30
Chester County PA	99	13
Harford County MD	71	10
Subtotal	653	89
Total Permanent Employees	735	100
Contractor Employees	275	—
Total Plant Personnel	1010	—

Source: Exelon 2001d

Table 2-3. Peach Bottom Units 2 and 3—Permanent Employee Residence Information by County and City

County and City[(a)]	Number of Exelon Personnel	Percent of Exelon Personnel
YORK COUNTY, PA		
South Part of County		
Delta	46	6.3
Airville-Brogue area	38	5.2
Fawn Grove-New Park area	17	2.3
Felton	14	1.9
Stewartstown	10	1.4
Subtotal	125	17.0
North Part of County		
Red Lion	57	7.8
York, Dover, East York, West York	44	6.0
Dallas Town	20	2.7
Subtotal	121	16.5
Total Named Places	246	33.5
Total York County	260	35.4
LANCASTER COUNTY, PA		
South Part of County		
Quarryville	42	5.7
Pequea	14	1.9
Holtwood	11	1.5
Kirkwood	10	1.4
Subtotal	77	10.5
North Part of County		
Lancaster, Roherstown, Landisville, Salunga	48	6.5
Willow Street	33	4.5
Millersville	17	2.3
Subtotal	98	13.3
Named Places	175	23.8
Total Lancaster County	223	30.3

Table 2-3. (contd)

County and City[(a)]	Number of Exelon Personnel	Percent of Exelon Personnel
CHESTER COUNTY, PA		
Lincoln University	18	2.4
West Chester	12	1.6
Nottingham	11	1.5
Oxford	11	1.5
Total Named Places	52	7.1
Total Chester County	99	13.5
Harford County, MD		
Bel Air	25	3.4
Total Harford County	71	9.7
Other counties	82	11.2
Grand Total	735	100.0

(a) Addresses are for both townships (rural areas) and incorporated cities and towns. Only cities and towns with at least 10 employees are shown.
Source: Exelon 2001d

Exelon refuels each nuclear unit on a 24-month cycle, or about one refueling outage per year for the site. During these refueling outages, site employment increases by as many as 800 temporary workers for 30 to 40 days. Most of these temporary workers are assumed to be located in same geographic areas as the permanent Exelon staff.

Table 2-4 provides the number of housing units and housing unit vacancies for York and Lancaster counties for 1990 and 2000, the latest years for which information is available. Both York County and Lancaster County have urban development boundaries (UDBs) within which development is to take place, but otherwise do not have growth-management controls.

Table 2-4. Housing Units and Housing Units Vacant (Available) by County During 1990 and 2000

	1990	2000	Approximate Percentage Change 1990–2000
YORK COUNTY, PA			
Housing Units	134,761	156,720	16.3
Occupied Units %	95.5	94.6	-1.0
Vacant Units %	4.5	5.4	20.0
LANCASTER COUNTY, PA			
Housing Units	156,462	179,990	15.0
Occupied Units %	96.5	95.9	-0.6
Vacant Units %	3.5	4.1	17.1

(a) USCB 2001b, 2001c

2.2.8.2 Public Services

- **Water Supply**

In Pennsylvania, the counties do not operate public water supply systems. Local municipalities, authorities, and private water companies are subject to regulation under the Federal Safe Drinking Water Act and provide drinking water to residents who are not on individual wells. In York County, approximately 25 percent of the residents obtain drinking water from individual onsite wells or springs. York County has 320 water supply systems. Many of these systems are small, with 34 of the providers serving fewer than 100 people. The remaining systems range in size from the Railroad Borough system (serving approximately 320 people) to the York Water Company (serving over 140,000 people). The primary water sources for the larger systems in the county are surface water, while the smaller systems rely on groundwater.

There are over 200 permitted wells and springs used as water sources for water supply systems in York County (York County Planning Commission 1998). York County has projected water use through 2010 at roughly 180,000 m^3/day (48 million gpd). In 1996, the average daily use was approximately 120,000 m^3/day (32 million gpd).

Water systems in York County have been evaluated in the York County Water Supply Plan as to their ability to meet existing and projected water requirements for their respective service populations. These determinations provide the basis for recommended facility

improvements, cost estimating, and preparation of regional solutions by the planning commission. Determination has been made of systems' adequacy with regards to source, treatment, treated storage, and transmission/distribution capacities. Of the 80 community systems, 51 are considered adequate to meet existing maximum daily demand (MDD) and 44 are adequate to meet 2010 projected MDD. One system was deemed inadequate to meet treatment capacity for current MDD and eight were inadequate for 2010 MDD. These eight were also projected to experience source capacity problems. Only 36 of the 80 community systems provide adequate treated storage capacity for existing one-day distribution needs. These 36 are also projected to have adequate one-day storage capacity by the year 2010. Only 9 of the 43 mobile home park systems have adequate one-day distribution storage. Only four systems received adequate ratings under all pumping and piping criteria (York County Planning Commission 1998). The County found that all York County water systems are currently producing water that meets existing treatment requirements. Most systems, especially the large regional ones, are in good condition and many of the smaller ones are also adequate and viable to meet demand. For those systems in need of improvements, alternatives were evaluated and County-based solutions identified (York County Planning Commission 1998).

In Lancaster County, approximately 64 percent of the households are served by public water suppliers, while private on-lot water wells serve the remaining 36 percent. In 1993, approximately 2.2 percent of the County's population was served by one of 75 small water suppliers. Most residents receive their water from one of 34 large community water suppliers. Between 1986 and 1993, water supplied by these systems increased by 12 percent. Although these larger systems draw water from both ground and surface sources, they are increasingly dependent on groundwater to meet growing public demand. To meet these demands, large community water suppliers have completed major system improvements, drilled new wells, and extended service lines. In some cases, new authorities have been created and water systems have merged. Lancaster County has projected water use through 2010 at about 320,000 m^3/day (85 million gpd). In 1993, average daily consumption was 250,000 m^3/day (66 million gpd). An analysis by the County of the large community water suppliers indicates that approximately one-third have sufficient water to meet 2010 demands. One-third may lack sufficient water for this period, while the remaining systems have an excess supply. About half the systems with insufficient water could interconnect with other systems that have excess water. Others would probably need to find new water sources (Lancaster County 1997).

Both York and Lancaster counties anticipate water supply challenges in the future. According to the data, there will be shortages in some areas and excess supply in others. Future industries and residents will be encouraged to locate in areas with an adequate water supply infrastructure.

- **Education**

In October 2000, there were 16 school districts in York County with total enrollment of 67,000 students attending York County mainstream public schools. This represents an increase of approximately 1900 students since 1997 (Pennsylvania Department of Education 2001). The total enrollment in the 16 school districts in Lancaster County was 69,000, an increase of only about 100 since 1997 (Pennsylvania Department of Education 2001).

Although the region's school districts themselves do not keep track of Peach Bottom employee children, Table 2-5 shows the total average daily attendance for those school districts that likely serve most of these children.

There are 75 elementary schools (including primary learning centers) in York County. In October 2000, these schools (and some middle and intermediate schools with 5th and 6th graders) had an enrollment population of 36,260 in grades K-6 (Pennsylvania Department of Education 2001). The combined enrollment in the 98 elementary schools in Lancaster County, grades K-6, was 37,301 in October 2000 (Pennsylvania Department of Education 2001).

There are 20 junior high schools, intermediate schools, and middle schools in York County and 24 in Lancaster County. In October 2000, those in York County had an enrollment of 10,825 7th and 8th graders and Lancaster County had a total of 11,079 7th and 8th graders (Pennsylvania Department of Education 2001).

There are 19 senior high and technical high schools in York County and 23 in Lancaster County. In October, 2000, the enrollment in the York County schools numbered 19,941 students in grades 9-12 and 20,518 in Lancaster County (Pennsylvania Department of Education 2001)

Post-secondary education in York County is provided at Penn State University/ Commonwealth College, York College of Pennsylvania, and several technical schools, all in the city of York. Lancaster County has Millersville University of Pennsylvania in Millersville, Franklin and Marshall College and Harrisburg Area Community College/Lancaster Campus community college in Lancaster, Elizabethtown College in Elizabethtown, and several limited-purpose and technical schools in Lancaster (Pennsylvania Department of Education 2001).

Table 2-5. School Districts with Significant Numbers of Peach Bottom Site-Related Students

District	City	Current Average Daily Attendance
South Eastern	Delta	3163
Red Lion	Red Lion	5425
York City	York	7589
York Suburban	York	2654
West York Area	York	2999
Central York	York	4145
Lancaster City	Lancaster	11,203
Manheim Township	Lancaster	5011
Lampeter-Strasburg	Willow Street	3052
Penn-Manor	Millersville	5319
Conestoga Valley	Lancaster	3590
Solanco	Quarryville	4361
Oxford Area	Oxford, Nottingham	3165
West Chester Area	West Chester	11,609
Harford County	Bel Air	35,900

Source: Pennsylvania Department of Education 2001; Action Realty 2001; Harford County Public Schools 2002

- **Transportation**

York County is served by Interstate 83 (I-83), which enters the county from the north and ends in downtown Baltimore. The largest capacity highway in the immediate vicinity of the Peach Bottom site is Pennsylvania Highway 74, which is a north-south road. U.S. Highway 30 (U.S. 30) is the major east-west highway that traverses the middle of the county, about 20 miles to the northwest of the Peach Bottom site.

Road access to the Peach Bottom site is via State Route 2104 (Lay Road), which is a two-lane paved road. State Route 2104 (Lay Road) intersects State Route 2043 (Flintville Road) approximately two miles from the plant. Employees commuting to and from work generally use State Route 2104 (Lay Road), State Route 2024 (Paper Mill Road), State Route 2043 (Flintville Road), State Route 2026 (Atom Road), and State Route 2045 (Broad Street Extension), along with principal State Routes 74 and 372. State Route 372 crosses the Susquehanna River north of the Peach Bottom site, providing access to Lancaster County.

Flintville Road (which becomes Maryland State Route 623) connects with U.S. 1 in Maryland and is used by commuters from the south. While the Pennsylvania Department of Transportation does not compute level-of-service determinations on road capacities, local residents and Exelon employees agree that the area is extremely rural and there are no traffic-related issues.

Both York County and Lancaster County are well-served by Class I railroads, but there is no rail service to the Peach Bottom site.

2.2.8.3 Offsite Land Use

Within the Commonwealth of Pennsylvania, counties are the first subdivision of government below the state level and are further divided into municipalities, including cities, boroughs, and townships. Counties are required by the Commonwealth to prepare and adopt comprehensive plans. The area within 10 km (6 mi) of the Peach Bottom site includes parts of York and Lancaster counties in Pennsylvania, and sections of Harford and Cecil counties in Maryland. This section will focus on the Pennsylvania counties of York and Lancaster, because approximately 66 percent of the permanent Peach Bottom site workforce lives in these communities. In York County, there are 72 municipalities (including Peach Bottom Township where the Peach Bottom site is located), and in Lancaster County, there are 60. Both York and Lancaster counties have experienced significant growth in the last decade. The comprehensive plans of both counties share the goal of encouraging growth and development in identified areas. Prevention of suburban sprawl and the preservation of open space and farmland were goals identified as priorities in both plans. In York County, proposed growth areas are identified and development is promoted within the areas. New development beyond growth areas is directed to areas around existing boroughs and villages.

The York County Growth Management Map designates established and interim growth areas, as well as established rural areas. In Lancaster County, the designation of “Urban” and “Village Growth Boundaries” have been made to encourage growth around existing villages and urban areas and to prevent development sprawl into rural and agricultural areas. Delta Borough, with a population of 741 (Pennsylvania State Data Center 2000b) is the municipality nearest to the Peach Bottom site and is located southwest of the site. No major metropolitan areas occur within 10 km (6 mi) of the Peach Bottom site. However, one urban area (Baltimore Metropolitan Statistical Area) with a population of 100,000 or more is approximately 60 km (40 mi) southwest of the site (Exelon 2001a).

York County has a total land area of 236,049 ha (583,040 ac) with the predominant land use being agriculture (63.6 percent), followed by residential (20.5 percent). Lancaster County covers approximately 245,785 ha (607,360 ac), and, like York County, the predominant land use is agricultural (64.5 percent) with approximately 158,634 ha (392,000 ac) in agricultural land (Rural Pennsylvania 2001).

There are three hydroelectric facilities within 13 km (8 mi) of the Peach Bottom site. The Muddy Run Pumped Storage Hydroelectric Facility is approximately 8 km (5 mi) upstream on the east side of the Susquehanna River; the Holtwood Dam and Hydroelectric Facility is approximately 10 km (6 mi) upstream; and the Conowingo Dam and Hydroelectric Facility is approximately 13 km (8 mi) downstream in Maryland (Exelon 2001a).

No national parks or other Federally reserved areas have been identified within 10 km (6 mi) of the Peach Bottom site; however, two protection areas for management of rare plant species were established by PECO in cooperation with the Maryland Nature Conservancy. The Rock Spring Powerline Natural Area is a 42-ha (103-ac) parcel approximately 11 km (7 mi) southeast of the site near Rock Springs, Maryland, and the Richardsmere Powerline Natural Area near Richardsmere, Maryland is a 22-ha (55-ac) parcel approximately 16 km (10 mi) southeast of the Peach Bottom site (Exelon 2001a).

2.2.8.4 Visual Aesthetics and Noise

The Peach Bottom units, including Units 2 and 3 and supporting structures, can be seen and heard from the Conowingo Pond itself, from the public access boat ramp and picnic areas immediately upstream of the plant, and from private residences along the shores of Conowingo Pond. The most visible features of the Peach Bottom site structures are the emission stacks from Units 2 and 3, the containment structures, cooling towers, and intake screens. Cliffs rising on the west side of Conowingo Pond, trees, and vegetation shield the main plant structures from view from the west, although the stack and meteorological tower are tall enough to be seen from public roads and rural residences. The Peach Bottom Plant is also visible from the Conowingo Pond at night because of outside lighting used at the Peach Bottom site and lighting used on the Units 2 and 3 emission stack and the meteorological tower. There is no visible vapor plume from Units 2 and 3 operations because the cooling towers are not normally used.

Noise from the Peach Bottom Units 2 and 3 is noticeable by users of the Conowingo Pond and facilities upstream of the plant. Noise transmission across Conowingo Pond is facilitated by the lack of barriers on the pond. Cliffs, vegetation, and trees largely screen residents living to the west from noise generated by the plant.

2.2.8.5 Demography

Population was estimated from the Peach Bottom site out to a distance of 80 km (50 mi).

Exelon used 1990 census data from the U.S. Census Bureau website (USCB 1999) and geographic information system software (ArcView®) to determine demographic characteristics in the vicinity of the Peach Bottom site. NRC guidance calls for the use of the most recent USCB

decennial census data, which in the case of the Peach Bottom site, was the 2000 census (USCB 2001a). The Census Bureau provides updated annual projections, in addition to decennial data, for selected portions of its demographic information. Section 2.11 (Minority and Low-Income Populations) of the environmental report used 1990 minority and low-income population demographic information, because updated projections were not available by census tract. Exelon chose to also use 1990 data in discussing total population, so that the data sets would be consistent throughout its site environmental report. The NRC staff used 2000 census data in this section and in discussing minority populations.

As derived from Census Bureau 2000 information, at least 452,400 people live within 32 km (20 mi) of the Peach Bottom site. Applying the GEIS sparseness measures, Peach Bottom site has a population density of 139 persons/km^2 (360 persons/mi^2) within 32 km (20 mi) and falls into the least sparse category, Category 4 (having greater than or equal to 46 persons/km^2 [120 persons/mi^2] within 32 km [20 mi]). As estimated from Census Bureau 2000 information, at least 5,270,600 people live within 80 km (50 mi) of the Peach Bottom site. This equates to a population density of 258 persons/km^2 (671 persons/mi^2) within 80 km (50 mi). Applying the GEIS proximity measures, the Peach Bottom site is classified as being "in close proximity," Category 4 (having greater than or equal to 73 persons/km^2 [190 persons/mi^2] within 80 km [50 mi]). According to the GEIS sparseness and proximity matrix, Peach Bottom site ranks of sparseness Category 4 and proximity Category 4 result in the conclusion that the Peach Bottom site is located in a high population area. All or parts of 24 counties are located within 80 km (50 mi) of the Peach Bottom site (Figure 2-1). Of the counties, 10 are in Pennsylvania, 10 are in Maryland, 2 are in Delaware, and 2 are in New Jersey. The Baltimore Metropolitan Statistical area is the largest metropolitan area within 80 km (50 mi) of the Peach Bottom site. Other sizable cities and towns (within 80 km [50 mi]) include Reading, Harrisburg, Chester, Lancaster, and York, Pennsylvania, and Wilmington, Delaware (Environmental Systems Research Institute Undated). Approximately 66 percent of Peach Bottom site employees live in Lancaster and York counties. The remaining 34 percent is distributed across 18 counties, with numbers ranging from 1 to 99 people. The towns of Red Lion, Delta, Lancaster, Quarryville, and York have the highest numbers of employees in residence, with 7.8, 6.3, 6.0, 5.7, and 5.2 percent, respectively.

Both Lancaster and York counties' populations are growing at faster rates than those of the Commonwealth of Pennsylvania as a whole. Between 1980 and 1990, the Commonwealth's population increased by 0.1 percent, while Lancaster and York counties increased by 17 and 9 percent, respectively. The Commonwealth of Pennsylvania as a whole is projected by the Census Bureau to have the second smallest (5 percent) population increase of all 50 States during the period from 1995 to 2025 (USCB 1997). Projections for the period from 2000 through 2020 show Lancaster and York counties surpassing the Commonwealth's growth rate with population increases of 23 and 9 percent, respectively.

The larger towns nearby the Peach Bottom site include York, 48 km (30 mi) to the northwest; Red Lion, 32 km (20 mi) to the northwest; Quarryville, 16 km (10 mi) to the northeast; and Lancaster, 31 km (19 mi) due north. Between 1990 and 2000, York County experienced a population growth from 339,600 (in 1990) to 381,800 (in 2000), a 12.4 percent increase over the decade (USCB 2001a), while Lancaster County grew from 422,800 to 470,700, an increase of 11.3 percent. The greatest relative population growth within the 80-km (50-mi) radius around the Peach Bottom site between 1990 and 2000 occurred in Carroll County, Maryland, northwest of Baltimore (22.3 percent).

Table 2-6 shows estimated populations and annual growth rates for the two counties with the greatest potential to be affected by license renewal activities.

Table 2-6. Regional Demographies

	Population and Average Annual Growth Rate (as a Percent) during the Previous Decade			
	Lancaster County		York County	
Year	Number	Percent	Number	Percent
1980[a]	362,346	1.3	312,963	1.5
1990[a]	422,822	1.7	339,574	0.9
2000[b]	486,046	1.5	382,047	1.3
2010[b]	540,823	1.1	403,133	0.6
2020[b]	597,975	1.1	415,934	0.3
2030[c]	655,832	0.9	442,813	0.6
2035[c]	684,004	0.9	452,392	0.4

(a) USCB 1995
(b) Pennsylvania State Data Center 2000a
(c) Tetra Tech NUS 2000b

- **Resident Population Within 80 km (50 mi)**

  Table 2-7 presents the population distribution within 80 km (50 mi) of the Peach Bottom site for the year 2000.

Table 2-7. Population Distribution within 80 km (50 mi) of the Peach Bottom Site

0 to 16 km (0 to 10 mi)	16 to 32 km (10 to 20 mi)	32 to 48 km (20 to 30 mi)	48 to 64 km (30 to 40 mi)	64 to 80 km (40 to 50 mi)	Total
43,879	408,481	873,103	2,028,471	1,916,694	5,270,628

Source: USCB 2001a

The population centers within the 16-km (10-mi) area are the town of Delta, Peach Bottom Township, Drumore Township (Drumore), and Fulton Township (Wakefield). The populations of these settlements in the year 2000 were 741, 4412, 2114, and 2688, respectively. Most of the new residential development within the 16-km (10-mi) radius has been in Peach Bottom Township, west of the Peach Bottom site, and south of the Pennsylvania/Maryland border in Harford County.

The county planning departments for York and Lancaster counties project relatively low population growth for Peach Bottom Township in York County, Drumore and Fulton Townships and nearby areas. This area has relatively less growth than other parts of the two counties. There are several residential developments that have started in the vicinity of York, Shewsbury Township, Hanover/Penn, and Fairview/Newberry areas (York County Planning Commission 1995, 1997).

- **Transient Population**

The transient population in the vicinity of the Peach Bottom site can be identified as daily or seasonal. Daily transients are associated with places where a large number of people gather regularly, such as local businesses, industrial facilities, and schools. Table 2-8 presents information on the major employers and number of employees for facilities located within 16 km (10 mi) of the Peach Bottom site.

Seasonal transients result from part-time residents who may reside in southern Pennsylvania during the summer tourist season or pursue recreational activities there throughout the year. Lancaster County, for example, claims 5 million tourists per year. (York County does not have a comparable estimate of the number of visitors. The 1999 Pennsylvania Economic Impact Report [D. K. Shifflet and Associates 2000] estimates visitor spending in York County at $774 million, compared with $1357 million in Lancaster County, indicating about 57 percent as much activity in York County). Conowingo Pond is regularly used for bass fishing tournaments in the spring, summer, and fall. The heated discharge at the Peach Bottom site, which attracts baitfish and game fish in most months of the year, is an especially popular fishing spot in winter. Susquehannock State Park, across the Susquehanna River and upstream from the Peach Bottom site, has drawn nearly 97,000 visitors per year during

the years 1999 and 2000.[a]

Table 2-8. Major Employment Facilities Within 16 km (10 mi) of the Peach Bottom Site

Firm	Number of Employees
Cecil County	
Fawn Grove Manufacturing Company	100
H.E. Shallcross and Sons	35
Harford County	
Blue Ridge Flooring Company	65
C.D. Miller	NA
Maryland Green Marble Corporation	16
Maryland Lava Company	70
Miller Chemical and Fertilizer Corporation	21
McMorquodale Color Card Company	22
Maryland Ceramic and Steatite Company	45
Whitefore Packing Company	150
Petti Frocks, Inc., Assoc.	84
R. Roberts and Son	20
B.G.S. Jourdan & Sons	55
The Susquehanna Electric Company	65
York County	
Weldon Packing Company	NA
Snyder Packing Company	100
PECO Energy	64
South Eastern School District (Fawn Grove)	281
Lancaster County	
Pennsylvania Power & Light Company	150

Source: Table 2.2.12 in Peach Bottom Atomic Power Station, Final Safety Analysis Report (PECO 2001b) (table updated January 1994)
NA = not available

(a) Telephone contact with staff at Gifford Pinchot State Park in Lewisberry, Pennsylvania, January 31, 2002. (Gifford Pinchot staff manage information on Susquehannock State Park.)

- **Agricultural Labor**

  There are 2200 farms in York County and 5910 in Lancaster County (Pennsylvania Agricultural Statistics Service 2001). The main agricultural products within the 80-km (50-mi) radius of the Peach Bottom site are livestock and dairy, corn, and hay. As a result, around 5900 hired farm workers are present at some time during the year in Lancaster County (about 3800 for less than 150 days per year) and 2200 in York County (1700 for less than 150 days per year) (USDA 1997a, 1997b). Both counties are entirely within the 80-km (50-mi) circle. Almost all of the laborers on farms in the area are believed to be resident in the area. Migrant labor plays little or no role.

2.2.8.6 Economy

Both Lancaster County and York County have experienced steady growth in population and economic activity during the last decade. Both counties are designated as metropolitan statistical areas, ranking 89th and 108th of the 276 metropolitan statistical areas in the country in 2000 (USCB 2001d), with populations of approximately 423,800 and 339,600, respectively. Both counties are located in south-central Pennsylvania, on the western edge of the highly urbanized and industrial region extending from Boston, Massachusetts, to Washington, DC. Both counties have ready access to domestic and international markets, with a transportation network consisting of interstate highway access to major north-south and east-west routes, trucking and rail terminals, two international airports, and two international ports (EDC 2000b, Lancaster Chamber of Commerce and Industry 2000, YCEDC 2000).

Historically, both Lancaster and York counties' economies were deeply rooted in agriculture. In recent years, both counties have become more economically diversified. In Lancaster County, services is now the largest employment sector (26 percent of the labor force) (Lancaster Chamber of Commerce and Industry 2000), with health services as the leading employment group, closely followed by the eating and drinking establishments group (EDC 2000a). The manufacturing sector employs 25.3 percent of the labor force (Lancaster Chamber of Commerce and Industry 2000), with the "production of food and related products" as the major employment group within this category (EDC 2000a). Lancaster County has the distinction of being the most productive non-irrigated farming county in the United States, with total agricultural receipts of $938 million annually (EDC 2000a). In York County, the manufacturing sector leads employment with 29 percent, followed by services at 23.4 percent (York County Chamber of Commerce and Visitors Bureau, Pennsylvania 2000). There are more than 1000 manufacturing companies that employ nearly 53,000 people (YCEDC 2000), with the industrial machinery and equipment industry group in the lead. The health services industry employs the greatest number of the services' sector groups (Pennsylvania Labor Market Information Database System 2000a).

The 1999 unemployment rate for the Commonwealth of Pennsylvania was 4.4 percent. In comparison, Lancaster and York counties had 1999 unemployment rates of 2.7 and 3.6 percent, respectively (Pennsylvania Labor Market Information Database System 2000b).

The Peach Bottom Atomic Power Station thus is an important employer, but by no means the most important economic entity in York and Lancaster counties. It ranks 21st on the list of York County's top 100 employers, and employs 1.3% of the 60,000-plus employees working for those 100 employers.

County planning officials expect the future area of growth for York County to be in the north end of the county. The southeast part of the county is expected to remain largely rural because it is largely undeveloped, has relatively little infrastructure and few major highways, and has strong desires for agricultural preservation.

Population in Lancaster County (moderate growth forecast) is projected to increase from approximately 423,000 (1990) to around 684,000 (2035), or approximately 62 percent over the 45-year period. York County population is projected to increase from approximately 340,000 (1990) to around 452,000 (2035), or approximately 33 percent (see Table 2-6).

Exelon is a significant property taxpayer in York County. Until recently, however, all tax payments went to the Commonwealth of Pennsylvania and then were distributed back to local government units by formula. The year 2000 is the first year when taxes were paid directly to local governments.

In the past, PECO paid property taxes to the Commonwealth of Pennsylvania on its generating, transmission, and distribution facilities. Under authority of the Pennsylvania Utility Realty Tax Act (PURTA), property taxes collected from all utilities (water, telephone, electric companies, railroads, etc.) were redistributed to the taxing entities within the Commonwealth. In Pennsylvania, these entities include the counties, cities, townships, boroughs, and school districts. The distribution of PURTA funds is determined by a formula, and is not necessarily based on the individual utility's effect on a particular government entity. PURTA distributions, along with other revenue sources such as residential property taxes and assessments, fund operations of various government entities. In York County, for example, funds from these revenue sources, including PURTA distributions, are used for the Court of Common Pleas, county parks, county corrections facilities, the county nursing home, maintenance of the county real estate appraisal program, and voter registration files (Noll 2000a). Peach Bottom Township uses revenue funds, including PURTA distributions, to maintain township roads, operate and maintain sewage treatment facilities, develop and implement planning and zoning regulations, and issue building permits (Baldwin 2000).

Table 2-9 lists annual budget figures for York County, Peach Bottom Township, and the South Eastern School District (in York County) for the years 1996 through 2000. Exelon determined that past tax information would not provide the best assessment of the Peach Bottom site's impact for two reasons. First, there has been no direct correlation between the taxes paid by a utility to PURTA and the PURTA allocation to the taxing entities. A number of other variables were factored into the PURTA decision-making process when allocating funds to various taxing authorities. Second, PURTA taxes were based on depreciated book value; realty taxes now will be based on assessed value. For these reasons, past revenues are not necessarily a good measure of future property tax payments to a county (or other taxing authority).

Table 2-9. Local Government Budgets and Projected Taxes for Peach Bottom Units 2 and 3

Year	Annual Budget for York County[(a)]	Annual Budget for Peach Bottom Township[(b)]	Annual Budget for South Eastern School District[(b)]
1996	$156,503,053	unavailable	$18,508,364
1997	$163,833,299	$1,214,435	$19,420,951
1998	$182,894,802	$1,315,494	$20,314,174
1999	$205,933,243	$1,355,026	$21,772,021
2000	$205,907,177	$1,690,094	$23,330,009
Estimated Year 2000 Peach Bottom property taxes (% of 2000 Budgets)	$151,000 (0.07%)	$30,000 (1.8%)	$840,000 (3.6%) plus $420,000 subject to possible refund (1.8%)

(a) Baldwin 2000
(b) Noll 2000b

Pennsylvania recently changed the basis for calculating PURTA taxes for tax year 1998 and beyond from the utilities' depreciated book value to the local taxing authority's assessed value. In addition, effective January 1, 2000, generating facilities are no longer included in the realty taxes paid to the Commonwealth under PURTA. Power generating companies will now be required to pay realty taxes on these facilities directly to the county, township, and school district in which they are located. Distribution and transmission facilities will remain taxable under PURTA. The amounts of property taxes to be paid by Exelon for the Peach Bottom site to York County, Peach Bottom Township, and the Southeastern School District have not yet been determined. Until a determination is made, Exelon agreed to pay York County $151,000 per year, beginning in 2000; Peach Bottom Township $30,000 per year, beginning in 2000; and the

Southeastern School District $840,000 per year, beginning in 2000. These funds are non-refundable. In addition, Exelon will pay the school district $420,000 per year, beginning in 2000, that could be refunded, pending the final determination. These figures would constitute a small portion of the operating budgets of the three local government units affected.

2.2.9 Historic and Archaeological Resources

This section discusses the cultural background and the known historic and archaeological resources at the Peach Bottom site and in the surrounding area.

2.2.9.1 Cultural Background

The region around the Peach Bottom site is rich in prehistoric and historic Native American and EuroAmerican cultural resources including over 350 National Register of Historic Places property listings in three counties surrounding the Peach Bottom site (Exelon 2001a). Known examples of older prehistoric sites are rare but Native American archaeological sites that date after 4000 BC are fairly common in the area. The majority of recorded prehistoric archaeological sites were found within the first terraces above the Susquehanna River. In the vicinity of the Peach Bottom site, these terraces are under waters of the Conowingo Pond (which was formed when Conowingo Dam was constructed across the Susquehanna River in 1928) or not present at all within the steeply sloped and modified terrain.

The lower reaches of the Susquehanna River encompass one of the areas in North America longest settled by Europeans. Their occupation began in the Seventeenth Century. Just downstream from Conowingo Pond, the remains of the Susquehanna and Tidewater Canal (1840) are still visible and there are the archaeological remains of Lapidum, a settlement destroyed by the British in the War of 1812.

Early contact with European colonists and events associated with that contact make it difficult to associate present-day tribal groups with the territory in the vicinity of the Peach Bottom site. The contacts led to tribal movements, alliances with either the French or English, armed conflicts, epidemics, shifting inter-tribal confederacies, and eventual removal, or extinction in some cases, as the European expansion took place. The contacts took place so early that the record provides a poor basis for inferences concerning the owners of the land at the time the colonists arrived.

For the Peach Bottom site, the original occupants of the Susquehanna River valley were the Susquehannocks, a confederacy of at least five tribes with more than 20 villages. Adjacent to the Susquehannocks were the Shawnee to the west in Pennsylvania; the Delaware (also known as Lenni-Lenape, as well as the closely related Nanticoke) in southeastern Pennsylvania, New Jersey and Delaware; and the Piscataway (also Canoy) to the south in Maryland. The

Susquehannocks suffered the most as a culture and were nearly gone by the early 1700s; by 1763 they were essentially extinct although many remaining individuals had moved to other tribes. Along with the decline of the Susquehannock, other tribes moved into the Susquehanna River valley, including the Shawnee and the Piscataway who spread northward along the river, establishing a town at the mouth of Canoy Creek in 1718 (near present day Bainbridge upriver from Peach Bottom).

A series of treaties beginning in the 1750s and continuing for the next two or three decades effectively removed tribal entities from the region. The Delaware and Shawnee primarily moved first to the Ohio River Valley and then to Oklahoma and Kansas, respectively, where they exist today.

Today, there are no Federally recognized Indian tribes in Pennsylvania, New Jersey, Delaware, or Maryland. There are three State-recognized remnant groups of the Lenni-Lenape and Nanticoke, and there are two remnant groups of Piscataway who have petitioned the State of Maryland for recognition. Among the reasons the Piscataway desire at least State recognition involves repatriation of nearly 500 Piscataway burials currently held by the Maryland Historical Trust and Smithsonian Institution. One of the Piscataway groups is known as the "Piscataway-Canoy Confederation," a name that at least connotes a historical relationship to the Susquehanna River valley in southern Pennsylvania. Today, the Piscataway (numbering nearly 25,000 individuals) live primarily in southern Maryland.

2.2.9.2 Historic and Archaeological Resources at Peach Bottom Site

In 1972, I. F. Smith, an archaeologist from the William Penn Museum, conducted an evaluation of the Peach Bottom property. Although the extent and methodology of his efforts were limited, the archaeologist concluded that there were no archaeological sites in the areas of Units 2 and 3, and that likely areas for discovery of archaeological resources were no longer intact at the time of his visit (Smith 1972a). Smith stated:

> …it is the flood plain and terrace that are the most likely areas to find Indian settlements and these are obviously no longer susceptible to investigation at Peach Bottom because they have either been built upon in the past or flooded by the backwaters of Conowingo Dam. (Smith 1972b: USAEC 1973)

No historic architectural, historic landscape, traditional cultural property, or archaeological sites have been recorded on the Peach Bottom site (Exelon 2001a). The applicant's environmental report indicates that no artifacts have ever been found within the Peach Bottom site boundary (Exelon 2001a). The staff did not conduct further historic and archaeological site file searches at record repositories in Pennsylvania, Maryland, and Delaware.

The utility right-of-way that includes the Peach Bottom-to-Keeney, Delaware transmission line crosses part of a feeder canal for the Chesapeake and Delaware Canal system (Delaware SHPO 2001). This feeder canal was dug in the early 1800s but never used for its intended purpose to transport agricultural goods (Guider 1974). Completion of a rail line in 1826 eliminated the need for the canal. The Delaware State Historic Preservation Office recognizes the feeder canal as historically important: it is a rare remnant of the mostly altered canal system and it reflects canal construction techniques of the early Nineteenth Century (Delaware SHPO 2001).

The utility right-of-way at the intersection with the feeder canal is approximately 122 m (400 ft) wide. The right-of-way was in place before the Peach Bottom line was added and it presently includes three other overhead transmission lines and at least one underground utility easement. The right-of-way is clear of trees, but grass and brush covered. A gravel surfaced utility road meanders through the right-of-way and crosses the remnant trench for the feeder canal underneath the Peach Bottom line.

The old feeder canal alignment remains a visible and well-defined feature along much of its original route through present-day woodlands. It displays less definition and more in-filling as it passes under the transmission right-of-way. The changes under the transmission right-of-way are cumulative effects from a range of human and natural activities that extend back in time to a period well before the addition of the Peach Bottom-to-Keeney, Delaware transmission line to the utility right-of-way.

The New Castle County Natural Resources Conservation Service has aerial photographs of the area of concern in its files. These photographs date to 1937, 1946, 1954, 1961, 1968, 1977, 1982, 1988/89, and 1998. Staff review of these aerial photographs indicates that the feeder canal remained relatively intact until after 1968. At that time, and before 1977, small noticeable changes began to occur: first, a utility road crossed the feeder canal at a new place in the transmission right-of-way and below the present-day Peach Bottom-to-Keeney, Delaware transmission line. Second, a series of accumulative changes began, which continue to the present, resulting in gradual loss of vegetation along the alignment of the canal and a progressive loss of sharpness in the features of the canal as viewed from the air. The loss of distinct edges of the feeder canal may also occur in the wooded areas.

2.2.10 Related Federal Project Activities and Consultations

The staff reviewed the possibility that activities of other Federal agencies might impact the renewal of the OL for Peach Bottom Units 2 and 3. Any such activities could result in cumulative environmental impacts and the possible need for the Federal agency to become a cooperating agency for preparation of the SEIS.

NRC is required under Section 102 of the NEPA to consult with and obtain the comments of any Federal agency that has jurisdiction by law or special expertise with respect to any environmental impact involved. NRC consulted with the FWS. Consultation correspondence is included in Appendix E.

2.3 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20, "Standards for Protection Against Radiation."

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

10 CFR Part 61. Code of Federal Regulations, Title 10, *Energy,* Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

10 CFR Part 71. Code of Federal Regulations, Title 10, *Energy,* Part 71, "Packaging and Transportation of Radioactive Material."

40 CFR Part 81. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 81, "Designation of Areas for Air Quality Planning Purposes." Available at: http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi . Accessed December 14, 2001.

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3.0 Environmental Impacts of Refurbishment

Environmental issues associated with refurbishment activities are discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).[(a)] The GEIS includes a determination of whether the analysis of the environmental issues could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria for Category 1 and, therefore, additional plant-specific review of these issues is required.

License renewal actions may require refurbishment activities for the extended plant life. These actions may have an impact on the environment that requires evaluation, depending on the type of action and the plant-specific design. Environmental issues associated with refurbishment that were determined to be Category 1 issues are listed in Table 3-1.

Environmental issues related to refurbishment considered in the GEIS for which these conclusions could not be reached for all plants, or for specific classes of plants, are Category 2 issues. These are listed in Table 3-2.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table 3-1. Category 1 Issues for Refurbishment Evaluation

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
SURFACE-WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)	
Impacts of refurbishment on surface-water quality	3.4.1
Impacts of refurbishment on surface-water use	3.4.1
AQUATIC ECOLOGY (FOR ALL PLANTS)	
Refurbishment	3.5
GROUNDWATER USE AND QUALITY	
Impacts of refurbishment on groundwater use and quality	3.4.2
LAND USE	
Onsite land use	3.2
HUMAN HEALTH	
Radiation exposures to the public during refurbishment	3.8.1
Occupational radiation exposures during refurbishment	3.8.2
SOCIOECONOMICS	
Public services: public safety, social services, and tourism and recreation	3.7.4; 3.7.4.3; 3.7.4.4; 3.7.4.6
Aesthetic impacts (refurbishment)	3.7.8

Table 3-2. Category 2 Issues for Refurbishment Evaluation

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53 (c)(3)(ii) Subparagraph
TERRESTRIAL RESOURCES		
Refurbishment impacts	3.6	E
THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS)		
Threatened or endangered species	3.9	E
AIR QUALITY		
Air quality during refurbishment (nonattainment and maintenance areas)	3.3	F
SOCIOECONOMICS		
Housing impacts	3.7.2	I
Public services: public utilities	3.7.4.5	I
Public services: education (refurbishment)	3.7.4.1	I
Offsite land use (refurbishment)	3.7.5	I
Public services, transportation	3.7.4.2	J
Historic and archaeological resources	3.7.7	K
ENVIRONMENTAL JUSTICE		
Environmental justice	Not addressed[(a)]	Not addressed[(a)]

(a) Guidance related to environmental justice was not in place at the time the GEIS and the associated revision to 10 CFR Part 51 were prepared. If a licensee plans to undertake refurbishment activities for license renewal, environmental justice must be addressed in the licensee's environmental report and the staff's environmental impact statement.

Category 1 and Category 2 issues related to refurbishment that are not applicable to Peach Bottom because they are related to plant design features or site characteristics not found at Peach Bottom are listed in Appendix F.

The potential environmental effects of refurbishment actions would be identified, and the analysis would be summarized within this section, if such actions were planned. Exelon Generation Company, LLC (Exelon) indicated that it has performed an evaluation of structures and components pursuant to 10 CFR 54.21 to identify activities that are necessary to continue

operation of Peach Bottom Units 2 and 3 during the requested 20-year period of extended operation. These activities include replacement of certain components as well as new inspection activities and are described in the Environmental Report (ER; Exelon 2001).

However, Exelon stated that the replacement of these components and the additional inspection activities are within the bounds of normal plant component replacement and inspections; therefore, they are not expected to affect the environment outside the bounds of plant operations as evaluated in the final environmental statement (AEC 1973). In addition, Exelon's evaluation of structures and components as required by 10 CFR 54.21 did not identify any major plant refurbishment activities or modifications necessary to support the continued operation of Peach Bottom Units 2 and 3 beyond the end of the existing operating licenses. Therefore, refurbishment is not considered in this Supplemental Environmental Impact Statement.

3.1 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

Exelon Generation Company, LLC (Exelon). 2001. *Applicant's Environmental Report – Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

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4.0 Environmental Impacts of Operation

Environmental issues associated with operation of a nuclear power plant during the renewal term are discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).[(a)] The GEIS includes a determination of whether the analysis of the environmental issues could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria for Category 1, and therefore, additional plant-specific review of these issues is required.

This chapter addresses the issues related to operation during the renewal term that are listed in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, and are applicable to the Peach Bottom Units 2 and 3. Section 4.1 addresses issues applicable to the cooling system. Section 4.2 addresses issues related to transmission lines and on-site land use. Section 4.3 addresses the radiological impacts of normal operation. Section 4.4 addresses issues related to the socioeconomic impacts of normal operation during the renewal term. Section 4.5 addresses issues related to groundwater use and quality. Section 4.6 discusses the impacts of renewal-term operations on threatened and endangered species. Section 4.7 addresses new information that was raised during the scoping period. The results of the evaluation of environmental issues related to operation during the renewal term are summarized in

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Section 4.8. Finally, Section 4.9 lists the references for Chapter 4. Category 1 and Category 2 issues that are not applicable to Peach Bottom Units 2 and 3 because they are related to plant design features or site characteristics not found at the Peach Bottom site are listed in Appendix F.

4.1 Cooling System

Category 1 issues in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, that are applicable to Peach Bottom Units 2 and 3 cooling system operation during the renewal term are listed in Table 4-1. Exelon stated in its Environmental Report (ER; Exelon 2001a) that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 operating licenses (OLs). The staff has not identified any significant new information during its independent review of the Exelon ER (Exelon 2001a), the staff's site visit, scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of the issues, the GEIS concluded that the impacts are SMALL, and additional plant-specific mitigation measures beyond those already in place at Peach Bottom Units 2 and 3 are not likely to be sufficiently beneficial to be warranted.

Table 4-1. Category 1 Issues Applicable to the Operation of the Peach Bottom Units 2 and 3 Cooling System During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)	
Altered current patterns at intake and discharge structures	4.2.1.2.1
Altered thermal stratification of lakes	4.2.1.2.3; 4.3.2.2
Temperature effects on sediment transport capacity	4.2.4.2.3; 4.3.2.2
Scouring caused by discharged cooling water	4.2.1.2.3
Eutrophication	4.2.1.2.3
Discharge of chlorine or other biocides	4.2.1.2.4; 4.3.2.2
Discharge of sanitary wastes and minor chemical spills	4.2.1.2.4; 4.3.2.2
Discharge of other metals in wastewater	4.2.1.2.4; 4.3.2.2
Water use conflicts (plants with once-through cooling systems)	4.2.1.3; 4.3.2.1

Table 4-1. (contd)

AQUATIC ECOLOGY (FOR ALL PLANTS)	
Accumulation of contaminants in sediments or biota	4.2.1.2.4; 4.3.3; 4.4.3; 4.4.2.2
Entrainment of phytoplankton and zooplankton	4.2.2.1.1; 4.3.3; 4.4.3
Cold shock	4.2.2.1.5; 4.3.3; 4.4.3
Thermal plume barrier to migrating fish	4.2.2.1.6; 4.4.3
Distribution of aquatic organisms	4.2.2.1.6; 4.4.3
Premature emergence of aquatic insects	4.2.2.1.7; 4.4.3
Gas supersaturation (gas bubble disease)	4.2.2.1.8; 4.4.3
Low dissolved oxygen in the discharge	4.2.2.1.9; 4.3.3; 4.4.3
Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses	4.2.2.1.10; 4.4.3
Stimulation of nuisance organisms	4.2.2.1.11; 4.4.3
TERRESTRIAL RESOURCES	
Cooling tower impacts on crops and ornamental vegetation	4.3.4
Cooling tower impacts on native plants	4.3.5.1
Bird collisions with cooling towers	4.3.5.2
HUMAN HEALTH	
Microbiological organisms (occupational health)	4.3.6
Noise	4.3.7

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Altered current patterns at intake and discharge structures. Based on information in the GEIS, the Commission found that

  > Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of altered current patterns at intake and discharge structures during the renewal term beyond those discussed in the GEIS.

- Altered thermal stratification of lakes. Based on information in the GEIS, the Commission found that

  > Generally, lake stratification has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of altered thermal stratification of lakes during the renewal term beyond those discussed in the GEIS.

- Temperature effects on sediment transport capacity. Based on information in the GEIS, the Commission found that

  > These effects have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of temperature effects on sediment transport capacity during the renewal term beyond those discussed in the GEIS.

- Scouring caused by discharged cooling water. Based on information in the GEIS, the Commission found that

  > Scouring has not been found to be a problem at most operating nuclear power plants and has caused only localized effects at a few plants. It is not expected to be a problem during the license renewal term.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of scouring caused by discharged cooling water during the renewal term beyond those discussed in the GEIS.

- Eutrophication. Based on information in the GEIS, the Commission found that

  > Eutrophication has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information including plant monitoring data and technical reports. Therefore, the staff concludes that there are no impacts of eutrophication during the renewal term beyond those discussed in the GEIS.

- Discharge of chlorine or other biocides. Based on information in the GEIS, the Commission found that

  > Effects are not a concern among regulatory and resource agencies, and are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information including the National Pollutant Discharge Elimination System (NPDES) permit for the Peach Bottom site (PDEP 2000), plant monitoring data and technical reports. Therefore, the staff concludes that there are no impacts of discharge of chlorine or other biocides during the renewal term beyond those discussed in the GEIS.

- Discharge of sanitary wastes and minor chemical spills. Based on information in the GEIS, the Commission found that

  > Effects are readily controlled through the NPDES permit (PDEP 2000) and periodic modifications, if needed, and are not expected to be a problem during the license renewal term.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information including the NPDES permit for the Peach Bottom site (PDEP 2000), plant monitoring data and technical reports. Therefore, the staff concludes that there are no impacts of discharges of sanitary wastes and minor chemical spills during the renewal term beyond those discussed in the GEIS.

- Discharge of other metals in wastewater. Based on information in the GEIS, the Commission found that

  > These discharges have not been found to be a problem at operating nuclear power plants with cooling-tower-based heat dissipation systems and have been satisfactorily mitigated at other plants. They are not expected to be a problem during the license renewal term.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information including the NPDES permit for the Peach Bottom site (PDEP 2000), plant monitoring data and technical reports. Therefore, the staff concludes that there are no impacts of discharges of other metals in wastewater during the renewal term beyond those discussed in the GEIS.

- Water-use conflicts (plants with once-through cooling systems). Based on information in the GEIS, the Commission found that

  > These conflicts have not been found to be a problem at operating nuclear power plants with once-through heat dissipation systems.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of water use conflicts associated with the once-through cooling system during the renewal term beyond those discussed in the GEIS.

- Accumulation of contaminants in sediments or biota. Based on information in the GEIS, the Commission found that

  > Accumulation of contaminants has been a concern at a few nuclear power plants but has been satisfactorily mitigated by replacing copper alloy condenser tubes with those of another metal. It is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of available information. Therefore, the staff concludes that there are no impacts of accumulation of contaminants in sediments or biota during the renewal term beyond those discussed in the GEIS.

- Entrainment of phytoplankton and zooplankton. Based on information in the GEIS, the Commission found that

  > Entrainment of phytoplankton and zooplankton has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of entrainment of phytoplankton and zooplankton during the renewal term beyond those discussed in the GEIS.

- Cold shock. Based on information in the GEIS, the Commission found that

  > Cold shock has been satisfactorily mitigated at operating nuclear plants with once-through cooling systems, has not endangered fish populations or been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds, and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available

information. Therefore, the staff concludes that there are no impacts of cold shock during the renewal term beyond those discussed in the GEIS.

- Thermal plume barrier to migrating fish. Based on information in the GEIS, the Commission found that

  > Thermal plumes have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of thermal plume barriers to migrating fish during the renewal term beyond those discussed in the GEIS.

- Distribution of aquatic organisms. Based on information in the GEIS, the Commission found that

  > Thermal discharge may have localized effects but is not expected to effect the larger geographical distribution of aquatic organisms.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on the distribution of aquatic organisms during the renewal term beyond those discussed in the GEIS.

- Premature emergence of aquatic insects. Based on information in the GEIS, the Commission found that

  > Premature emergence has been found to be a localized effect at some operating nuclear power plants but has not been a problem and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of premature emergence of aquatic insects during the renewal term beyond those discussed in the GEIS.

- Gas supersaturation (gas bubble disease). Based on information in the GEIS, the Commission found that

  > Gas supersaturation was a concern at a small number of operating nuclear power plants with once-through cooling systems but has been satisfactorily mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of gas supersaturation during the renewal term beyond those discussed in the GEIS.

- Low dissolved oxygen in the discharge. Based on information in the GEIS, the Commission found that

  > Low dissolved oxygen has been a concern at one nuclear power plant with a once-through cooling system but has been effectively mitigated. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of low dissolved oxygen during the renewal term beyond those discussed in the GEIS.

- Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses. Based on information in the GEIS, the Commission found that

  > These types of losses have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of losses from

predation, parasitism, and disease among organisms exposed to sublethal stresses during the renewal term beyond those discussed in the GEIS.

- Stimulation of nuisance organisms. Based on information in the GEIS, the Commission found that

  > Stimulation of nuisance organisms has been satisfactorily mitigated at the single nuclear power plant with a once-through cooling system where previously it was a problem. It has not been found to be a problem at operating nuclear power plants with cooling towers or cooling ponds and is not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of stimulation of nuisance organisms during the renewal term beyond those discussed in the GEIS.

- Cooling tower impacts on crops and ornamental vegetation. Based on information in the GEIS, the Commission found that

  > Impacts from salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no cooling tower impacts on crops and ornamental vegetation during the renewal term beyond those discussed in the GEIS.

- Cooling tower impacts on native plants. Based on information in the GEIS, the Commission found that

  > Impacts from salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no cooling tower impacts on native plants during the renewal term beyond those discussed in the GEIS.

- Bird collisions with cooling towers. Based on information in the GEIS, the Commission found that

  > These collisions have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of bird collisions with cooling towers during the renewal term beyond those discussed in the GEIS.

- Microbiological organisms (occupational health). Based on information in the GEIS, the Commission found that

  > Occupational health impacts are expected to be controlled by continued application of accepted industrial hygiene practices to minimize worker exposures.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of microbiological organisms on occupational health during the renewal term beyond those discussed in the GEIS.

- Noise. Based on information in the GEIS, the Commission found that

  > Noise has not been found to be a problem at operating plants and is not expected to be a problem at any plant during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of noise during the renewal term beyond those discussed in the GEIS.

The Category 2 issues related to cooling system operation during the renewal term that are applicable to Peach Bottom Units 2 and 3 are discussed in the section that follows, and are listed in Table 4-2.

Table 4-2. Category 2 Issues Applicable to the Operation of the Peach Bottom Units 2 and 3 Cooling System During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Water use conflicts (plants with cooling ponds or cooling towers using make-up water from a small river with low flow)	4.3.2.1	A	4.1.1
AQUATIC ECOLOGY (FOR PLANTS WITH ONCE-THROUGH AND COOLING POND HEAT-DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	4.2.2.1.2; 4.3.3	B	4.1.2
Impingement of fish and shellfish	4.2.2.1.3; 4.3.3	B	4.1.3
Heat shock	4.2.2.1.4; 4.3.3	B	4.1.4
HUMAN HEALTH			
Microbiological organisms (public health)(plants using lakes or canals, or cooling towers or cooling ponds that discharge into a small river)	4.3.6	G	4.1.5

4.1.1 Water Use Conflicts (Plants With Cooling Ponds or Cooling Towers Using Make-Up Water From a Small River With Low Flow)

Water use conflicts for plants with cooling ponds or cooling towers using make-up water from a small river with low flow is a Category 2 issue, requiring a site-specific assessment before license renewal.

The staff independently reviewed the Peach Bottom Atomic Power Station ER (Exelon 2001a), visited the site, and reviewed the applicant's NPDES Permit issued by the Commonwealth of Pennsylvania (PA0009733, PDEP 2000), which expires on December 1, 2005.

Surface water withdrawals may impact riparian and in-stream habitat. Section 2.2.2 describes Peach Bottom site surface water withdrawals from Conowingo Pond.

The impact of consumptive loss on the downstream riparian communities is associated with the difference it could potentially cause in river surface elevation. As described in Section 2.1.3, Peach Bottom Units 2 and 3 normally operate as once-through plants. As necessary, 60 percent of the circulating water can also be diverted to three mechanical-draft helper cooling towers for additional cooling before discharging to the discharge canal. If the three helper cooling towers were operated, approximately 0.16 to 0.62 m^3/s (5.5 to 22 cfs) would be lost to evaporation (Section 316(a) Demonstration Report, July 1975). During a 50-year period, the minimum monthly average flow was 42.5 m^3/s (1500 cfs). The consumptive loss incurred by plant operation of the helper cooling towers has the greatest effect on surface elevation during low-flow periods. At the minimum monthly average flow, evaporative loss due to operation of the helper cooling towers would represent less than 2 percent of the river's flow.

The staff has reviewed the information provided by the applicant in the ER relative to potential water-use conflicts due to consumptive loss of stream flow from operation of the helper cooling towers. Because evaporation loss would be a small percentage of the lowest average monthly flow rate, as described above, the staff has concluded that the potential impacts are SMALL, and further mitigation is not warranted.

4.1.2 Entrainment of Fish and Shellfish in Early Life Stages

For plants with once-through cooling systems, entrainment of fish and shellfish in early life stages into cooling water systems associated with nuclear power plants is considered a Category 2 issue, requiring a site-specific assessment before license renewal.

The staff independently reviewed the Peach Bottom Atomic Power Station ER (Exelon 2001a), visited the site, and reviewed the applicant's NPDES Permit (PA0009733, PDEP 2000), which expires on December 1, 2005.

Section 316(b) of the Clean Water Act (CWA) requires that any standard established pursuant to Sections 301 or 306 of the CWA shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts (33 USC 1326). Entrainment through the condenser cooling system of fish and shellfish in the early life stages is a potential adverse environmental impact that can be minimized by the best available technology. Exelon (as PECO) submitted a comprehensive CWA Section 316(b) Demonstration to the U.S. Environmental Protection

Agency (EPA) in June 1977 in accordance with the "Special Conditions: Environmental Studies" provision of NPDES Permit PA00097733, issued December 31, 1976, and revised April 11, 1977 (PECO 1977). The 316(b) Demonstration stated that no significant detrimental effects had occurred in the population of organisms in Conowingo Pond between the pre- and the post-operational periods of study as a result of Peach Bottom Units 2 and 3 operation. The 316(b) Demonstration concluded that: "the intake structure at Peach Bottom reflects the best technology available for minimizing adverse environmental effects" (PECO 1977). Subsequent NPDES permits, renewed every 5 years, have required no further entrainment studies. In compliance with the provisions of the Clean Water Act and Pennsylvania's Clean Streams Law, Pennsylvania issued the current NPDES permit (PA0009733, PDEP 2000), which expires on December 1, 2005.

Section 2.2.5 discusses the efforts of State and Federal agencies to restore anadromous fish populations in the Susquehanna River. Exelon and other operators of hydroelectric facilities on the lower Susquehanna fund this activity. As a result of these efforts, numbers of adult anadromous fish (particularly American shad and blueback herring) ascending the river in the spring to spawn have increased dramatically. Numbers of post-spawning adults and juveniles (young-of-the-year) moving downstream in the fall have also increased substantially.

Exelon has not specifically evaluated entrainment of anadromous fishes because most (excluding one stretch of river between the Safe Harbor and York Haven dams) shad and herring spawning and nursery areas are upstream of the Holtwood, Safe Harbor, and York Haven hydroelectric dams and the Peach Bottom site (Figure 2-1). Larval shad grow quickly and develop into 10- to 15-cm (4- to 6-in.) juveniles by early fall. They begin to leave nursery areas and migrate downstream in September or October, depending on water temperatures, and pass through the turbines (and, less frequently, the spillway) of hydroelectric facilities en route to the Chesapeake Bay. These juvenile shad and herring are too large to be entrained in the condenser cooling water at Peach Bottom Units 2 and 3 (Susquehanna River Anadromous Fish Restoration Cooperative 1997, 1998, 1999, 2000).

The staff has reviewed the available information and based on the results of entrainment studies and the operating history of the Peach Bottom Units 2 and 3 intake structure, concludes that the potential impacts of entrainment of fish and shellfish in the early life stages in the cooling water intake system are SMALL. During the course of the SEIS preparation, the staff considered mitigation measures for the continued operation of Peach Bottom Units 2 and 3. When continued operation for an additional 20 years is considered as a whole, all of the specific effects on the environment (whether or not "significant") were considered. Because

there are no demonstrated, significant effects to Conowingo Pond fish related to entrainment and the juvenile shad and herring passing close to Peach Bottom Units 2 and 3 are too large to be entrained, the staff concludes that the measures in place (e.g., intake screens) provide mitigation for all impacts to entrainment and no further mitigation measures are warranted.

4.1.3 Impingement of Fish and Shellfish

For plants with once-through cooling systems, impingement of fish and shellfish on debris screens of cooling water systems associated with nuclear power plants is considered a Category 2 issue, requiring a site-specific assessment before license renewal.

The staff independently reviewed the Peach Bottom Units 2 and 3 ER (Exelon 2001a), visited the site, and reviewed the applicant's NPDES permit (PA0009733, PDEP 2000), which expires on December 1, 2005.

Section 316(b) of the Clean Water Act (CWA) requires that any standard established pursuant to Sections 301 or 306 of the CWA shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts (33 USC 1326). The designed operation criteria are maintained in part by removal of sediments that are deposited in the canal. Maintenance of the designed depth for the intake canal helps ensure that approach velocities at the screens meet criteria. Impingement on debris screens of the cooling system of fish and shellfish is a potential adverse environmental impact that can be minimized by the best available technology. Exelon (as PECO) submitted a 316(b) Demonstration to the EPA in June 1977 in accordance with the "Special Conditions: Environmental Studies" provision of NPDES Permit PA0009733, issued December 31, 1976, and revised April 11, 1977 (PECO 1977). The 316(b) Demonstration stated that no significant detrimental effects had occurred in the population of organisms in Conowingo Pond between the pre- and the post-operational periods of study as a result of Peach Bottom Units 2 and 3 operation. The 316(b) Demonstration concluded that: "the intake structure at Peach Bottom reflects the best technology available for minimizing adverse environmental effects" (Philadelphia Electric Company 1977). Subsequent NPDES permits, renewed every 5 years, have required no further impingement studies. In compliance with the provisions of the Clean Water Act and Pennsylvania's Clean Streams Law, Pennsylvania issued the current NPDES permit.

Since 1985, Exelon has conducted studies at the Peach Bottom site in the fall of the year to assess the impingement of outmigrating juvenile American shad and river herring. Juvenile

American shad in the Susquehanna River upstream of Conowingo Dam are from two sources: natural reproduction of adult spawners and hatchery stockings of larvae (fry) produced in Pennsylvania Fish and Boat Commission or U.S. Fish and Wildlife Service facilities (Pennsylvania Fish & Boat Commission 2000). During 1999, approximately 95 percent of the juveniles examined at the Peach Bottom site were produced in hatcheries (Susquehanna River Anadromous Fish Restoration Cooperative 2000). During 1999, intake screens at Peach Bottom Units 2 and 3 were examined three times weekly from October 18 through December 20 (23 sample dates). More than 5000 fish were impinged, including 285 juvenile (young-of-the-year) American shad, 112 juvenile blueback herring, and 2 adult blueback herring (Susquehanna River Anadromous Fish Restoration Cooperative 2000).

The number of American shad impinged during the fall of 1999 was very small compared to the number of American shad fry and fingerlings stocked in the Susquehanna River and its tributaries during the previous summer (14.4 million fry were stocked during May and June 1999). The number of American shad and blueback herring impinged was very small compared to the numbers of spawning adults captured and passed at the Conowingo Dam during the spring of 1999 (69,712 American shad and 130,625 blueback herring), particularly when the reproductive potential of these species is taken into consideration (Susquehanna River Anadromous Fish Restoration Cooperative 2000). Depending on size, age, and condition, each American shad female produces an average of 250,000 eggs. Each blueback herring female produces an average of 80,000 eggs. Based on 1999 studies, the number of American shad and blueback herring impinged at Peach Bottom Units 2 and 3 represents a very small percentage of the total number of outmigrating juvenile and adult fish. This loss is not sufficiently high to adversely affect Susquehanna River shad and river herring populations and does not represent a threat to ongoing anadromous fish restoration efforts. In recent years, 82 (1999) to 98 (1997) percent of all fish impinged at Peach Bottom Units 2 and 3 have been gizzard shad. Because this is a fast-growing species with high reproductive potential, impingement loss has had no discernible effect on the Conowingo Pond gizzard shad population.

The staff has reviewed the available information and based on the results of impingement studies and the operating history of the Peach Bottom Units 2 and 3 intake structure, concludes that the potential impacts of impingement of fish and shellfish the on debris screens of the cooling water intake system are SMALL. During the course of the SEIS preparation, the staff considered mitigation measures for the continued operation of Peach Bottom Units 2 and 3. When continued operation for an additional 20 years is considered as a whole, all of the specific effects on the environment (whether or not "significant") were considered. Because the impingement losses at Peach Bottom Units 2 and 3 are not great enough to adversely affect

Susquehanna River populations and do not represent a threat to restoration efforts, the staff concludes that the measures in place (e.g., intake screens and waste treatment facility) provide mitigation for all impacts related to impingement and no further mitigation measures are warranted.

4.1.4 Heat Shock

For plants with once-through cooling systems, the effects of heat shock are listed as a Category 2 issue and require plant-specific evaluation before license renewal. NRC made impacts on fish and shellfish resources resulting from heat shock a Category 2 issue, because of continuing concerns about thermal discharge effects and the possible need to modify thermal discharges in the future in response to changing environmental conditions (NRC 1996). Information to be ascertained includes: (1) type of cooling system (whether once-through or cooling pond), and (2) evidence of a CWA Section 316(a) variance or equivalent state documentation.

The staff independently reviewed the Peach Bottom Peach Bottom Units 2 and 3 ER (Exelon 2001a), visited the site, and reviewed the applicant's NPDES permit (PA0009733, PDEP 2000), which expires on December 1, 2005.

Peach Bottom Units 2 and 3 use a once-through heat dissipation system. Exelon also has Section 316(a) alternative thermal effluent limits. Three mechanical draft ("helper") cooling towers were built on berms adjacent to the discharge canal to supply additional cooling capacity in summer months, but in recent years these cooling towers have not been necessary. Section 316(a) of the CWA establishes a process whereby a thermal effluent discharger can demonstrate that thermal discharge limitations are more stringent than necessary to protect a balanced indigenous population of fish and wildlife, and obtain alternative facility-specific thermal discharge limits (33 USC 1326). Exelon (as PECO) submitted a CWA Section 316(a) demonstration for Peach Bottom Units 2 and 3 in July 1975, which was accepted by the Pennsylvania Department of Environmental Protection and is renewed by that State agency every 5 years. The current NPDES permit expires on December 1, 2005.

The staff has reviewed the available information and, on the basis of the conditions of the NPDES permit and the operating history of the Peach Bottom Units 2 and 3 discharge, concludes that the potential impacts of discharging heated water from the cooling water intake system are so minor that they will not noticeably alter any component of the aquatic ecosystem and are, therefore, SMALL. During the course of the SEIS preparation, the staff considered mitigation measures for the continued operation of Peach Bottom Units 2 and 3. When continued operation for an additional 20 years is considered as a whole, all of the specific

effects on the environment (whether or not "significant") were considered. Because the heated water discharged into Conowongo Pond does not change the temperature enough to adversely impact a balanced, indigenous population of fish and wildlife, the staff concludes that the measures in place(e.g., waste treatment facility) provide mitigation for all impacts related to entrainment and no further mitigation measures are warranted.

4.1.5 Microbiological Organisms (Public Health)

For plants discharging cooling water to cooling ponds, lakes, canals, or small rivers, the effects of microbiological organisms on human health are listed as a Category 2 issue and require plant-specific evaluation before license renewal. The Category 2 designation is based on the magnitude of the potential public health impacts associated with thermal enhancement of *Naegleria fowleri* (a pathogenic amoeba) that could not be determined generically. NRC noted that impacts of nuclear plant cooling towers and thermal discharges are considered to be of small significance if they do not enhance the presence of microorganisms that are detrimental to water quality and public health (NRC 1999). The assessment criteria relate to thermal discharge temperature, thermal characteristics, thermal conditions for the enhancement of *N. fowleri*, and impact to public health.

The staff independently reviewed the Peach Bottom Units 2 and 3 ER (Exelon 2001a), visited the site, and reviewed the applicant's NPDES permit (PA0009733, PDEP 2000), which expires on December 1, 2005.

Peach Bottom Units 2 and 3 use a once-through cooling water system that withdraws from and discharges to Conowingo Pond. Five mechanical draft ("helper") cooling towers were built on berms adjacent to the discharge canal to supply additional cooling capacity in summer months, but in recent years these cooling towers have not been necessary. Discharge limits and monitoring requirements for Peach Bottom Units 2 and 3 are set forth in the applicant's NPDES Permit. The NPDES permit states that "the permittee shall provide for effective disinfection of this discharge to control disease-producing organisms during the swimming season (May 1 through September 30) to achieve a fecal coliform concentration not greater than 200/100 ml geometric average, and not greater than 1000/100 ml in more than 10% of the samples tested" [Part C(I)(E)].

The discharge temperatures from Peach Bottom Units 2 and 3, which do not exceed 43.3 °C (110 °F) in late summer, are below those known to be conducive to growth and survival of thermophilic pathogens. Further, disinfection of the sewage effluent from the Peach Bottom site reduces the likelihood that a seed source or inoculants would be introduced to the station's heated discharge or Conowingo Pond.

The staff has reviewed the thermal characteristics of the Conowingo Pond and the Peach Bottom Units 2 and 3 discharge. The staff does not expect power plant operations to stimulate growth and reproduction of pathogenic microbiological organisms in Conowingo Pond downstream of the plant. Under certain circumstances, the organisms might be present in the immediate area of the discharge outfall but would not be expected in sufficient concentrations to pose a threat to downstream water users. Many of these pathogenic microbiological organisms are ubiquitous in nature, occurring in the digestive tracts of wild mammals and birds, but are usually only a problem when the host is immunologically compromised. The thermal characteristics of the Peach Bottom Units 2 and 3 discharge would not promote the growth of microbiological organisms that are detrimental to water and public health. The staff does not expect operations of Peach Bottom Units 2 and 3 or cooling systems to change significantly over the license renewal term, and there is no reason to believe that discharge temperatures will increase or that disinfection would cease. Thus, the staff concludes that potential effects of microbiological organisms on human health resulting for the operation of the plant's cooling water discharge to the aquatic environment on or in the vicinity of the site are SMALL. The staff also concludes that the mitigation in place at the Peach Bottom site, that is management of the discharge temperatures into Conowingo Pond and sewage treatment, will control any potential growth of thermophilic microbiological organisms and further mitigation is not warranted.

4.2 Transmission Lines

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to the transmission line from Peach Bottom Units 2 and 3 are listed in Table 4-3. Exelon stated in its ER that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 OLs. The staff has not identified any significant new information during its independent review of the Exelon ER (Exelon 2001a), the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the staff concluded in the GEIS that the impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-3. Category 1 Issues Applicable to Transmission Lines During the Renewal Term

ISSUE -- 10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
TERRESTRIAL RESOURCES	
Power line right-of-way management (cutting and herbicide application)	4.5.6.1
Bird collisions with power lines	4.5.6.2
Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)	4.5.6.3
Floodplains and wetland on power line right-of-way	4.5.7
AIR QUALITY	
Air quality effects of transmission lines	4.5.2
LAND USE	
Onsite land use	4.5.3
Power line right-of-way	4.5.3

A brief description of the staff's review and GEIS conclusions, as codified in Table B-1 of the GEIS, for each of these issues follows:

- Power line right-of-way management (cutting and herbicide application). Based on information in the GEIS, the Commission found that

  > The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, and consultation with the U.S. Fish and Wildlife Service (FWS), or its evaluation of other information. Therefore, the staff concludes that there are no impacts of power line right-of-way management during the renewal term beyond those discussed in the GEIS.

- Bird collisions with power lines. Based on information in the GEIS, the Commission found that

  > Impacts are expected to be of small significance at all sites.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, consultation with FWS, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of bird collisions with power lines during the renewal term beyond those discussed in the GEIS.

- Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock). Based on information in the GEIS, the Commission found that

  > No significant impacts of electromagnetic fields on terrestrial flora and fauna have been identified. Such effects are not expected to be a problem during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of electromagnetic fields on flora and fauna during the renewal term beyond those discussed in the GEIS.

- Flood plains and wetlands on power line right-of-way. Based on information in the GEIS, the Commission found that

  > Periodic vegetation control is necessary in forested wetlands underneath power lines and can be achieved with minimal damage to the wetland. No significant impact is expected at any nuclear power plant during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, consultation with FWS, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of power line rights-of-way on floodplains and wetlands during the renewal term beyond those discussed in the GEIS.

- Air-quality effects of transmission lines. Based on the information in the GEIS, the Commission found that

  > Production of ozone and oxides of nitrogen is insignificant and does not contribute measurably to ambient levels of these gases.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no air quality impacts of transmission lines during the renewal term beyond those discussed in the GEIS.

- Onsite land use. Based on the information in the GEIS, the Commission found that

  > Projected onsite land use changes required during the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no onsite land use impacts during the renewal term beyond those discussed in the GEIS.

- Power line right-of-way (land use). Based on information in the GEIS, the Commission found that

  > Ongoing use of power line right of ways would continue with no change in restrictions. The effects of these restrictions are of small significance.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no impacts of power line rights-of-way on land use during the renewal term beyond those discussed in the GEIS.

There is one Category 2 issue and one uncategorized issue related to transmission lines. These issues are listed in Table 4-4 and are discussed in Sections 4.2.1 and 4.2.2.

Table 4-4. Category 2 and Uncategorized Issues Applicable to Transmission Lines During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
HUMAN HEALTH			
Electromagnetic fields, acute effects (electric shock)	4.5.4.1	H	4.2.1
Electromagnetic fields, chronic effects	4.5.4.2	NA	4.2.2

4.2.1 Electromagnetic Fields—Acute Effects

In the GEIS (NRC 1996), the staff found that without a review of the conformance of each nuclear plant transmission line with National Electrical Safety Code (NESC 1997) criteria, it was not possible to determine the significance of the electric shock potential. Evaluation of individual plant transmission lines is necessary because the issue of electric shock safety was not addressed in the licensing process for some plants. For other plants, land use in the vicinity of transmission lines may have changed, or power distribution companies may have chosen to upgrade line voltage. To comply with 10 CFR 51.53(c)(3)(ii)(H), the applicant must provide an assessment of the potential shock hazard if the transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system do not meet the recommendations of the NESC for preventing electric shock from induced currents. In the case of Peach Bottom, there have been no previous NRC or NEPA analyses of transmission-line induced current hazards. Therefore, this section provides an analysis of the Peach Bottom transmission line's conformance with the NESC standard. The analysis is based on data generated for the design and construction of a non-Peach Bottom transmission line that runs parallel to the Peach Bottom line.

There is one 500-kV transmission line that connects the Peach Bottom switchyard to the Keeney substation. This line was constructed before the current (1997) NESC standard was adopted. Another line, a 230-kV line, shares the corridor for approximately 19 km (12 miles), from Colora to the Cecil substations. Exelon performed an analysis to confirm that the transmission lines conform to the current NESC clearance requirements for limiting electric shock hazard. The NESC requires that transmission lines be designed to limit the steady-state current due to electrostatic effects to 5 mA root mean square (rms).

Calculations were performed to estimate the electrostatic effects (induced effects) based on the strength of the electrostatic field , which, in turn, depends on the voltage of the transmission line. The calculations were based on scaling factors from other induced current calculations, which were applied to the electric field strengths to obtain the current (Tetra Tech NUS 2000). It was assumed that a large tractor-trailer (55-ft long by 8-ft wide and 11.8 ft average height) is located directly under the transmission line. Scaling factors for tractor-trailers in the other induced current calculations ranged from 0.65 to 0.92 (mA-m/kV). An average scaling factor of 0.80 mA-m/kV was used. For comparison the scaling factor in the EPRI Handbook, Table 8.8.3, for a truck (52-ft-long by 8-ft-wide by 12-ft-tall) is 0.64. Hence the analysis is conservative. The maximum line voltage for the 500-kV line is 525 kV, and for the 230-kV line is 241.5 kV. Based on these maximum field strengths the tractor-trailer would experience a field-strength of 6.22 kV/m, resulting in an induced current of 4.98 mA.

The maximum steady state short-circuit currents determined by Exelon both onsite and offsite are within the NESC limit of 5 mA. Therefore, the staff concludes that the impact of the potential for electric shock is SMALL, and further mitigation is not warranted.

4.2.2 Electromagnetic Fields—Chronic Effects

In the GEIS, the chronic effects of 60-Hz electromagnetic fields from power lines were not designated as Category 1 or 2, and will not be until a scientific consensus is reached on the health implications of these fields.

The potential for chronic effects from these fields continues to be studied and is not known at this time. The National Institute of Environmental Health Sciences (NIEHS) directs related research through the U.S. Department of Energy (DOE). A recent report (NIEHS 1999) contains the following conclusion:

> The NIEHS concludes that ELF-EMF [extremely low frequency-electromagnetic field] exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern.

This statement is not sufficient to cause the staff to change its position with respect to the chronic effects of electromagnetic fields. The staff considers the GEIS finding of "not applicable" still appropriate and will continue to follow developments on this issue.

4.3 Radiological Impacts of Normal Operations

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to Peach Bottom Units 2 and 3 in regard to radiological impacts are listed in Table 4-5. Exelon stated in its ER (Exelon 2001a) that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 OLs.

Table 4-5. Category 1 Issues Applicable to Radiological Impacts of Normal Operations During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
HUMAN HEALTH	
Radiation exposures to public (license renewal term)	4.6.2
Occupational radiation exposures (license renewal term)	4.6.3

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For all of those issues, the staff concluded in the GEIS that the impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

A brief description of the staffs review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Radiation exposures to public (license renewal term). Based on information in the GEIS, the Commission found that

  > Radiation doses to the public will continue at current levels associated with normal operations.

The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of radiation exposures to the public during the renewal term beyond those discussed in the GEIS.

- Occupational radiation exposures (license renewal term). Based on information in the GEIS, the Commission found that

  > Projected maximum occupational doses during the license renewal term are within the range of doses experienced during normal operations and normal maintenance outages, and would be well below regulatory limits.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of occupational radiation exposures during the renewal term beyond those discussed in the GEIS.

There are no Category 2 issues related to radiological impacts of routine operations.

4.4 Socioeconomic Impacts of Plant Operations During the License Renewal Period

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to socioeconomic impacts during the renewal term are listed in Table 4-6. Exelon (formerly PECO) stated in its ER (Exelon 2001a) that it is not aware of any new and significant information associated with the renewal of Peach Bottom Units 2 and 3 OLs. The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS (NRC 1996). For these issues, the staff concluded in the GEIS that the impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-6. Category 1 Issues Applicable to Socioeconomics During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
SOCIOECONOMICS	
Public services: public safety, social services, and tourism and recreation	4.7.3; 4.7.3.3; 4.7.3.4; 4.7.3.6
Public services: education (license renewal term)	4.7.3.1
Aesthetic impacts (license renewal term)	4.7.6
Aesthetic impacts of transmission lines (license renewal term)	4.5.8

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of these issues follows:

- Public services: public safety, social services, and tourism and recreation. Based on information in the GEIS, the Commission found that

  > Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on public safety, social services, and tourism and recreation during the renewal term beyond those discussed in the GEIS.

- Public services: education (license renewal term). Based on information in the GEIS, the Commission found that

  > Only impacts of small significance are expected.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts on education during the renewal term beyond those discussed in the GEIS.

- Aesthetic impacts (license renewal term). Based on information in the GEIS, the Commission found that

  No significant impacts are expected during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no aesthetic impacts during the renewal term beyond those discussed in the GEIS.

- Aesthetic impacts of transmission lines (license renewal term). Based on information in the GEIS, the Commission found that

  No significant impacts are expected during the license renewal term.

  The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no aesthetic impacts of transmission lines during the renewal term beyond those discussed in the GEIS.

Table 4-7 lists the Category 2 socioeconomic issues, which require plant-specific analysis and environmental justice, which was not addressed in the GEIS.

Table 4-7. Environmental Justice and GEIS Category 2 Issues Applicable to Socioeconomics During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
SOCIOECONOMICS			
Housing impacts	4.7.1	I	4.4.1
Public services: public utilities	4.7.3.5	I	4.4.2
Offsite land use (license renewal term)	4.7.4	I	4.4.3
Public Services, transportation	4.7.3.2	J	4.4.4
Historic and archaeological resources	4.7.7	K	4.4.5
Environmental Justice	Not addressed[(a)]	Not addressed[(a)]	4.4.6

(a) Guidance related to environmental justice was not in place at the time the GEIS and the associated revision to 10 CFR Part 51 were prepared. Therefore, environmental justice must be addressed in the licensee's environmental report and the staff's environmental impact statement.

4.4.1 Housing Impacts During Operations

In determining housing impacts, the applicant chose to follow Appendix C of the GEIS (NRC 1996), which presents a population characterization method that is based on two factors, "sparseness" and "proximity" (GEIS Section C.1.4 [NRC 1996]). Sparseness measures population density within 32 km (20 mi) of the site, and proximity measures population density and city size within 80 km (50 mi). Each factor has categories of density and size (GEIS Table C.1), and a matrix is used to rank the population category as low, medium, or high (GEIS Figure C.1).

In 1990, the population living within 32 km (20 mi) of Peach Bottom Units 2 and 3 was estimated to be approximately 481,900 (Exelon 2001a, Table G.2-2). This translates to around 150 persons/km^2 (383 persons/mi^2) living on the land area present within a 32-km (20-mi) radius of the Peach Bottom site. This concentration falls into the GEIS sparseness Category 4 (i.e., having greater than or equal to 46 persons/km^2 [120 persons/mi^2]). These calculations were redone using the 2000 Census of Population, finer geographic detail, and a more conservative rule, which counted only those Census block groups contained entirely within the 32-km (20-mi) circle. This produced an estimate of at least 452,400, or 139 persons/km^2 (360 persons/mi^2), still GEIS sparseness Category 4.

The proximity score also was recalculated by the NRC staff using the 2000 Census. The conservative estimate using the 2000 Census was about 5.3 million, or 260 persons/km^2 (670 persons/mi^2), well within proximity Category 4. Applying the GEIS proximity measures (NRC 1996), Peach Bottom Units 2 and 3 are classified as Category 4 (i.e., having greater than or equal to 73 persons/km^2 [190 persons/mi^2]) within 80 km (50 mi) of the site. According to the GEIS, these sparseness and proximity scores identify the nuclear units as being located in a high-population area.

In 10 CFR Part 51, Subpart A, Appendix B, Table B-1, NRC concluded that impacts on housing availability are expected to be of small significance at plants located in a high-population area where growth-control measures are not in effect. The Peach Bottom site is located in a high-population area, and although both York County and Lancaster County and their municipal and township governmental units attempt to direct growth to maintain the rural character of the southern parts of the counties (Lancaster County [PA] Planning Commission 1997, Lancaster County [PA] Planning Commission 1999, York County Planning Commission 1997, York County Department of Planning and Zoning 2000), these growth-control measures would not limit the relatively small amount of additional housing that might be required. Based on the NRC criteria, Exelon expects housing impacts to be SMALL during continued operations (Exelon 2001a).

SMALL impacts result when no discernible change in housing availability occurs, changes in rental rates and housing values are similar to those occurring statewide, and no housing construction or conversion is required to meet new demand (NRC 1996). The GEIS assumes that no more than a total additional staff of 60 permanent workers might be needed at each unit during the license renewal period to perform routine maintenance and other activities. Although Exelon expects to perform these routine activities during scheduled outages, they assumed they would not add more than 60 total employees to their permanent staff during license renewal (Exelon 2001a). This addition of 60 permanent workers, plus 81 indirect jobs (Exelon 2001a), would result in an increased demand for a total of 141 housing units around the Peach Bottom site (or 93 housing units for York and Lancaster Counties).[(a)] The demand for the existing housing units could be met with the construction of new housing or use of existing, unoccupied housing. In York and Lancaster Counties, nonagricultural employment was approximately 398,000 in 2000 (Commonwealth of Pennsylvania Department of Labor and Industry Center for Workforce Information and Analysis 2001) and the population at around 870,000 in 2000 (Exelon 2001a). Even if the increase in projected housing units were

(a) This assumes 66 percent of the new hires reside in the two counties (see Section 2.2.8.1).

concentrated in the rural southern parts of York and Lancaster counties, it would not create a discernible change in housing availability, change in rental rates or housing values, or spur much new construction or conversion. As a result, Exelon concludes that the impacts would be SMALL and mitigation measures would not be necessary (Exelon 2001a).[(a)]

The staff reviewed the available information relative to housing impacts and Exelon's conclusions. Based on this review, the staff concludes that the impact on housing during the license renewal period would be SMALL, and further mitigation is not warranted.

4.4.2 Public Services: Public Utility Impacts During Operations

Impacts on public utility services are considered SMALL if there is little or no change in the ability of the system to respond to the level of demand, and thus there is no need to add capital facilities. Impacts are considered MODERATE if overtaxing of service capabilities occurs during periods of peak demand. Impacts are considered LARGE if existing levels of service (e.g., water or sewer services) are substantially degraded and additional capacity is needed to meet ongoing demands for services. The GEIS indicates that, in the absence of new and significant information to the contrary, the only impacts on public utilities that could be significant are impacts on public water supplies (NRC 1996).

Analysis of impacts on the public water supply system considered both plant demand and plant-related population growth. Section 2.2.2 describes the Peach Bottom Units 2 and 3 permitted withdrawal rate and actual use of water. Exelon plans no refurbishment in conjunction with this license renewal, so plant demand would not change beyond current demands (Exelon 2001a).

Exelon assumed an increase of 60 permanent employees during license renewal, the generation of 141 new jobs, and a net overall population increase of approximately 375 persons and 93 households as a result of those jobs,[(b)] all of which would create SMALL impacts. The plant-related population increase would require an additional 115 m^3/day (30,000 gal/day) of potable water (Exelon 2001a).[(c)] This amount is within the residual capacity of the existing water systems that service York and Lancaster counties. The current approximate average daily demand for both counties combined is 371,000 m^3/day (98 million gpd), and the projected

(a) The Exelon estimate of 93 housing units is likely to be an extreme "upper bound" estimate. Most of the potentially new jobs would most likely be filled by existing area residents, thus creating no, or little, net demand for housing.
(b) Calculated by assuming that the average number of households is 1 per new job and household size is 2.66 persons per household (Exelon 2001a).
(c) Calculated assuming that the average American uses between 50 and 80 gallons of water for personal use per day; 375 people x 80 gallons per person/day = 30,000 gallons/day (115 m^3/day).

expected demand in 2010 is 503,500 m^3/day (133 million gpd). The additional 115 m^3/day is 0.03 percent of the current demand and 0.02 percent of the projected demand. The staff finds that the impact of increased water use on area water systems is SMALL and that further mitigation is not warranted.

4.4.3 Offsite Land Use During Operations

Offsite land use during the license renewal term is a Category 2 issue (10 CFR Part 51, Subpart A, Appendix B, Table B-1). Table B-1 of 10 CFR Part 51 Subpart A, Appendix B notes that "significant changes in land use may be associated with population and tax revenue changes resulting from license renewal."

Section 4.7.4 of the GEIS defines the magnitude of land-use changes as small if very little new development and minimal changes to an area's land-use pattern result. Moderate change results if considerable new development and some changes to the land-use pattern occur. The magnitude of change is large if large-scale new development and major changes in the land-use pattern occur.

Exelon has identified a maximum of 60 additional employees during the license renewal term plus an additional 81 indirect jobs (total 141) in the surrounding community (Exelon 2001a). Section 3.7.5 of the GEIS (NRC 1996) states that if plant-related population growth is less than 5 percent of the study area's total population, offsite land-use changes would be small, especially if the study area has established patterns of residential and commercial development, a population density of at least 23 persons/km^2 (60 persons/mi^2), and at least one urban area with a population of 100,000 or more within 80 km (50 mi). In this case, population growth will be less than 5 percent of the area's total population, the area has established patterns of residential and commercial development, a population density of well over 23 persons/km^2 (60 persons/mi^2), and at least one metropolitan area (Baltimore Metropolitan Statistical Area) with a population of 100,000 or more within 80 km (50 mi). Consequently, the staff concludes that population changes resulting from license renewal are likely to result in small offsite land-use impacts.

Tax revenue can affect land use because it enables local jurisdictions to be able to provide the public services (e.g., transportation and utilities) necessary to support development. Section 4.7.4.1 of the GEIS states that the assessment of tax-driven land-use impacts during the license renewal term should consider (1) the size of the plant's payments relative to the community's total revenues, (2) the nature of the community's existing land-use pattern, and (3) the extent to which the community already has public services in place to support and guide development. If the plant's tax payments are projected to be small relative to the community's total revenue, tax-driven land-use changes during the plant's license renewal term would be

small, especially where the community has pre-established patterns of development and has provided adequate public services to support and guide development. Section 4.7.2.1 of the GEIS states that if tax payments by the plant owner are less than 10 percent of the taxing jurisdiction's revenue, the significance level would be small. If the plant's tax payments are projected to be medium to large relative to the community's total revenue, new tax-driven land-use changes would be moderate.

As discussed in Section 2.2.8.6, the amounts of property taxes to be paid by Exelon for Peach Bottom Units 2 and 3 to York County, Peach Bottom Township, and the South Eastern School District have not yet been determined. Until a determination is made, Exelon has agreed to pay non-refundable payments to the following beginning in 2000: York County, $151,000 per year; Peach Bottom Township, $30,000 per year; and the South Eastern School District, $840,000 per year. The size of the plant's payments relative to the community's total revenues is York County, 0.07 percent; Peach Bottom Township, 1.8 percent; and South Eastern School District, 3.6 percent. In addition, Exelon will pay the school district $420,000 (1.8 percent) per year, beginning in 2000, that could be refunded, pending the final determination.

Exelon has determined that major refurbishment activities are not necessary at Peach Bottom Units 2 and 3 in conjunction with license renewal. The plant's tax payments are projected to be less than 10 percent of the community's total revenue. Additional mitigation for land-use impacts during the license renewal period does not appear to be warranted. For these reasons, the staff concludes that the net impact of plant-related population increases is likely to be SMALL. The staff also concludes that tax-related land-use impacts are likely to be SMALL.

4.4.4 Public Services: Transportation Impacts During Operations

On October 4, 1999, 10 CFR 51.53(c)(3)(ii)(J) and 10 CFR Part 51, Subpart A, Appendix B, Table B-1 were revised to clearly state that "Public Services: Transportation Impacts During Operations" is a Category 2 issue (see NRC 1999 for more discussion of this clarification). The issue is treated as such in this supplemental environmental impact statement (SEIS).

Expected population growth in the area around the Peach Bottom site is not due directly to increases in employment at Peach Bottom Units 2 and 3. The permanent employment associated with Peach Bottoms Units 2 and 3 is currently about 1000 employees (Exelon and contractors [Exelon 2001a]). During refueling outages, which occur about once a year, as many as 800 additional workers are hired on a temporary basis. The Pennsylvania Department of Transportation does not maintain level-of-service designations for roadways in the Commonwealth; however, the local residents do not regard the associated annual traffic increase as a problem (Section 2.1.1.2). The "upper bound" potential increase in permanent staff during the license renewal term is 60 additional workers, or approximately 6 percent of the

current permanent and contract work force of approximately 1000. Access to the Peach Bottom site is on State routes. Based on these facts, Exelon concluded that the impacts on transportation during the license renewal term would be SMALL, and further mitigation measures would not be warranted.

The staff reviewed Exelon's assumptions and resulting conclusions. The staff concludes that any impact of Exelon on transportation service degradation is likely to be SMALL and not require further mitigation.

4.4.5 Historic and Archaeological Resources

There are no known historic or archaeological resources at the Peach Bottom site. One feature, which the State of Delaware considers an historic property, a feeder canal for the Chesapeake and Delaware Canal system, crosses the Peach Bottom-to-Keeney, Delaware transmission line. The Peach Bottom Units 2 and 3 license renewal application for continued operations does not include proposals for future land-disturbing activities or structural modifications beyond routine maintenance at the plant.

Exelon (as PECO) initiated communication with the Pennsylvania, Delaware and Maryland State Historic Preservation Offices by letters dated July and August of 2000 (PECO Nuclear 2000a, 2000b, 2000c). The letters expressed a desire to assess the effects of the license renewal on historic properties, as required by the Nuclear Regulatory Commission of applicants for operating license renewal. The letters specifically include the power station and a single related transmission line (Peach Bottom-to-Keeney, Delaware) within the purview of the undertaking. Exelon indicated that there were no known historic properties in the area of potential effect of the undertaking. Exelon requested State concurrence with a determination that the license renewal process would have "…no effect on any historic or archaeological properties."

As discussed in more detail below, both the Pennsylvania and Maryland State Historic Preservation Offices responded to Exelon's letters: they concurred that the operation and management of the Peach Bottom facility would not affect historic properties. The Delaware State Historic Preservation Office made no written response to the applicant but informed NRC staff of the presence of a property in Delaware in the vicinity of the transmission line that it considers historic.

The Pennsylvania State Historic Preservation Office wrote on December 14, 2000, that it had reviewed the undertaking in accordance with Section 106 of the National Historic Preservation Act. As long as the renewed license to operate the Peach Bottom facility involved only

operational and maintenance activities, they agreed that the undertaking would not affect historic and archaeological resources (Pennsylvania Bureau for Historic Preservation 2000).

The Maryland State Historic Preservation Office responded similarly on September 22, 2000. The Administrator of Project Review and Compliance wrote it is "…the opinion of the Maryland Historical Trust that the license renewal application will have no effect on historic properties eligible for or listed in National Register of Historic Places, including standing structures and archeological sites." (Maryland Department of Housing and Community Development 2000). She said that no additional archaeological investigations are warranted because of prior disturbance in the project area, and that no additional architectural investigations are necessary (Maryland Department of Housing and Community Development 2000).

Although the Delaware State Historic Preservation Office did not respond in writing to the letter from the applicant, they have expressed concerns to the NRC (Delaware SHPO 2001). Its written communication was triggered by the NRC's Federal Register notice of intent to develop an EIS for the proposed action to consider the renewal of the applicant's Peach Bottom Units 2 and 3 operating licenses for an additional 20 years.

A representative of the Delaware State Historic Preservation Office had made earlier informal contact with NRC staff and participated in an onsite examination in the State of Delaware where the transmission line crosses remnants of a feeder canal for the old Chesapeake and Delaware Canal. The letter from the Delaware State Historic Preservation Office followed-up on the October visit and confirmed statements made by the representative during the trip and in subsequent conversation (Delaware SHPO 2001):

(1) The Delaware State Historic Preservation Office considers the re-licensing a Federal undertaking with the potential to affect historic properties.

(2) The official finds in a preliminary evaluation that a feeder canal crossed by the Peach Bottom-to-Keeney, Delaware transmission line is a historic resource that meets standards for its listing on the National Register of Historic Places.

(3) The Delaware State Historic Preservation Office believes that operation of Peach Bottom under the previous license has caused adverse effects on the feeder canal at the transmission line crossing.

(4) Finally, the Delaware State Historic Preservation Office official anticipates that grant of a license renewal by Nuclear Regulatory Commission for operation of Peach Bottom would allow continuation of adverse effects on the feeder canal's key historical features (the canal, its towpath, and an associated back borrow area).

The NRC staff has considered the position expressed by the Delaware State Historic Preservation Office and provides the following discussion to put the issue into context. The original operating licenses were granted after full compliance with the provisions of the National Historic Preservation Act. Exelon, its predecessors, and associated agents for operation of the Peach Bottom-to-Keeney, Delaware transmission line, performed work without knowledge of the existence and historic value of the Chesapeake and Delaware feeder canal that traverses the transmission line corridor.

In 1966, seven years or more before the Federal government granted the initial operating licenses for Peach Bottom Units 2 and 3, Congress passed the National Historic Preservation Act. Section 106 (16 USC § 470j(a)), the provision of that Act most relevant to the current consideration, set out the requirements for Federal agencies to consider the impact of their Federally funded or Federally assisted undertakings on historic preservation. Under the Section, Federal agencies had to

> …prior to the issuance of any license, …take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation … a reasonable opportunity to comment with regard to such undertaking. (16 USC § 470j(a))

The original regulations to implement Section 106 of the Act (36 CFR Part 800) took effect in 1979, five years after the Federal government granted the initial operating licenses for Peach Bottom Units 2 and 3. Until 1979, the Advisory Council on Historic Preservation had no established regulatory process for Federal agencies to use to fulfill National Historic Preservation Act Section 106 responsibilities.

In 1972, with a request for comment, the U.S. Atomic Energy Commission sent information on the proposed license action for Peach Bottom Units 2 and 3, including information on historic and archaeological resources and determinations, to the Advisory Council on Historic Preservation (AEC 1972). Although the Advisory Council on Historic Preservation made no reply (AEC 1973), the U.S. Atomic Energy Commission met the then current standard for National Historic Preservation Act compliance.

The feeder canal identified as a historic property by the State of Delaware was first documented in September 1974 (Guider 1974). That is, it was identified after the Federal government granted the license and two years after the U.S. Atomic Energy Commission sent its Draft Environmental Statement on the original license decision to the Advisory Council on Historic Preservation with a request for comment (AEC 1973, AEC 1972).

In his letter of October 29, 2001, the Delaware State Historic Preservation Office official made a request that the Nuclear Regulatory Commission should consider three specific tasks to take into account effects of the proposed action to grant the license renewal (Delaware SHPO 2001):

(1) "the restoration of the depth and width of the Feeder Canal across the transmission line;

(2) the construction of a simple bridge to permit vehicular access across the Feeder Canal for routine transmission line right-of-way maintenance; and,

(3) monitoring of the transmission line right-of-way to prevent uncontrolled crossing of the Feeder Canal by dirt bikes and ATVs and the repair of damage resulting from such uncontrolled crossings, if they do occur."

These requests fall into two categories. First, an action to correct a perceived negative result of past operations (Number 1, above). Second, specific actions to prevent future deterioration of the feeder canal (Numbers 2 and 3, above). The NRC staff provided the recommendations provided them to the applicant, however, the staff has determined that these actions do not relate to the current Federal undertaking, a decision under consideration by the Nuclear Regulatory Commission to extend operating licenses.

The applicant stated that, for the license renewal period, (1) "No major structural modifications have been identified…" (2) "Any maintenance activities necessary to support license renewal would be limited to previously disturbed areas;" and, (3) "No additional land disturbance is anticipated in support of license renewal." (PECO Nuclear 2000a, 2000b, and 2000c). The applicant should reflect the aforementioned in its licensing basis commitments and, under such conditions, staff believes continued operation of Peach Bottom would not have an effect on any known or on potential unknown or undiscovered historic or archaeological resources located in areas of potential effect.

The historically important Chesapeake and Delaware Feeder Canal occurs within the Delaware portion of the Peach Bottom-to-Keeney, Delaware transmission line. However, since the applicant does not own and does not perform operational or maintenance work on the part of the transmission line that contains the feeder canal (Exelon Nuclear 2002), it has no opportunity to take the value of this resource into account during operation and maintenance work. Given the commitments of the applicant to limit land disturbances in support of license renewal, the staff concludes that the impact of operation and maintenance of the Peach Bottom site during the license renewal period are SMALL. It requires no further mitigation.

4.4.6 Environmental Justice

Environmental justice refers to a Federal policy in which Federal actions should not result in disproportionately high and adverse impacts on minority[a] or low-income populations. Executive Order 12898 (59 FR 7629) directs Federal executive agencies to consider environmental justice under the National Environmental Policy Act of 1969 (NEPA). The Council on Environmental Quality (CEQ) has provided guidance for addressing environmental justice (CEQ 1997). Although it is not subject to the Executive Order, the Commission has voluntarily committed to undertake environmental justice reviews. Specific guidance is provided in NRC Office of Nuclear Reactor Regulation Office Instruction LIC-203, *Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues* (NRC 2001).

For the purpose of the staff's review, a minority population is defined to exist if the percentage of minorities within the Census block groups[b] in each state within the 80 km (50 miles) potentially affected by the license renewal of Peach Bottom Units 2 and 3 exceeds the corresponding percentage of minorities in the state of which it is a part by 20 percent, or if the corresponding percentage of minorities within the Census block group is at least 50 percent. A low-income population is defined to exist if the percentage of low-income population within a census block group exceeds the corresponding percentage of low-income population in the state of which it is a part by 20 percent, or if the corresponding percentage of low-income population within a census block group is at least 50 percent. For census block groups within York and Lancaster counties, for example, the percentage of minority and low-income populations is compared to the percentage of minority and low-income populations in Pennsylvania. Exelon conducted its analysis using 1990 census tracts (USCB 1999) rather than the smaller block groups. Staff used the 2000 Census block groups (USCB 2001) for identifying minority populations, but used the 1990 Census block groups to identify low-income populations because the 2000 Census data on incomes were not yet available for small geographic areas.

(a) The NRC guidance for performing environmental justice reviews defines "minority" as American Indian or Alaskan Native; Asian; Native Hawaiian or other Pacific Islander; or Black races; or Hispanic ethnicity. "Other" races and multi-racial individuals may be considered as separate minorities (NRC 2001).

(b) A census block group is a combination of census blocks, which are statistical subdivisions of a census tract. A census block is the smallest geographic entity for which the Census Bureau collects and tabulates decennial census information. A census tract is a small, relatively permanent statistical subdivision of counties delineated by local committees of census data users in accordance with Census Bureau guidelines for the purpose of collecting and presenting decennial census data. Census block groups are subsets of census tracts (USCB 2001).

The scope of the review as defined in NRC guidance (NRC 2001) should include an analysis of impacts on minority and low-income populations, the location and significance of any environmental impacts during operations on populations that are particularly sensitive, and any additional information pertaining to mitigation. The descriptions to be provided by this review should state whether these impacts are likely to be disproportionately high and adverse, and to evaluate the significance of such impacts.

The staff examined the geographic distribution of minority and low-income populations within 80 km (50 mi) of Peach Bottom Units 2 and 3, encompassing all of York, Lancaster, and Chester counties in Pennsylvania; Baltimore City and County, Harford, Kent, and Cecil counties in Maryland; New Castle County in Delaware; parts of Adams, Cumberland, Dauphin, Lebanon, Montgomery, Delaware, and Berks counties in Pennsylvania; Queen Annes, Anne Arundel, Howard, Caroline, Frederick, and Carroll counties in Maryland; Kent County in Delaware; and Salem and Gloucester counties in New Jersey. The analysis was also supplemented by field inquiries to the planning department and social service agencies in York and Lancaster counties.[(a)]

Exelon conducted its analysis for minority and low income populations using the convention of including the census tracts if at least 50 percent of their area lay within 80-km (50-mi) of Peach Bottom Units 2 and 3 (Exelon 2001a). Using this convention, the 80-km radius included 1201 census tracts. The NRC staff used the more detailed 2000 Census block groups, which resulted in a universe of 3962 block groups, and followed the latest guidance in NRC 2001 for designating minority categories, including “other” races and multiple-race individuals. Exelon used the ”more than 20 percent” criterion to determine whether a census tract should be counted as containing a minority or low-income population (Exelon 2001a). Staff found that the “50 percent” criterion was also applicable at the block group level. Figures 4-1 and 4-2 show the distribution of census block groups for the minority and low-income populations, respectively (shaded areas).

(a) York and Lancaster counties were the focus of this inquiry because all of both counties lie within the 80-km (50-mi) radius and are nearest the Peach Bottom site. The staff concluded that any findings of environmental justice issues in these counties would warrant further field inquiries in more distant counties. For reasons stated later in this section, further investigation was not warranted.

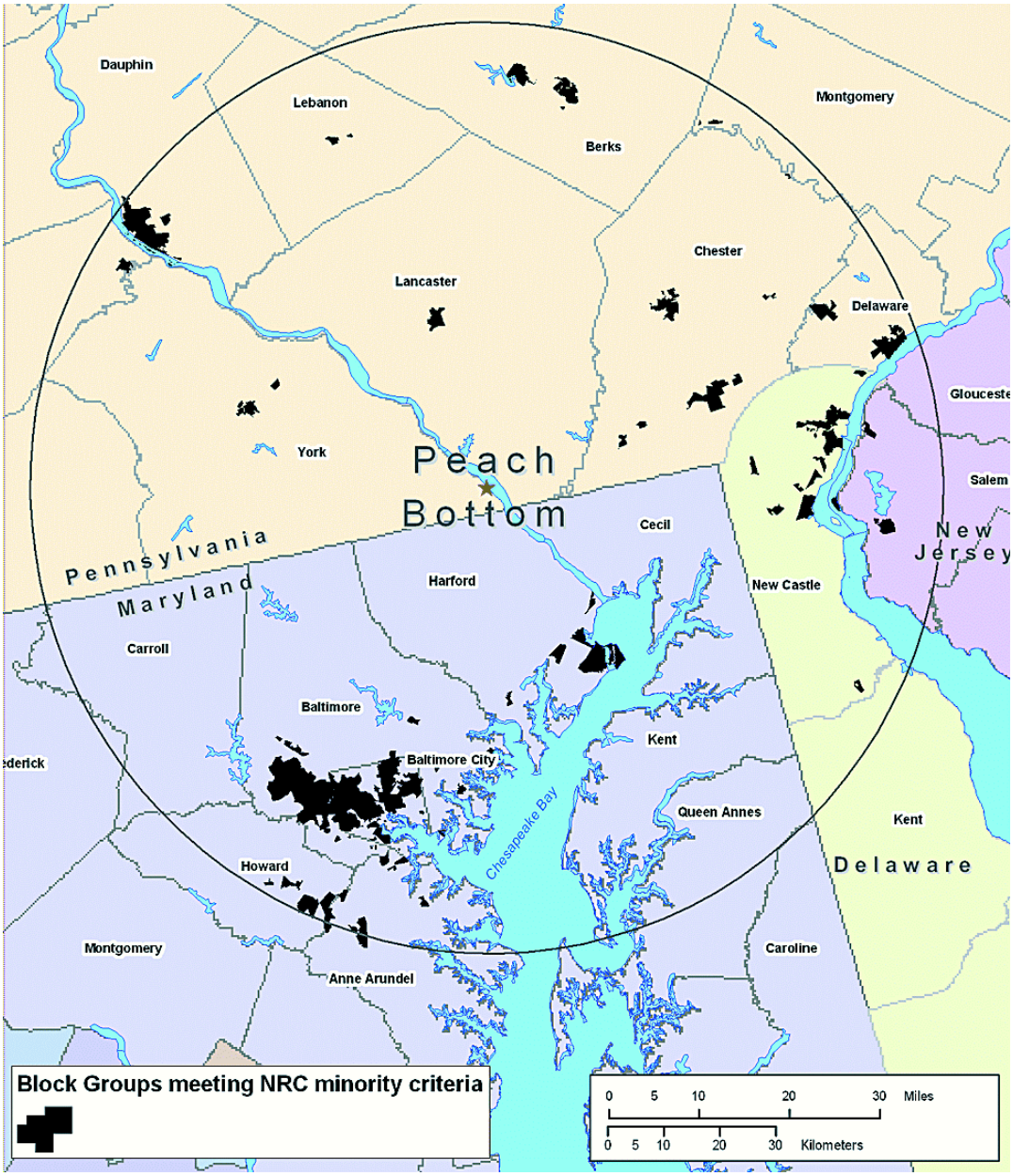

Figure 4-1. Geographic Distribution of Minority Populations (shown in shaded areas) Within 80 km (50 mi) of Peach Bottom Site Based on 2000 Census Block Group Data [(a)]

(a) Note: Some of the census block groups extend into open water.

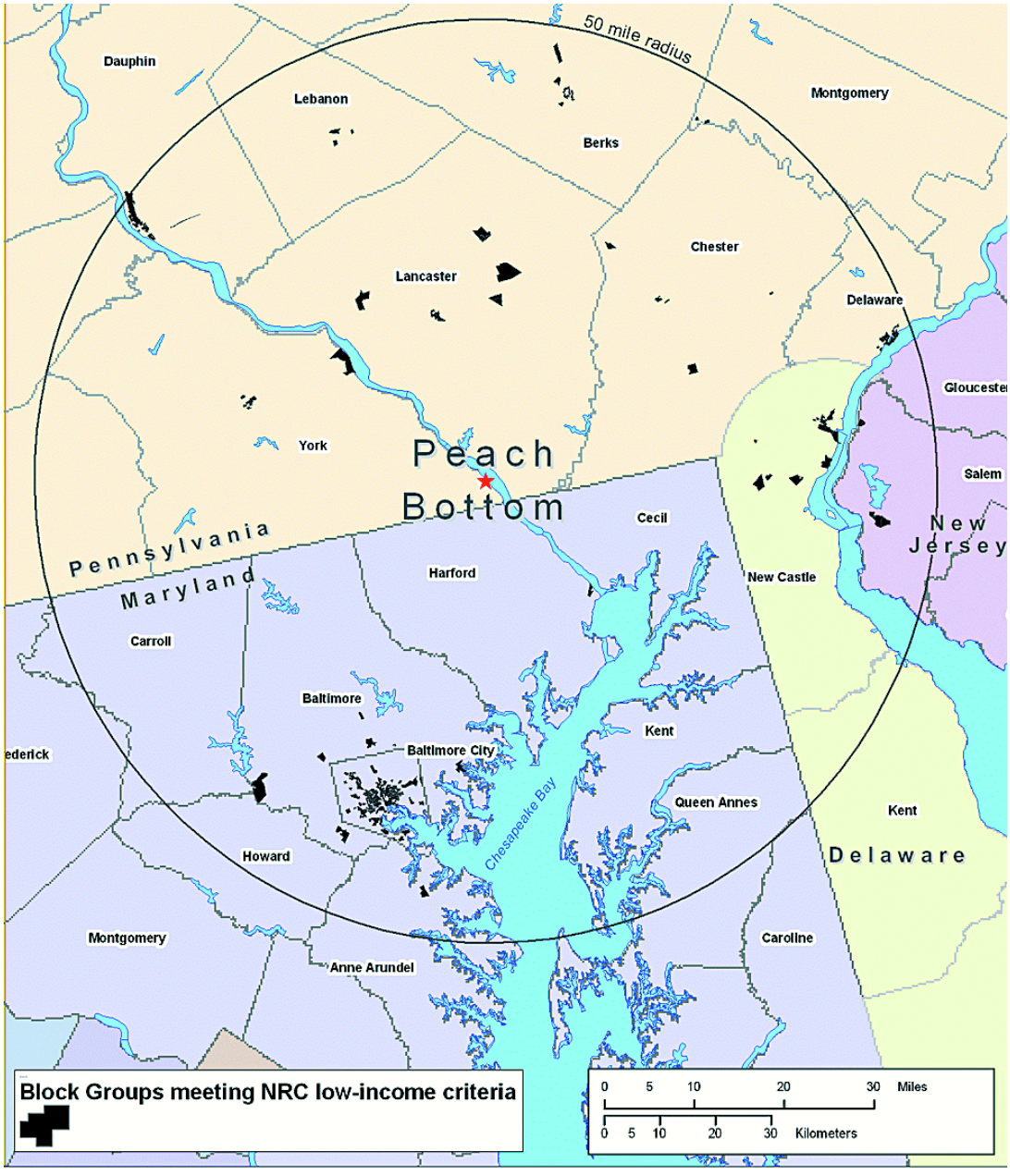

Figure 4-2. Geographic Distribution of Low-Income Populations (shown in shaded areas) Within 80 km (50 mi) of Peach Bottom Site Based on 1990 Census Block Group Data[(a)]

(a) Note: Some of the census block groups extend into open water.

Based on the "more than 20 percent greater" criterion, Exelon determined that Black minority populations exist in 209 census tracts: 21 in Delaware, 136 in Maryland, 4 in New Jersey, and 48 in Pennsylvania. Hispanic minorities exist in 22 tracts: 2 in Delaware, 1 in Maryland, 1 in New Jersey, and 18 in Pennsylvania. Two tracts contain Native American minority populations, one located in Baltimore and the other in West Chester in eastern Pennsylvania. Staff analysis using the 2000 Census confirmed the relative numbers and locations of minority populations in the Exelon analysis, although the number of block groups in the staff's analysis is larger than the number of tracts used by Exelon. Figure 4-1 shows the locations of minority populations.

Black minority populations tend to be concentrated in urban areas, especially in metropolitan Baltimore and Philadelphia. Hispanic minority populations, with the exception of a few block groups, are concentrated in the Cities of Lancaster and Reading.

By the NRC criteria (50 percent of population, or at least 20 percent greater than state), 420 of the total 4271 1990 census block groups within 80 km (50 mi) of the site contain low-income populations. The majority of census block groups that contain low-income populations are located in the Baltimore metropolitan area. The remaining census block groups also tend to be located in urban areas. In Pennsylvania, low-income block groups are concentrated in the Philadelphia metropolitan area, Harrisburg, Reading, Lancaster, and York. In New Jersey, most are in Salem. In Delaware, they are concentrated in Newark and Wilmington. Figure 4-2 shows the locations of the low-income populations.

With the locations of minority and low-income populations identified, the staff proceeded to evaluate whether any of the environmental impacts of the proposed action could affect these populations in a disproportionate manner. Based on staff guidance (NRC 2001), air, land, and water resources within about 80 km (50 mi) of the Peach Bottom site were examined. Within that area, a few potential environmental impacts could affect human populations; all of these were considered SMALL for the general population. These include:

- groundwater-use conflicts (discussed in Section 4.5)
- electric shock (discussed in Section 4.2.1)
- microbiological organisms (discussed in Section 4.1.5)
- postulated accidents (discussed in Chapter 5 of this SEIS and Chapter 5 of the GEIS)

The pathways through which the environmental impacts associated with Peach Bottom Units 2 and 3 license renewal can affect human populations are discussed in each associated section. The staff then evaluated whether minority and low-income populations could be disproportionately affected by these impacts. The staff found no unusual resource dependencies or practices, such as subsistence agriculture, hunting, or fishing through which the populations could be disproportionately affected. In addition, the staff did not identify any location-dependent disproportionate impacts affecting these minority and low-income populations. The staff concludes that offsite impacts from Peach Bottom Units 2 and 3 to minority and low-income populations would be SMALL, and no additional mitigation actions are warranted.

4.5 Groundwater Use and Quality

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 applicable to Peach Bottom Units 2 and 3 groundwater use and quality is identified in Table 4-8. Exelon stated in its ER (Exelon 2001a) that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 operating licenses (OLs). The staff has not identified any significant new information during its independent review of the ER (Exelon 2001a), the staff's site visit, scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to this issue beyond those discussed in the GEIS. For this issue, the staff concluded that the impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 4-8. Category 1 Issue Applicable to Groundwater Use and Quality During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
GROUNDWATER USE AND QUALITY	
Ground-water-use conflicts (potable and service water; plants that use <100 gpm).	4.8.1.1

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, follows:

- Ground-water-use conflicts (potable and service water; plants that use <100 gpm). Based on information in the GEIS, the Commission found that

  > Plants using less than 100 gpm are not expected to cause any groundwater use conflicts.

  As discussed in Section 2.2.2, Peach Bottom site groundwater use is less than 0.07 m^3/s (100 gpm). The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no groundwater-use conflicts during the renewal term beyond those discussed in the GEIS.

There is one Category 2 issue related to groundwater use and quality that is applicable to Peach Bottom Units 2 and 3. This issue is listed in Table 4-9 and discussed in Section 4.5.1.

Table 4-9. Category 2 Issue Applicable to Groundwater Use and Quality During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
GROUNDWATER USE AND QUALITY			
Ground-water-use conflicts (plants using cooling towers withdrawing makeup water from a small river)	4.8.1.3 4.4.2.1	A	4.5.1

4.5.1 Ground-water-Use Conflicts (Plants Using Cooling Towers Withdrawing Makeup Water From a Small River)

Groundwater use conflicts for plants that have cooling towers withdrawing makeup water from a small river is a Category 2 issue, requiring a site-specific assessment before license renewal. Surface water withdrawals from small water bodies during low-flow conditions may result in groundwater use conflicts with nearby groundwater users.

The impact of consumptive loss on nearby groundwater users is associated with the difference it could potentially cause in aquifer recharge, especially if other new groundwater or upstream

surface water users begin withdrawals. Section 2.2.2 describes Peach Bottom site surface water withdrawals from Conowingo Pond. As described in Section 2.1.3, Peach Bottom Units 2 and 3 normally operate with a once-through cooling system. However, since groundwater flows towards Conowingo Pond, groundwater withdrawals would not be impacted by changes in river flow.

The staff reviewed the CWA Section 316(a) Demonstration for Peach Bottom Units 2 and 3 and the ER relative to potential groundwater-use conflicts due to consumptive loss of aquifer recharge. Based on this review, the staff has concluded that the potential impacts are SMALL, and additional mitigation is not warranted.

4.6 Threatened or Endangered Species

Threatened or endangered species are listed as a Category 2 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1. This issue is listed in Table 4-10.

Table 4-10. Category 2 Issue Applicable to Threatened or Endangered Species During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS)			
Threatened or endangered species	4.1	E	4.6

This issue requires consultation with appropriate agencies to determine whether threatened or endangered species are present and whether they would be adversely affected. Exelon initiated consultation under Section 7 of the Endangered Species Act during June 2000 with a request for information to the National Marine Fisheries Service (NMFS) concerning species potentially occurring near the Peach Bottom site. The presence of threatened or endangered species in the vicinity of the Peach Bottom site is discussed in Sections 2.2.5 and 2.2.6.

Exelon has no plans to conduct refurbishment or construction at the Peach Bottom site during the license renewal period. Therefore, there would be no refurbishment-related impacts to special status species, and no analysis of refurbishment-related impacts is needed. For the

reasons set forth below, the staff concludes that the impact on endangered, threatened, or candidate species of an additional 20 years of operation and maintenance of the Peach Bottom Plant and associated transmission lines would be SMALL, and further mitigation is not warranted.

4.6.1 Aquatic Species

During more than 30 years of monitoring the fish populations of Conowingo Pond, no Federally listed fish species have been collected. The Atlantic sturgeon (*Acipenser oxyrhynchus*), a candidate for federal listing has been captured by anglers in the lower Susquehanna River below the Conowingo Dam in Maryland (Normandeau Associates, Inc. 1998), but apparently has not been collected upstream of the Dam in Pennsylvania since the Conowingo Dam was built. The Atlantic sturgeon is listed as endangered by Pennsylvania. Based on a review of Philadelphia Electric Company and PECO impact assessment documents (AEC 1973; PECO 1975), Exelon (as PECO)-funded research and monitoring studies (Normandeau 1998, 1999, 2000), standard fisheries references, journal articles, and government web sites (Normandeau 1999), two State-listed fish species (in addition to the Atlantic sturgeon) could be found in Conowingo Pond. One, the anadromous hickory shad *(Alosa mediocri*s), is found seasonally below Conowingo Dam, as adults ascend the river to spawn in spring (Normandeau 1998). Occasionally, small numbers of hickory shad (32 in 1999) are collected at the Conowingo West Lift (Susquehanna River Anadromous Fish Restoration Cooperative 2000). Another State-listed species, the cisco *(Coregonus artedi)* has been introduced to the upper Susquehanna River (Harvey's Lake in Luzeme County, Pennsylvania) (Normandeau 2000) and the lower Susquehanna River (downstream of the Conowingo Dam in Maryland) (Normandeau 1998) and has been reported from Conowingo "Reservoir" (Normandeau 1999). However, the cisco has not been collected from Conowingo Pond and is not believed to be present. State- or Federal-listed molluscs have not been found in Conowingo Pond.

Based on its review of the applicant's ER and its own independent analysis summarized above, the staff concludes that continued operation of Peach Bottom Units 2 and 3 during the renewal term will have no effect on Federally listed aquatic species.

4.6.2 Terrestrial Species

Exelon initiated consultation with the U.S. Fish and Wildlife Service (FWS) in October 2000 with a letter requesting information and describing recently completed bog turtle surveys. The FWS responded with an indication that there were likely to only be transient species in the vicinity of

the plant and that adverse effects were unlikely (Exelon 2001b). The staff further evaluated the potential impacts of continued operation of Peach Bottom Units 2 and 3 on the bald eagle and other Federally listed species that may occur near the plant or the transmission line (see Section 2.2.6). The staff evaluated the available information concerning these species and determined that continued operation of Peach Bottom Units 2 and 3 during the license renewal term was not likely to adversely affect the bald eagle and likely to have no effect on any other Federally listed endangered or threatened species. This conclusion was forwarded to the FWS on January 17, 2002. The FWS concurred with the staff's conclusions in a letter dated April 17, 2002. Copies of these correspondence are provided in Appendix E.

Based on its review of the applicant's ER and its independent analysis summarized above the staff concluded that continued operation of the plant under license renewal is not likely to adversely affect the bald eagle or bog turtle, and will have no effect on other listed or proposed endangered or threatened terrestrial species within the immediate vicinity of the Peach Bottom site or the associated transmission line.

4.7 Evaluation of Potential New and Significant Information on Impacts of Operations During the Renewal Term

4.7.1 Evaluation of Potential New and Significant Radiological Impacts on Human Health

During the public scoping period for the Peach Bottom Units 2 and 3 SEIS, there were comments about the studies related to strontium-90 radiation levels in deciduous (baby) teeth and use of these studies as "in-body" measurements of radioactive materials. The commenters suggested that the source of this material was the Peach Bottom plant and that this is new and significant information and, therefore, should be considered in the environmental impact evaluation for Peach Bottom Units 2 and 3, specifically with respect to public health. This section (1) summarizes the comments related to strontium-90 in deciduous teeth obtained during the public scoping period and (2) discusses why the staff determined that "in-body" measurements of strontium-90 in deciduous teeth as a means to evaluate public health impacts from releases from nuclear power plants is not new and significant information.

The staff has evaluated whether any of the comments related to strontium-90 in the environment could be new and significant with respect to the conclusions in the GEIS. In 2000, a report titled *Strontium-90 in Deciduous Teeth as a Factor in Early Childhood Cancer* was

published (Gould et al. 2000) that alleges there was an increase in cancer incidence due to strontium-90 released from nuclear power facilities. The evidence claimed in the report was elevated levels of strontium-90 in deciduous teeth. The staff has determined that the report does not represent new information with regard to the Category 1 issues as evaluated in the GEIS, nor does it identify a significant departure from what was specifically documented in the GEIS with regard to public dose. This section addresses the claims by the Radiation and Public Health Project (RPHP) staff, which were the authors of the Gould report. The staff has determined that the strontium-90 found in deciduous teeth in the vicinity of Peach Bottom Units 2 and 3 is not due to releases from the plant and that the operation of Peach Bottom Units 2 and 3 would not be responsible if there were to be an increased incidence of cancer in the area.

4.7.1.1 Summary of Comments

During the scoping process, there were comments both written and verbal at the public meeting related to the work by Gould et al. and the RPHP (Mangano et al. 2001). The comments focused on several issues identified by the Gould study. The first issue was use of “in-body” measurement of radionuclides to determine public health effects. The second issue was use of strontium-90 to perform “in-body” measurement to evaluate the potential health risks from release of radioactive materials from Peach Bottom Units 2 and 3. The third major issue described was an apparent increase in cancer incidence in the communities near Peach Bottom Units 2 and 3. Finally, commenters suggested that a cause-and-effect relationship exists between reactor operation, catastrophic events, and perceived increase in cancer rates.

The discussion that follows explains the basis for the staff’s conclusion that the public scoping comments do not provide new and significant information related to the Category 1 radiological human health issues. The discussion (1) explains the source and amount of strontium-90 in the environment, (2) describes the consensus standards of national and international organizations that form the basis of NRC’s regulations related to protecting public health, (3) addresses the radiological monitoring programs at nuclear power reactors and specifically the program at Peach Bottom Units 2 and 3, (4) explains why “in-body” measurement of radioactive materials is not used to determine public health impacts, (5) addresses the statements regarding cancer incidence discussed in the Gould report and public comment, and (6) addresses the implication that radioactive effluents from nuclear reactors are the cause of perceived increases in cancer incidence near Peach Bottom Units 2 and 3. Finally, the rationale for assigning radiological issues as Category 1 in the GEIS and the staff’s evaluation of these issues for Peach Bottom Units 2 and 3 are briefly discussed.

4.7.1.2 Strontium-90 in the Environment

There are three sources of strontium-90 in the environment: fallout from nuclear weapons testing, releases from the Chernobyl accident in the Ukraine, and potential releases from nuclear power reactors. By far the largest source of strontium-90 in the environment is from weapons testing fallout.

Both strontium-89 and strontium-90 were released to the atmosphere by aboveground explosions of nuclear weapons (UNSCEAR 2001). Although the United States performed its last atmospheric test of a nuclear weapon in 1963, other countries continued to perform atmospheric testing of nuclear weapons until 1980 (UNSCEAR 2001). Strontium-89 has a half-life of 50.5 days, while the half-life of strontium-90 is 28.8 years. Consequently, virtually no strontium-89 currently remains in the soil from nuclear weapons testing (Eisenbud 1987). In contrast, strontium-90 remains in soils of the Northern Hemisphere at more than 50% of its peak levels in the 1960s (UNSCEAR 2000). Approximately 622 PBq (16.8 million Ci) of strontium-90 were produced and globally dispersed in atmospheric nuclear weapons testing.

Numerous measurements of the global disposition on strontium-90 and the occurrence of these and other fallout radionuclides in foodstuffs and the human body were made at the time the atmospheric tests were taking place. The worldwide average effective dose from ingesting strontium-90 (1945 to date) is 97 μSv (9.7 mrem). The worldwide average effective dose from inhaling strontium-90 (1945 to 1985) is 9.2 μSv (0.92 mrem). No statistically significant excess of biological effects due to strontium-90 exposures at levels characteristic of worldwide fallout has been demonstrated (NCRP 1991).

The other two sources of strontium-90 in the environment are the Chernobyl accident in April 1986 when approximately 8 PBq (216,000 Ci) of strontium-90 were released into the atmosphere, and releases from nuclear power reactor operations. The total annual release of strontium-90 into the atmosphere from all U.S. nuclear power plants is typically 37 MBq (0.001 Ci). The amount of strontium-90 released into the environment from a nuclear facility is so low that the only chance of detecting strontium-90 is sampling the nuclear power plant effluents themselves. In addition to strontium-90, power reactors also release very small quantities of strontium-89.

Because of the extremely small amount of strontium-90 released from nuclear power plant effluents, it is unlikely that strontium-90 found in deciduous teeth would be from nuclear power plants. Without determining that there is strontium-89 in the teeth, it is impossible to tell where

the strontium-90 is from. If there is no strontium-89 in the teeth, then it is unlikely that the strontium-90 is from a recent release from a nuclear reactor. The fact that the RPHP has failed to measure the strontium-89 to strontium-90 ratio in any deciduous teeth collected limits conclusions regarding the source of the internal contamination.

4.7.1.3 Regulatory Basis and Discussion of Risk

The evaluation of health effects from exposure to radiation, both natural and man-made, is an ongoing activity involving public, private, and international institutions. International and national organizations such as the International Commission on Radiological Protection (ICRP) and National Council on Radiation Protection and Measurements (NCRP) provide consensus standards developed from recent and ongoing research. NRC's regulatory limits for effluent releases and subsequent dose to the public are based on the radiation protection recommendations of these organizations. NRC provides oversight of all licensed commercial nuclear reactors to ensure that regulatory limits for radiological effluent releases and the resulting dose to the public from these releases are within the established limits. The regulations related to radiological effluents and dose to the public can be found in 10 CFR Part 20 and 10 CFR Part 50, Appendix I.

The National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation (BEIR) published its fifth report (BEIR V) just over a decade ago (National Research Council 1990). That report contains mathematical models that predict risk of radiation-induced cancers in human populations over and above the incidence of cancer that occurs in the absence of radiation exposure. The BEIR V committee chose a linear, nonthreshold (LNT) dose-response model for solid cancers and a linear-quadratic (LQ) model for leukemia.

The BEIR V report does not address what is safe or not safe; it merely evaluates excess cancer risk in terms of probabilities. ICRP Publication 60 (1991), however, does define safe in the sense of "acceptable risk," and this and similar definitions have been reaffirmed by the NCRP (NCRP 1993) and the U.S. Environmental Protection Agency (EPA 1987). These implicit definitions of "safe" are embodied in all U.S. radiation protection regulations, including those of the NRC.

There is no human activity without some risk, however slight, so "safe" does not mean "with no risk," but rather "safe" means "with an acceptably tiny risk." What risk is acceptable from society's standpoint is determined by the political process in the United States as spelled out

recently, for example, by the U.S. Presidential/Congressional Commission on Risk Assessment and Risk Management[(a)] (Omenn et al. 1997).

4.7.1.4 Effluent Monitoring at Peach Bottom

Regulatory Guide 1.21 recommends that "a quarterly analysis for strontium-89 and strontium-90 should be made on a composite of all filters from each sampling location collected during the quarter." The sensitivity is such that the analysis for radioactive material in particulate form should be sufficient to permit measurement of a small fraction of the activity, which would result in annual exposures of 200 μSv (20 mrem) to any organ of an individual, or 60 μSv (6 mrem) to the whole body, in an unrestricted area (see Section 2.1.4). Nuclear power plants, including Peach Bottom Units 2 and 3, routinely release small amounts of radioactive material in their effluents. To demonstrate that the plant is within the regulatory limits, the plants monitor the radiological materials released to the environment and take frequent radiological samples around the plant site as well as analyze their effluent discharge. Both strontium-89 and strontium-90 can be found in power plant effluents in very small quantities. Each nuclear power plant in the United States is required to submit an annual report on effluent releases to NRC. The report contains information about the types and quantities of radionuclides that are released to the environment, as well as the dose impact on the environment.

Gaseous and liquid effluent releases are monitored at Peach Bottom Units 2 and 3 to demonstrate that they are within regulatory limits. The licensee also has a Radioactive Effluents Control Program, including the Offsite Dose Calculation Manual that provides the procedures for monitoring releases to the environment. The results of this monitoring are provided to NRC in annual reports titled *Annual Radioactive Effluent Release Report* (Exelon 2001b) and *Annual Radiological Environmental Operating Report* (Exelon 2001c). The effluent control program was reviewed for the preparation of this SEIS. The releases of radionuclides to the environment, including strontium-90, are monitored as prescribed by Peach Bottom Units 2 and 3 *Offsite Dose Calculation Manual* (PECO 2001) and have been maintained well below regulatory limits. During 2000, Peach Bottom Units 2 and 3 did not release detectable levels of strontium-90 or strontium-89 in the gaseous effluents. Liquid effluents containing radioactive materials, including strontium-90 and strontium-89, were released into the discharge canal. The only time radioactive strontium was released in detectable levels in the liquid effluents was during the third and fourth quarters of 2000. In the third quarter a total of 0.54 MBq (1.46×10^{-5} Ci) of strontium-89 was released. In the fourth quarter the effluents were 4.3×10^{-3}

(a) Internet http://www.riskworld.com.

Mbq (1.16×10^{-7} Ci) of strontium-89 and 4.48×10^{-4} MBq (1.21×10^{-8} Ci) of strontium-90 (Exelon 2001c). These total amounts of radioactive effluents released from Peach Bottom Units 2 and 3 were only a small fraction of the NRC regulatory limits. The quantities of materials released to the atmosphere and liquid for 2000 are comparable to the quantities released in the past 5 years and the expected quantities released in years to come, including the license renewal period.

4.7.1.5 Use of "In-Body" Radionuclide Measurements to Assess Public Risk from Radiological Effluents from Peach Bottom Units 2 and 3

Scoping comments have stated or implied that the NRC should measure radioactive substances in persons living near nuclear power plants. Such measurements would be misleading and unwarranted for a variety of reasons:

- Radioactive substances may come from a variety of sources. In the case of strontium-90, the primary source has always been fallout from atmospheric weapons tests (UNSCEAR 2001). The scoping comments that imply that strontium-90 measured in people near nuclear plants must have come from nuclear plants has no basis.

- Interpreting measurements of radioactive materials in people is difficult unless one knows what each individual was exposed to, when the exposures occurred, and by what routes they occurred (ingestion, inhalation, etc.). In particular for strontium-90, dietary contributions from foodstuffs produced out of the region must be considered. Finally, human migration must be considered, because people may have lived and acquired radionuclides elsewhere than near a nuclear power plant.

- Substances in the human body are dynamic, not static. This includes radioactive and nonradioactive substances. The dynamic processes include intake of material; uptake to systemic circulation from the gastrointestinal tract, respiratory tract, or skin; translocation throughout the body system; retention over time; and elimination via excretion and radioactive decay. Thus, even in deciduous teeth, the time course of exposure leading to intake and all other dynamic processes must be considered to interpret measurements.

4.7.1.6 Ability for Strontium-90 to Cause Cancer

Scoping comments emphasized the adverse health effects of strontium-90. This isotope is produced in roughly 5.8% of nuclear fissions in a reactor's fuel elements and undergoes radioactive decay with a half-life of almost 29 years. Strontium-90, and its radioactive decay product yttrium-90, are not harmful unless they are near or inside the body. They are easily shielded if outside the body, resulting in no radiation exposure.

If ingested, strontium-90 tends to mimic calcium when it is in the body and therefore becomes concentrated in calcified tissues such as bones and teeth. If ingested in quantities that produce very large radiological dose rates (about one thousand times higher than dose rates we all receive from natural background [Raabe 1994]), strontium-90 is known to increase the risk of bone cancer and leukemia in animals, and is presumed to do so in people. Below these dose rates, there is no evidence of any excess cancer.

Compared to other radionuclides, both natural and human-made, strontium-90 is not the most toxic. For example, naturally occurring thorium 230 is 700 times more radiotoxic when inhaled.

4.7.1.7 Cause-and-Effect Relationship Between Radiological Releases from Peach Bottom Units 2 and 3 and Increased Incidence in Cancers in the Area

Scoping comments on the Peach Bottom SEIS have stated or implied that claimed statistical associations between cancer rates and reactor operations are cause-and-effect relationships. Considerable of technical literature has addressed causal association, that is, when two things that appear to be associated over time can lead one to deduce that one causes the other.

A simple counterexample helps illustrate this point. A college professor gives the following example of a causal inference: "In the winter I wear galoshes. In the winter I get colds. Therefore, galoshes cause colds." There's no argument that a strong statistical association exists between wearing galoshes and the health effect of colds. However, there is an argument about whether galoshes *cause* colds. So, how does one go about addressing whether this association is really causation?

Here are some of the major factors to consider before inferring that a statistical association is a causal one (Hill 1965):

(1) Strength: Is a large effect observed, e.g., 32-fold lung cancer increase in heavy smokers?

(2) Consistency: Is the effect consistently observed across studies?

(3) Specificity: Does the effect occur in specific persons, for particular sites and types of disease.

(4) Temporality: Does exposure precede disease? Is there a suitable latent period between exposure and clinical symptoms?

(5) Biological Gradient: Is there a dose-response curve in which increasing dose leads to increasing response?

(6) Biological Plausibility: Is there a plausible biological mechanism for the observed association?

(7) Coherence: Does the cause-and-effect inference seriously conflict with generally known facts of the natural history and biology of the disease?

(8) Experiment: Does intervention reduce or prevent the association?

(9) Analogy: Do other, similar agents produce the effects?

Statistical association alone does not prove causation. The RPHP work fails to meet many of these criteria, even if the strontium-90 measurements were the result of the nuclear power plant operations. In particular, they fail to meet criteria 1, 2, 3, 4, and 6.

Epidemiology is the study of patterns of health and disease in human populations. In 1995, an international group of experts assembled to help determine how to use epidemiology studies for risk assessments. Their work has been published (Federal Focus Inc. 1996) and a non-copyrighted summary is on the internet at http://www.pnl.gov/berc/epub/risk/index.html.

A disease cluster is a group of cases of a disease that appear around the same time in a limited geographic or occupational area. A non-technical analysis of "the cancer-cluster myth" has been published in a popular magazine (Gawande 1999). Gawande explains why infectious disease clusters can and should spur immediate investigations and perhaps intervention by public health officials, and yet why non-infectious disease clusters rarely, if ever, are verified (see, for example, Neutra 1990 and Reynolds et al. 1996). For cancer, which has a significant latency between exposure and appearance of clinical symptoms, apparent clusters are very misleading because of migration and confounding sources of exposure.

4.7.1.8 Additional Discussion on Cancer

Information regarding the relationships between environmental exposure to radiation and cancer as stated in the Gould report were not substantiated. One form of cancer the Gould report linked to strontium-90 exposure is "the extremely rare form of childhood cancer known as rhabdomyosarcoma" (Gould et al. 2000). Rhabdomyosarcoma is not rare; indeed it is the most common soft tissue sarcoma in children (ACS 2001a), and is the fifth most common form of pediatric cancer (St. Jude Children's Research Hospital 2001). Furthermore, no association has been documented between the incidence of rhabdomyosarcoma and any environmental condition, including toxic substances, air or water pollution, or radiation exposure (ACS 2001a).

While the Gould report is correct with regard to the general increase in cancer incidence in the United States (Gould et al. 2000), this increase does not appear to be due to environmental causes other than cigarette smoking. The National Cancer Institute (NCI 2001) states that

> It is true that a person's chance of developing cancer within his or her lifetime is almost twice as great today as it was half a century ago, which means that doctors are seeing more cases of cancer than they did in the past. However, this increase is caused largely by the facts that people are living longer and cancer is more prevalent in older people. When corrected for the increasing average age of the population, cancer rates in the United States have actually been stable or even falling slightly in the past several years. Much of the rise prior to that was due to cigarette smoking, a well established and avoidable cause of cancer.

The American Cancer Society (ACS) (ACS 2001b) acknowledges that a dramatic increase in prostate cancer was noted between 1989 and 1992, but notes that this increase was apparent rather than real. They suggest that it was due to earlier diagnosis in men without any

symptoms by increased use of prostate-specific antigen (PSA) blood test screening. They note that prostate cancer incidence rates have declined significantly since 1992 (ACS 2001b).

With regard to cancer clusters, especially breast cancer deaths, that are identified by the Gould report (Gould et al. 2000), detailed studies of this phenomenon have yet to substantiate relationships with environmental exposures, especially from nuclear power plants. Scientists from the NCI conducted and are conducting studies of breast cancer death clusters in the northeastern United States, the Washington D.C. area, and San Francisco. Primary factors driving the observed differences appear to be regional differences in the ages of mothers at first birth and mammography screening (Sturgeon et al. 1995).

At the request of Congress, the NCI conducted a study of cancer mortality rates around 52 nuclear power plants, 9 DOE facilities, and 1 former commercial fuel reprocessing facility. The study covered the period from 1950 to 1984 and evaluated the change in mortality rates before and during facility operations. The study (Jablon, Hrubec, and Boice 1991) concluded the following:

> From the evidence available, this study has found no suggestion that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancers in populations living nearby.

Additionally, the ACS (ACS 2001c) has concluded that although reports about cancer case clusters in such communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population. Likewise, there is no new evidence that links strontium-90 with increases in breast cancer, prostate cancer, or childhood cancer rates. The ACS recognizes that public concern about environmental cancer risks often focuses on risks for which no carcinogenicity has been proven or on situations where known carcinogen exposures are at such low levels that risks are negligible. “Ionizing radiation emissions from nuclear facilities are closely controlled and involve negligible levels of exposure for communities near such plants.“ (ACS 2001c).

4.7.1.9 Conclusion

In the GEIS, radiation exposure to the public during the license renewal term was considered a Category 1 issue (see Chapter 1 and Section 4.3 for discussions of Category 1 issues and radiological impacts from normal operations). The GEIS determined that the risk to the public from continued operation of a nuclear plant would not increase during the license renewal term.

Doses to members of the public from Peach Bottom Units 2 and 3 emissions were specifically evaluated in Section 4.3 of the GEIS, using data from monitored emissions and ambient monitoring, and were found to be well within regulatory limits.

The staff extensively reviewed the Gould report, the comments received during the public scoping period, and the written comments provided by the RPHP. The staff has concluded that the claims of elevated levels of childhood cancer in the vicinity of the plant caused by the release of strontium-90 during routine operations are unfounded and without scientific merit. In-plant monitoring of effluent streams has established that there are no significant releases of strontium-90 from the plant. No causal relationship has been established between the levels of strontium-90 being reported by the RPHP in deciduous teeth and childhood cancer. Furthermore, there is near unanimous consensus among the scientific community on the adequacy of current radiation protection standards.

The staff concludes that the information provided from the Gould report and subsequent scoping comments do not provide any information that can be considered new and significant with respect to the findings of the GEIS on the health effects to the public from radiological effluent releases due to the Peach Bottom Units 2 and 3.

4.8 Summary of Impacts of Operations During the Renewal Term

Neither Exelon nor the staff is aware of information that is both new and significant related to any of the applicable Category 1 issues associated with Peach Bottom Units 2 and 3 operation during the renewal term. Consequently, the staff concludes that the environmental impacts associated with these issues are bounded by the impacts described in the GEIS. For each of these issues, the GEIS concluded that the impacts would be SMALL and that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

Plant-specific environmental evaluations were conducted for 13 Category 2 issues applicable to Peach Bottom operation during the renewal term and for environmental justice and chronic effects of electromagnetic fields. For 13 issues and environmental justice, the staff concluded that the potential environmental impact of renewal term operations of Peach Bottom Units 2 and 3 would be of SMALL significance in the context of the standards set forth in the GEIS and that further mitigation would not be warranted. In addition, the staff determined that a consensus has not been reached by appropriate Federal health agencies regarding chronic adverse effects from electromagnetic fields. Therefore, no evaluation of this issue is required.

4.9 References

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10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy,* Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

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5.0 Environmental Impacts of Postulated Accidents

Environmental issues associated with postulated accidents are discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999a).[(a)] The GEIS includes a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) Single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria for Category 1, and therefore, additional plant-specific review of these issues is required.

This chapter describes the environmental impacts from postulated accidents that might occur during the license renewal term.

5.1 Postulated Plant Accidents

Two classes of accidents are evaluated in the GEIS. These are design-basis accidents (DBAs) and severe accidents, as discussed below.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and Addendum 1.

5.1.1 Design-Basis Accidents

In order to receive NRC approval to operate a nuclear power facility, an applicant must submit a safety analysis report (SAR) as part of its application. The SAR presents the design criteria and design information for the proposed reactor and comprehensive data on the proposed site. The SAR also discusses various hypothetical accident situations and the safety features that are provided to prevent and mitigate accidents. The NRC staff reviews the application to determine whether the plant design meets the Commission's regulations and requirements and includes, in part, the nuclear plant design and its anticipated response to an accident.

DBAs are those accidents that both the licensee and the NRC staff evaluate to ensure that the plant can withstand normal and abnormal transients, and a broad spectrum of postulated accidents without undue hazard to the health and safety of the public. A number of these postulated accidents are not expected to occur during the life of the plant, but are evaluated to establish the design basis for the preventive and mitigative safety systems of the facility. The acceptance criteria for DBAs are described in 10 CFR Part 50 and 10 CFR Part 100.

The environmental impacts of DBAs are evaluated during the initial licensing process, and the ability of the plant to withstand these accidents is demonstrated to be acceptable before issuance of the operating license (OL). The results of these evaluations are found in license documentation such as the staff's Safety Evaluation Report (SER), the Final Environmental Statement (FES), the licensee's Updated Final Safety Analysis Report (UFSAR), and Section 5.1 of this supplemental environmental impact statement (SEIS). The licensee is required to maintain the acceptable design and performance criteria throughout the life of the plant including any extended-life operation. The consequences for these events are evaluated for the hypothetical maximum exposed individual; as such, changes in the plant environment will not affect these evaluations. Because of the requirements that continuous acceptability of the consequences and aging management programs be in effect for license renewal, the environmental impacts as calculated for DBAs should not differ significantly from initial licensing assessments over the life of the plant, including the license renewal period. Accordingly, the design of the plant relative to DBAs during the extended period is considered to remain acceptable and the environmental impacts of those accidents were not examined further in the GEIS.

The Commission has determined that the environmental impacts of DBAs are of SMALL significance for all plants because the plants were designed to successfully withstand these accidents. Therefore, for the purposes of license renewal, design-basis events are designated as a Category 1 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1. The early

resolution of the DBAs make them a part of the current licensing basis of the plant; the current licensing basis of the plant is to be maintained by the licensee under its current license and, therefore, under the provisions of 10 CFR 54.30, is not subject to review under license renewal. This issue, applicable to Peach Bottom Units 2 and 3, is listed in Table 5-1.

Table 5-1. Category 1 Issue Applicable to Postulated Accidents During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
POSTULATED ACCIDENTS	
Design-basis accidents	5.3.2; 5.5.1

Exelon Generation Company, LLC (Exelon) stated in its Environmental Report (ER; Exelon 2001) that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 OLs. The staff has not identified any significant new information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to this issue beyond those discussed in the GEIS.

5.1.2 Severe Accidents

Severe nuclear accidents are more severe than DBAs because they could result in substantial damage to the reactor core, whether or not there are serious offsite consequences. The GEIS assessed the impacts of severe accidents during the license renewal period, using the results of existing analyses and site-specific information to conservatively predict the environmental impacts of severe accidents for each plant during the renewal period.

Based on information in the GEIS, the Commission found that

> The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.

Therefore, the Commission has designated mitigation of severe accidents as a Category 2 issue in 10 CFR Part 51, Subpart A, Appendix B, Table B-1. This issue, applicable to Peach Bottom Units 2 and 3, is listed in Table 5-2.

Table 5-2. Category 2 Issue Applicable to Postulated Accidents During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Sections	10 CFR 51.53(c)(3)(ii) Subparagraph	SEIS Section
POSTULATED ACCIDENTS			
Severe Accidents	5.3.3; 5.3.3.2; 5.3.3.3; 5.3.3.4; 5.3.3.5; 5.4; 5.5.2	L	5.2

The staff has not identified any significant new information with regard to the consequences from severe accidents during its independent review of the Exelon ER (Exelon 2001), the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of severe accidents beyond those discussed in the GEIS. However, in accordance with 10 CFR 51.53(c)(3)(ii)(L), the staff has reviewed severe accident mitigation alternatives (SAMAs) for Peach Bottom Units 2 and 3. The results of its review are discussed in Section 5.2.

5.2 Severe Accident Mitigation Alternatives

10 CFR 51.53(c)(3)(ii)(L) requires that license renewal applicants consider alternatives to mitigate severe accidents if the staff has not previously evaluated severe accident mitigation alternatives (SAMAs) for the applicant's plant in an environmental impact statement (EIS) or related supplement or in an environmental assessment. The purpose of this consideration is to ensure that plant changes (i.e., hardware, procedures, and training) with the potential for improving severe accident safety performance are identified and evaluated. SAMAs have not been previously considered for Peach Bottom Units 2 and 3; therefore, the following addresses those alternatives.

5.2.1 Introduction

Exelon submitted an assessment of SAMAs for Peach Bottom Units 2 and 3 as part of the ER (Exelon 2001). This assessment was based on the current Peach Bottom Probabilistic Safety Analysis (PSA), a plant-specific adaptation of the offsite consequence analysis performed as part of the NRC-sponsored probabilistic safety assessment for Peach Bottom Units 2 and 3 and documented in NUREG/CR-4551 (NRC 1990b), and insights from the Peach Bottom Individual Plant Examination of External Events (IPEEE) (PECO 1996). In identifying and evaluating potential SAMAs, Exelon considered several SAMA analyses for other plants (Limerick, Watts Bar, Comanche Peak, and Hatch) and other documents that discuss potential plant improvements, such as NUREG-1560 (NRC 1997a) and NUREG-1462 (NRC 1994a). Exelon

identified and evaluated 204 potential SAMA candidates. This list was reduced to 30 unique SAMA candidates by eliminating SAMAs that were either not applicable to Peach Bottom Units 2 and 3, were related to phenomena that are not risk-significant in BWRs, or were similar to other SAMAs being considered. Other SAMAs were excluded because they had already been implemented at Peach Bottom Units 2 and 3. This list was further screened and the remaining SAMAs were evaluated in detail. The study concluded that none of the SAMAs identified would be cost-beneficial.

Based on a review of the SAMA assessment, the NRC issued a request for additional information (RAI) to Exelon by letter dated December 20, 2001 (NRC 2001). Key questions concerned differences between the updated PSA used for the SAMA analysis and earlier risk assessments for Peach Bottom Units 2 and 3, the potential impact of uncertainties and external event risk contributors on the study results, the role of the plant-specific risk study in the SAMA identification process, and the effects of the power uprate on the risk profile. Exelon submitted additional information on January 30, 2002 (Exelon 2002) in response to the RAIs. In these responses, Exelon included supplemental tables showing the impacts of uncertainties, additional sensitivity analyses, and an assessment of the impact of the power uprate on accident progression. Exelon submitted further information on April 8, 2002 (Enclosure 3 to NRC 2002) clarifying remaining issues. In these responses, Exelon provided additional information on the jockey pump SAMA and on the averted risk values determined for SAMA candidates. Exelon's responses addressed the staff's concerns and reaffirmed that none of the SAMAs would be cost-beneficial.

An assessment of SAMAs for Peach Bottom Units 2 and 3 is presented below.

5.2.2 Estimate of Risk for Peach Bottom Units 2 and 3

Exelon's estimates of offsite risk at Peach Bottom Units 2 and 3 are summarized in Section 5.2.2.1. The summary is followed by a review of Exelon's risk estimates in Section 5.2.2.2.

5.2.2.1 Exelon's Risk Estimates

The SAMA analysis is based on two distinct analyses: (1) the Level 1 and 2 probabilistic safety assessment performed by Exelon and documented as Peach Bottom PSA, Revision 1, and (2) the extension of the Level 2 PSA to a Level 3 assessment based on application of the NUREG-1150 (NRC 1990a) consequence analysis results for Peach Bottom Units 2 and 3, as reported in NUREG/CR-4551 (NRC 1990b). The Peach Bottom PSA is an update to the Peach Bottom IPE submittal (PECO 1992) and reflects plant changes since the issuance of NUREG-1150 (NRC 1990a) and NUREG/CR-4551 (NRC 1990b). The scope of the Peach Bottom PSA does not include seismic or fire PSA models. As such, the Peach Bottom PSA does not permit either the numerical assessment of the baseline risk or identification of the quantitative change in risk

that could be attributed to any proposed SAMA due to seismic or fire accident initiators. As described in Section 5.2.2.2, Exelon chose to evaluate the potential effects associated with these initiators through a sensitivity study.

The total core damage frequency (CDF) for internal events is 4.5×10^{-6} per reactor-year. The breakdown of CDF is provided in Table 5-3 . As shown in this table, the current analyses show that loss of offsite power (LOOP) and transient events, including station blackout (SBO) and anticipated transient without scram (ATWS), are the dominant contributors to CDF. The contribution of loss-of-coolant accidents (LOCAs) and other internal event initiators to CDF is less than 8 percent.

Table 5-3. Peach Bottom Units 2 and 3 Core Damage Frequency (Revision 1 of PSA)

Initiating Event	Frequency (per reactor-year)	% Contribution to CDF
Loss of Offsite Power (LOOP)	2.1×10^{-6}	46
Transients	1.2×10^{-6}	28
Station Blackout (SBO)	4.7×10^{-7}	10
Anticipated Transient Without Scram (ATWS)	4.3×10^{-7}	10
Loss-of-Coolant Accident (LOCA)	1.9×10^{-7}	4
Internal floods	6.0×10^{-8}	1
Others	4.8×10^{-8}	1
Total CDF (from internal events)	4.5×10^{-6}	100

The total Peach Bottom Unit 2 Level 1 CDF used in the SAMA submittal is 4.5×10^{-6} per reactor-year. The frequency associated with the plant damage states (PDSs) with significant offsite releases is 2.4×10^{-6} per reactor-year. The difference between the Level 1 CDF and the Level 2 endstate frequency represents those core damage sequences that lead to negligible or no release from the primary containment.

The total CDF for Peach Bottom Unit 3 is 4.2×10^{-6} per reactor-year, which is about 8 percent lower than that of Unit 2. This difference is attributed mostly to LOOP sequences involving the loss of 2 or 3 shared diesel generators. Asymmetry in emergency electric power distribution between the units and the diesel loading capability (one RHR pump per diesel generator) concurrent with the common LOOP initiator result in different diesel failure combinations having different CDF impacts at each unit.

The Peach Bottom PSA is limited to Level 1 and 2 and does not include an assessment of off-site consequences. Exelon extended the Level 2 PSA to a Level 3 assessment based on use of the NUREG/CR-4551 consequence analyses, and then scaled these results to account for increased population in the vicinity of Peach Bottom Units 2 and 3 at end of the license renewal period, as described below.

Each sequence in the Peach Bottom Level 2 PSA was reviewed and binned into one of 10 collapsed accident progression bins (APBs) used in NUREG/CR-4551. NUREG/CR-4551 provides the fractional contribution of the ten collapsed APBs and sufficient information to determine the frequency associated with each of the ten collapsed APBs. Exelon determined the population dose by multiplying the ratio of the CDF in the Peach Bottom PSA to the CDF in the NUREG/CR-4551 study by the product of the fractional contribution of the collapsed APBs and the total risk estimate from NUREG/CR-4551. Specifically, for a given collapsed APB the submittal defines the population dose risk as:

$$PDR_{PBAPS-PSA} = \frac{Frequency_{PBAPS-PSA}}{Frequency_{NUREG/CR-4551}} \bullet f_{APB} \bullet PDR_{NUREG/CR-4551}$$

where

$PDR_{PBAPS-PSA}$ = population dose risk at 50 miles for Peach Bottom (person-rem per reactor-year)

$Frequency_{PBAPS-PSA}$ = frequency of each collapsed APB in Peach Bottom PSA (per reactor-year)

$Frequency_{NUREG/CR-4551}$ = frequency of each collapsed APB in NUREG/CR-4551 (per reactor-year)

f_{APB} = fractional contribution of the collapsed APB to the population dose risk in NUREG/CR-4551

$PDR_{NUREG/CR-4551}$ = population dose risk at 50 miles for NUREG/CR-4551 (person-rem per reactor-year).

The resulting population dose estimates were summed over all bins to arrive at a total population dose.

The NUREG/CR-4551 consequence analyses were based on Version 1.5 of the MACCS computer code and site-specific data available at the time of the study (e.g., meteorology, demographics, and offsite property values). For purposes of the SAMA analysis, the population dose estimates were adjusted to account for the increase in population at the end of the

proposed license extension. The population distribution used as input to the NUREG/CR-4551 MACCS analyses is based on the 1980 sector population data for the Peach Bottom site. Using 1990 and 1980 Census data, a growth ratio was developed and used to extrapolate the population out to 2034 to approximate the population at the end of the license renewal period. The ratio of the population density was calculated as:

$$P_{2034/1980} = \frac{\left(\frac{PD_{50(1990)} - PD_{50(1980)}}{1990 - 1980} \bullet 44 \text{ years} + PD_{50(1990)}\right)}{PD_{50(1990)}} \approx 4$$

where

$P_{2034/1980}$ = ratio of the population density for the area within 50 miles of the plant in 2034 to the population density for the area within 50 miles of the plant in 1980

$PD_{50(1980)}$ = population density for the area within 50 miles of the plant in 1980

$PD_{50(1990)}$ = population density for the area within 50 miles of the plant in 1990

Based on this analysis, Exelon estimates the dose to the population within 80 km (50 mi) of the Peach Bottom site to be 0.147 person-Sv (14.7 person-rem) per reactor-year. The contribution to total population dose from the various containment release modes is shown in Table 5-4. Early containment failure dominates the population dose risk at Peach Bottom Units 2 and 3.

Table 5-4. Breakdown of Population Dose by Containment Release Mode

Containment Release Mode	Population Dose [person-Sv (person-rem) per reactor-year]	
Late containment failure	0.006	0.6
Early containment failure	0.133	13.3
Vessel breach, no containment failure	0.002	0.2
No vessel breach, no containment failure	0.006	0.6
Total	0.147	14.7

5.2.2.2 Review of Exelon's Risk Estimates

Exelon's estimate of offsite risk at the Peach Bottom site is based on Revision 1 of the Peach Bottom PSA and the application of the NUREG-1150 Level 3 PSA results as reported in NUREG/CR-4551 (NRC 1990b) to the results of plant-specific Peach Bottom Level 2 PSA. This review considered the following major elements of the analysis:

- the Level 1 and 2 risk models that form the bases for the 1992 IPE and 1996 IPEEE submittals (PECO 1992, 1996)
- the major modifications to the IPE model that have been incorporated in the Peach Bottom PSA
- the extension of the Level 2 PSA to a Level 3 assessment based on use of the NUREG/CR-4551 consequence analyses and subsequent scaling of these results to account for increased population in the vicinity of the Peach Bottom site at the end of the period of extended operation
- the contribution to risk due to internal and external initiating events, as reflected in the NRC-sponsored PSA for Peach Bottom Units 2 and 3 conducted as part of the NUREG-1150 studies.

Each of these analyses was reviewed to determine the acceptability of Exelon's risk estimates for the SAMA analysis, as summarized below.

The staff's review of the Peach Bottom IPE is described in an NRC safety evaluation dated October 25, 1995 (NRC 1995). The review was based on a comparison between the results reported in the IPE submittal and the results of the staff study documented in NUREG-1150 and NUREG/CR-4551. Based on this review, the staff concluded that Exelon's analysis met the intent of Generic Letter 88-20 (NRC 1988); that is, the IPE was of adequate quality to be used to look for design or operational vulnerabilities. Overall, the staff believed that the Peach Bottom IPE was of adequate quality to be used as a tool in searching for areas with high potential for risk reduction and to assess such risk reductions.

A comparison of risk profiles between the original IPE (which was reviewed by the NRC staff) and the current PSA used in the SAMA analysis indicates a 20 percent reduction in the total Peach Bottom Unit 2 CDF. The PSA was updated twice (in 1997 and again in 1999) since the original IPE was submitted to the NRC to reflect model enhancements and plant changes, such as a 5 percent power uprate approved in 1994. The specific changes since the Peach Bottom IPE include (Exelon 2002):

- improved plant operating experience was reflected in the overall frequency of initiating events

- initiating events that were previously subsumed within other initiators (e.g., loss of instrument air and service water) were modeled as separate initiating events

- more detailed modeling of operator actions directed by procedures during LOOP events was incorporated, including credit for the Conowingo tie-line

- common cause failure terms for high pressure coolant injection (HPCI)/reactor core isolation cooling (RCIC), direct current (dc) battery pairs, and other miscellaneous systems were added

- treatment of common cause failures was reevaluated using the new Idaho National Engineering and Environmental Laboratory (INEEL) database (INEEL 1998)

- implementation of improved technical specifications was reflected in the model.

The incorporation of lower initiating event frequencies, additional LOOP recovery capabilities such as the Conowingo tie-line, and the INEEL common cause database have resulted in a reduction in total internal events CDF from that reported in the IPE. On the other hand, modeling of additional initiating events, detailed operator actions for LOOP, and common cause terms for HPCI/RCIC and dc batteries have resulted in increasing the total internal events CDF. Collectively, the incorporation of all the changes have resulted in a 20 percent reduction in the total CDF, as compared with the original IPE CDF estimate of about $5.5x10^{-6}$ per reactor-year. This is a relatively small change. The revised CDF estimate for Peach Bottom Units 2 and 3 is still comparable to values estimated for other BWR/3 and BWR/4 model plants, which Figure 11.2 of NUREG-1560 (NRC 1997a) shows to range from $9X10^{-6}$ to $8X10^{-5}$ per reactor-year, with a point estimate value of $2X10^{-5}$ per reactor-year.

The staff noted that the Peach Bottom PSA has been subjected to peer review at various stages, by internal and external reviewers, including a 1998 review of Revision 1 using the BWR Owners Group (BWROG) PSA Peer Review Certification Implementation Guidelines (Exelon 2002).

Exelon submitted an IPEEE by letter dated May 29, 1996 (PECO 1996), in response to Supplement 4 of Generic Letter 88-20 (NRC 1991). Exelon did not identify fundamental weaknesses or vulnerabilities to severe accident risk in regard to the external events related to seismic, fire, or other external events. However, a number of areas were identified for improvement in both the seismic and fire areas. In a letter dated November 22, 1999, the staff concluded that the submittal met the intent of Supplement 4 to Generic Letter 88-20 (NRC 1999b).

In a response to an RAI, Exelon acknowledged (Exelon 2002) that the risk assessment methods used for the Peach Bottom IPEEE do not provide the means to determine the numerical estimates of the CDF contributions from seismic and fire initiators. However, the licensee states that the current risk associated with external events at Peach Bottom Units 2 and 3 is much lower than that which existed at the time of the publication of NUREG/CR-4551 because of many plant improvements that have been made since that time, mostly as a result of the insights gained from the Peach Bottom IPEEE. These improvements include:

- Increased fire brigade awareness of important fire areas
- Incorporated automatic sprinklers in 4 kV switchgear areas
- Incorporated sprinklers in the 13 kV area and added sprinkler heads on the 116 ft elevation between the 13 kV area and the remainder of the turbine building (i.e., creating a water curtain at the openings)
- Replaced or upgraded Thermo-lag fire barriers in several fire areas
- Replaced or upgraded miscellaneous equipment for resolution of Generic Safety Issue A-46, “Seismic Qualification of Equipment in Operating Plants.”

In addition, Exelon notes that the quantitative contributions from external events, as estimated in NUREG/CR-4551 for Peach Bottom Units 2 and 3, would be bounded by the 95th percentile CDF estimate for internal events (see Table 5-6). An associated sensitivity study by Exelon shows that use of the 95th percentile CDF in the cost-benefit evaluation in lieu of the point estimate value impacts the screening for only two SAMAs. However, a further evaluation of these two SAMAs indicates that they would not be cost-beneficial (Exelon 2002). This is discussed further in Section 5.2.6.2.

The failure to consider the quantitative impact of external events by the licensee is acceptable given: (1) the IPEEE process has led to the identification and disposition of potential external events vulnerabilities; and (2) the insights from the consideration of the 95th percentile of the risk of core damage, which bound the potential impact if the quantitative risk of external events were included.

The process used by Exelon to extend the Peach Bottom PSA to an assessment of offsite consequences was reviewed. That process involved binning the sequences in the Peach Bottom Level 2 PSA into one of 10 collapsed APBs used in NUREG/CR-4551 and determining the population dose based on the APB frequency and the consequences of the APBs reported in NUREG/CR-4551. The relative distribution of the site-specific economic data utilized in NUREG/CR-4551 was assumed to remain constant. However, the overall growth in economy and agriculture were assumed to be reflected by the growth in the population. This increase was

accounted for by scaling the population dose estimates by a factor of 4. Evacuation modeling remained unchanged from what was utilized in NUREG/CR-4551. The staff concludes that the process used by Exelon to extend the Level 2 PSA results to a Level 3 assessment, and to scale the results to account for subsequent population growth is technically sound and properly implemented, and therefore is acceptable. Furthermore, the staff concludes that the evacuation assumptions and analysis are reasonable and acceptable for the purposes of the SAMA evaluation.

The Exelon assessment has focused on the risk based on the uprate power of 3458 MW(t). In response to an RAI, Exelon qualitatively assessed the influence of the 5 percent power uprate on the containment response and radiological releases to be negligible (Exelon 2002). The staff concludes that the basis for the licensee's qualitative assessment of the 5 percent power uprate is reasonable, and that the methodology used by Exelon to estimate the CDF and offsite consequences for Peach Bottom Units 2 and 3 provides an acceptable basis from which to proceed with an assessment of risk reduction potential for candidate SAMAs. Accordingly, the staff based its assessment of risk on the CDF and population doses reported by Exelon.

5.2.3 Potential Plant Improvements

The process for identifying potential plant improvements, an evaluation of that process, and the improvements evaluated in detail by Exelon are discussed in this section.

5.2.3.1 Process for Identifying Potential Plant Improvements

Exelon's process for identifying potential plant improvements (SAMAs) consisted of the following elements:

- review of SAMA analyses submitted in support of original licensing and license renewal activities for other operating nuclear power plants and advanced light-water reactor plants
- review of other NRC and industry documentation
- review of plant-specific risk management insights developed as part of the accident management implementation process at Peach Bottom Units 2 and 3

Those accident management strategies that were identified in the IPE as beneficial in reducing risk in a measurable manner and applicable to Peach Bottom Units 2 and 3 have already been implemented by Exelon. These include an enhanced version of the procedure for loss of offsite

power events (SE-11), and the Torus Hard Piped Vent. The review of the updated PSA in 1997 and 1999 did not reveal any significant changes in the risk profile originally assessed as part of the IPE process (Exelon 2002).

Based on this process, an initial list of 204 candidate improvements was identified, as reported in Table G.4-16 of Appendix G to the ER. Exelon performed a qualitative, Phase I screening of the initial list of SAMAs using the following criteria:

- The SAMA is not applicable to Peach Bottom Units 2 and 3 due to design differences (e.g., not applicable to the BWR/4 Mark I design).

- The SAMA is related to an interfacing system loss-of-coolant accident (ISLOCA). These types of events are not considered to be significant risk contributors for BWRs, as described in NRC Information Notice 92-36 (NRC 1992) and its supplement (NRC 1994b).

- The SAMA is related to the mitigation of recirculation pump seal failures. NUREG-1560 indicates that although reactor coolant pump (RCP) seal leakage is important to pressurized water reactors (PWRs), it does not significantly contribute to CDF in BWRs [NRC 1997a].

- The SAMA has already been implemented at Peach Bottom Units 2 and 3.

- The SAMA is related to design changes that would be implemented prior to construction (primarily those taken from the severe accident mitigation design alternative analysis for the Advanced Boiling Water Reactor).

- The SAMA was known to have an implementation cost that far exceeds any possible risk benefit.

Any SAMA candidates that were sufficiently similar to other SAMA candidates were either combined or screened from further consideration. Based on the Phase I screening, 174 SAMAs were eliminated, leaving 30 SAMAs which were considered applicable to Peach Bottom Units 2 and 3 and of potential value in reducing the risk of severe accidents.

These 30 candidate SAMAs were further evaluated and screened as part of a Phase II evaluation. Exelon quantitatively evaluated the risk-reduction potential and the implementation costs for each of the 30 SAMA candidates, as described in Sections 5.2.4 and 5.2.5, respectively. If the implementation costs were greater than the maximum benefit, then the SAMA was screened from further consideration. Using this approach, all but 12 SAMAs were eliminated because the cost was expected to exceed the maximum benefit. Of the 12 remaining candidates, 7 were screened from further analysis based on plant-specific risk insights regarding the systems that would be affected by the proposed SAMA (i.e., a more realistic evaluation of the benefit that would be obtained). These are:

- SAMA 2 - Improved ability to cool the residual heat removal (RHR) heat exchangers. This was screened out on the basis that a procedure is already in-place to cross-tie to the opposite unit High Pressure Service Water (HPSW) pumps, a cross-tie to the Fire Protection System (FPS) would not provide sufficient flow for cooling, and the cost of new hardware addition would be more than $2 million.

- SAMA 6 - Use the fire protection system as a backup source for the containment spray system. This was originally screened out on the basis that adding a backup source would not contribute to risk reduction because the Emergency Operating Procedures (EOPs), based on EPG Revision 4 guidance, would preclude using the sprays. In a response to an RAI (Exelon 2002), Exelon did clarify that new in-place procedures, based on Revision 1 of the Emergency Procedure and Severe Accident Guidelines (EP/SAG), would allow for the drywell sprays to be used to cool debris and thereby reduce probability for shell melt-through. Thus a backup source could possibly contribute to risk reduction. However, Exelon points our that the maximum benefit resulting from using the fire protection system is $284,000. This is contrasted with the cost of $0.5M/unit or $1.0M/site, which would include hardware changes to enhance the flow rate and to supply supplemental power to the RHR injection valves.

- SAMA 15 - Proceduralize intermittent operation of HPCI. This was screened out based on Exelon's judgement that intermittent operation of HPCI during SBO events would be detrimental to battery life and would not be desirable.

- SAMA 17 - Enhance procedure to instruct operators to trip unneeded RHR/containment spray (CS) pumps on loss of room ventilation. This was screened out on the basis that the risk reduction worth associated with CS, LPCI, and Normal Service Water (NSW) is minimal and therefore only a small change in the CDF would be expected due to improvements in room cooling dependency.

- SAMA 19 - Modify Reactor Water Cleanup (RWCU) for use as decay heat removal system and proceduralize use. This was screened out on the basis that the Peach Bottom RWCU system is incapable of serving as the sole decay heat removal system until many days after reactor shutdown.

- SAMA 27 - Improve Uninterruptible Power Supplies (UPS). This was screened out on the basis that the UPSs are not considered by Exelon to be risk significant, although they would increase the reliability of power supplies supporting front-line safety equipment. Because they are considered risk insignificant, the UPSs are not even modeled in the Peach Bottom PRA. Thus, no quantitative measure of averted risk, however small, could be made by Exelon.

- SAMA 30 - DC Cross-ties. This was screened out on the basis that a procedure (SE-11) has already been developed to optimize cross-tie capabilities of the 4 kV buses and various power supplies afforded by the emergency diesel generators and the dedicated power source from Conowingo Dam. Because the benefit is already obtained from the SE-11 procedure, the addition of the DC cross-ties would not be cost effective.

The five remaining SAMA candidates are listed in Table 5-5. For each of the five remaining SAMA candidates, a more detailed conceptual design was prepared along with a more detailed estimated cost, as described in Section 5.2.5.

5.2.3.2 Staff Evaluation

Exelon's efforts to identify potential SAMAs focused primarily on areas associated with internal initiating events. The initial list of SAMAs generally addressed the accident categories that are dominant CDF contributors or issues that tend to have a large impact on a number of accident sequences at Peach Bottom Units 2 and 3. The preliminary review of Exelon's SAMA identification process raised some concerns that plant-specific risk contributors were not fully considered. The staff requested additional plant-specific risk information (e.g. importance measures) to determine if any significant SAMAs might have been overlooked. Exelon's response to the RAI indicated that all important plant-specific candidate SAMAs had been considered (Exelon 2002). However, importance measures were only used on a selected basis. Exelon did not provide information indicating that they had performed a systematic and comprehensive evaluation of importance measures and their relation to potential SAMAs. Exelon indicated that, because there are only small differences between the IPE PRA and the current (Revision 1) PSA, the original and subsequent evaluations of plant-specific accident mitigation strategies is sufficient for SAMA candidate determination. While the staff's position is that a comprehensive assessment of importance measures and/or cut sets is important to determining SAMA candidates, it does recognize that Exelon used the plant-specific risk study to identify candidate SAMAs and therefore concludes that the list of SAMA candidates appears to address the major contributors to risk for both the IPE and the PSA.

The list of 204 candidate SAMAs focuses on hardware changes that tend to be expensive to implement. However, about one-third of the 204 candidate SAMAs involve something other than hardware changes. These options could provide marginally smaller risk reductions with much smaller implementation costs.

Of the 204 SAMA candidates, Exelon eliminated 26 because they were associated with reactor coolant pump seal failures or ISLOCA (both considered to be too insignificant with respect to BWR risk to pursue), 31 were eliminated because they were determined to not be applicable to Peach Bottom Units 2 and 3 (for various reasons), 39 were combined with other similar candidate SAMAs, 61 were already implemented at Peach Bottom Units 2 and 3, 10 were determined to not be cost beneficial (cost of implementation would exceed risk benefit), and 7 were judged to

provide no safety benefit. This left 30 SAMA candidates for further consideration. Of the 30 remaining SAMAs that were applicable to Peach Bottom Units 2 and 3 and were of potential value in averting the risk of severe accidents, 7 were not hardware changes.

As described in Section 5.2.3.1, Exelon eliminated 18 of the remaining 30 SAMA candidates as part of the Phase II screening by comparing the estimated costs of the candidates to the maximum benefit ($2.04M/site, see Section 5.2.6 for further discussion) attained by eliminating all risk, and finding that costs for each of the eighteen were much greater than the maximum benefit. Because the actual benefit for any of the eighteen would be considerably less than this maximum, the staff concludes that these eighteen were properly eliminated.

The next step in the process was to reduce the remaining 12 SAMA candidates further. Seven were eliminated by Exelon by considering cost, enhancements and qualitative arguments for disposition. The staff considered each and concluded that the Exelon position was acceptable except for the matter of the fire protection system as a containment spray source backup (SAMA 6). In response to RAIs, Exelon addressed this matter further and also addressed a SAMA candidate not considered in its original SAMA list. These two potential SAMAs are discussed below.

The staff questioned Exelon's basis for screening out SAMA 6 (use the fire protection system [FPS] as a backup source for the containment spray system) given that the plant-specific emergency operating procedures had been modified since the original screening, potentially impacting the value of this SAMA. In response to an RAI, Exelon indicated that the SAMAs were dispositioned when procedures based on Revision 4 of the Emergency Procedure Guidelines (EPG) were in place at Peach Bottom Units 2 and 3. These guidelines severely restricted the ability to use drywell sprays, making this hardware modification ineffective. Since that time, the procedures have been revised based on Revision 1 of the Emergency Procedure and Severe Accident Guidelines (EP/SAG), which provide less restrictive guidance concerning the use of drywell sprays for accident mitigation. Revision 2 of the EP/SAG, which was issued by the Boiling Water Reactor Owners Group in 2001 but is not yet implemented at Peach Bottom Units 2 and 3, provides additional flexibility in the use of sprays.

In response to the staff's request, Exelon provided additional information regarding the benefits and costs of this SAMA. Exelon noted that the diesel fire pump could be used to supply the drywell sprays in those accident sequences for which AC power or DC power may not be available to operate RHR or HPSW. The Fussell-Vesely importance for these sequences leading to core damage is approximately 0.1. Thus, only about 10 percent of the core damage scenarios leading to possible radionuclide releases could be influenced by the use of FPS for drywell sprays. Exelon noted that FPS as a backup source for the containment spray system would require a modification to enhance the system flow rate and add supplemental power to the RHR injection values, and estimated the cost of these modifications at $0.5M/unit. The maximum

benefit was estimated to be $284K based on a conservative assumption that all SBO events would be successfully mitigated using the fire protection system. On the basis of this information, Exelon concluded that this SAMA will not provide sufficient risk reduction to warrant its expense. The staff considers Exelon's dispositioning of this SAMA based on the above costs and benefits to be reasonable.

The staff's risk study of Peach Bottom Units 2 and 3 (NRC 1990b) concluded that a potentially beneficial procedural modification might be one to reduce the probability of a common-mode DC power failure. Exelon addressed this possible additional candidate in their responses to RAIs (Exelon 2002). They state that the DC system and associated common cause events have a low impact on the baseline CDF and risk (e.g., the Fussell-Vesely importance is 4.3×10^{-5}) and that therefore, justification for a modification is not supported as being cost beneficial. The staff concludes that the Exelon evaluation is reasonable.

The remaining 5 SAMA candidates are addressed quantitatively in Sections 5.2.4 and 5.2.5.

The NRC notes that the set of SAMAs submitted is not all inclusive, because additional, possibly even less expensive, design alternatives can always be postulated. However, the staff concludes that the benefits of any additional modifications are unlikely to exceed the benefits of the modifications evaluated and that the alternative improvements would not likely cost less than the least expensive alternatives evaluated, when the subsidiary costs associated with maintenance, procedures, and training are considered. On this basis, the NRC concludes that the set of potential SAMA alternatives identified by Exelon is acceptable.

5.2.4 Risk Reduction Potential of Plant Improvements

Exelon developed a quantitative estimate of the risk reduction for each of the 5 SAMAs remaining after the Phase II screening. The specific impacts on the CDF and the population dose were identified, the appropriate model elements were changed to reflect the plant or procedure enhancement, and the models were requantified. Table 5-5 lists the assumptions used to estimate the risk reduction, the estimated risk reduction in terms of percent reduction in CDF and population dose, and the estimated total benefit (present value) of the averted risk for each of the 5 SAMAs.

In response to an RAI, Exelon estimated the uncertainties associated with the calculated CDF, and reassessed the Phase II screening based on use of the 95th percentile value of the CDF in the cost-benefit analysis instead of the point estimate value. Exelon found that two of the SAMAs would no longer be screened out; however, a more detailed examination by Exelon concluded

that these two SAMAs would not be justified on a cost-benefit basis (Exelon 2002). In addition, Exelon states that even if the impact of external events on the CDF, as estimated in NUREG/CR-4551 in the late 1980s, were to be included in the evaluation, the increase would be less than that provided by the 95th percentile CDF estimate from internal events (Exelon 2002). These assessments are discussed further in Section 5.2.6.2.

Of the five candidates described in Table 5-5, the one that has costs and benefits that are of the same order is SAMA 21, suppression pool jockey pump. This pump would provide an independent means of providing long term injection into the reactor pressure vessel following venting or containment failure. In the PSA, the jockey pump was initially simulated by changing the failure probability for the fire pump from 0.8 to 0.01 (the PSA includes a simple representation of the fire pump to perform a similar function). This is considered optimistic by Exelon. The resulting risk reduction translated into a benefit value of $351,000. Because this risk-reduction value was large, the staff asked Exelon for additional information regarding the costs and the risk-reduction potential of this SAMA. Exelon claimed that a more realistic benefit value for SAMA 21 is about $152,000 (Enclosure 3 to NRC 2002). The PSA evaluation for the more realistic case assumed that the jockey pump is supplied by the E2 480V bus, i.e., the bus with the lowest risk achievement worth in the model, with a total system reliability of 0.05 (including human error) instead of the optimistic value of 0.01. The staff concurs that the reliability value of 0.05 is a reasonable best-estimate, and that the more realistic risk reduction estimates provided by Exelon are appropriate values to use in the SAMA assessment.

The NRC staff has reviewed Exelon's bases for calculating the risk reduction for the various plant improvements and concludes that the methodology is sound and that the values calculated are reasonable for SAMA purposes.

5.2.5 Cost Impacts of Candidate Plant Improvements

As part of the Phase II screening, Exelon developed a preliminary cost estimate for each of the 30 unique SAMA candidates remaining after the qualitative (Phase I) screening. These preliminary cost estimates, reported in Table G.4-2 of the ER, were developed to determine which SAMA candidates would clearly cost more than $2.04M (the maximum benefit associated with completely eliminating all risk, as described in Section 5.2.6.1) and could readily be dismissed. The cost estimates were based on the total costs associated with engineering, procurement, and construction. All costs for all SAMAs were provided on a per site basis. Where applicable, costs were determined on dual-unit basis (rather than doubling a single-unit estimate) to give a more accurate overall cost estimate.

Table 5-5. SAMA Cost/Benefit Screening Analysis

Phase II SAMA #	SAMA	Assumptions	% Risk Reduction		Total Benefit	Cost (2001 dollars)	Net Value ($)	
			CDF	Population Dose			Base Case	3% Discount Rate
1	Enhance procedural guidance for use of cross-tied component cooling or service water pumps	Eliminate initiating events related to loss of service water, by setting basic events involving failure of service water, turbine building closed cooling water, and reactor building closed cooling water pumps to zero	0.7	0.07	$8400	$50,000	(41,600)	(39,000)
11	Provide additional DC battery capacity	Extend battery life 4 hours to simulate additional battery capability. Impacts the loss of offsite power cases with HPCI and/or RCIC available.	19	13	$265,000	$1,600,000	(1,330,000)	(1,250,000)
13	Develop procedures to repair or replace failed 4-kV breakers	Improved procedures to repair or replace failed 4 kV breakers would reduce 4 kV breaker “fail to close” rates to zero, and reduce 4kV bus failure rates by a factor of 10.	0.1	very small	$400	$50,000	(49,600)	(49,500)
18	Increase the safety relief valve reseat reliability (case A)	Safety relief valve (SRV) “failure to reseat” probabilities reduced by a factor of 10.	4	5	$94,000	$2,000,000	(1,910,000)	(1,890,000)
18	Increase the safety relief valve reseat reliability (case B)	SRV “failure to reseat” probabilities reduced by a factor of 10, and stuck-open safety relief valve initiating event frequency reduced by a factor of 10.	6	10	$174,000	$2,000,000	(1,830,000)	(1,770,000)
21	Install suppression pool jockey pump for alternate injection to the reactor pressure vessel (optimistic)	Installation of a suppression pool jockey pump simulated by reducing the failure probability for the fire pump to 0.01	8	27	$351,000	$480,000	(129,000)	(19,400)
21	Install suppression pool jockey pump for alternate injection to the reactor pressure vessel (realistic)	Installation of a suppression pool jockey pump simulated by reducing the failure probability for the fire pump to 0.05	5	9	$152,000	480,000	(328,000)	(280,000)

Using the $2.04M screening value, 18 candidate SAMAs were eliminated. Of the 12 remaining candidates, 7 were screened from further analysis based on plant-specific risk insights regarding the systems that would be affected by the proposed SAMA, as described in Section 5.2.3.1 and 5.2.3.2. For the five remaining SAMA candidates, a more detailed conceptual design was prepared along with a more detailed cost estimate based on the same set of cost elements considered. Table 5-5 shows the cost estimates for the five remaining SAMAs.

The staff compared the cost estimates in Table G.4-2 of the ER to estimates developed elsewhere for similar improvements, including estimates developed as part of other licensees' analyses of SAMAs for operating reactors and advanced light-water reactors. The Exelon estimates were found to be consistent and reasonable for the SAMAs under consideration. For SAMAs 1 and 13, the estimate of $50,000 for a site procedural change is consistent with other cost assessments for similar actions. The range determined from other SAMA studies is $30,000 to $70,000.

For SAMA 18, the cost estimate of $2M is based on $200K/safety relief valve (SRV) times 10 automatic depressurization system SRVs (5 per unit). Because this SAMA assumes replacing the SRVs with new models, the cost is reasonable.

For SAMA 11, the cost estimate of $1.6M is based on $200K/battery times 8 batteries. This cost includes engineering analysis, equipment (new battery capability), and modification implementation. The cost is reasonable for a "hardware" SAMA of this size.

For SAMA 21, Exelon provided an estimated implementation cost of $480K (for both units) based on a previous cost estimate for the Advanced Boiling Water Reactor (ABWR). The ABWR cost estimate was doubled to account for the higher cost of installing the modification in an operating plant, versus during new plant construction. In response to a staff request, Exelon noted that this cost estimate was optimistic and that, in reality, when considering the costs associated with the installation of a totally independent system (new pump, power supply cables, and new piping) capable of injecting saturated water from the suppression pool, the costs would be much higher (Enclosure 3 to NRC 2002). Based on these comments from Exelon and further consideration of the modification, the staff considers the cost estimate of $480,000 not unreasonable but certainly optimistic. The lower-bound nature of this estimate should be taken into account in the cost-benefit comparison.

The staff concludes that the cost estimates are sufficient and appropriate for use in the SAMA evaluations.

5.2.6 Cost-Benefit Comparison

The staff's evaluation of Exelon's cost-benefit analysis is described in the following sections.

5.2.6.1 Exelon Evaluation

The methodology used by Exelon was based primarily on NRC's guidance for performing cost-benefit analysis, i.e., NUREG/BR-0184, *Regulatory Analysis Technical Evaluation Handbook* (NRC 1997b). The guidance involves determining the net value for each SAMA according to the following formula:

Net Value = ($APE + $AOC + $AOE + $AOSC) – COE

where

$APE = present value of averted public exposure ($)

$AOC = present value of averted offsite property damage costs ($)

$AOE = present value of averted occupational exposure costs ($)

$AOSC = present value of averted onsite costs ($)

COE = cost of enhancement ($)

If the net value of a SAMA is negative, the cost of implementing the SAMA is larger than the benefit associated with the SAMA and it is not considered cost-beneficial. Exelon's derivation of each of the associated costs is summarized below.

Averted Public Exposure (APE) Costs

The APE costs were calculated using the following formula:

APE = Annual reduction in public exposure (△person-rem/reactor-year)
x monetary equivalent of unit dose ($2000 per person-rem)
x present value conversion factor (10.76 based on a 20-year period with a 7-percent discount rate).

As stated in NUREG/BR-0184 (NRC 1997b), it is important to note that the monetary value of the public health risk after discounting does not represent the expected reduction in public health risk due to a single accident. Rather, it is the present value of a stream of potential losses extending over the remaining lifetime (in this case, the renewal period) of the facility. Thus, it reflects the expected annual loss due to a single accident, the possibility that such an accident could occur at any time over the renewal period, and the effect of discounting these potential future losses to present value. For the purposes of initial screening, Exelon calculated an APE of approximately $317,000.

Averted Offsite Property Damage Costs (AOC)

The AOCs were calculated using the following formula:

AOC = Annual CDF reduction
x offsite economic costs associated with a severe accident (on a per-event basis)
x present value conversion factor.

For the purposes of initial screening (severe accident costs eliminated), Exelon cited an annual offsite economic risk of $51,700 based on the Level 3 risk analysis. This results in a discounted value of approximately $557,000.

Averted Occupational Exposure (AOE) Costs

The AOE costs were calculated using the following formula:

AOE = Annual CDF reduction
x occupational exposure per core damage event
x monetary equivalent of unit dose
x present value conversion factor.

Exelon derived the values for averted occupational exposure from information provided in Section 5.7.3 of the regulatory analysis handbook (NRC 1997b). Best-estimate values provided for immediate occupational dose (3300 person-rem) and long-term occupational dose (20,000 person-rem over a 10-year cleanup period) were used. The present value of these doses was calculated using the equations provided in the handbook in conjunction with a monetary equivalent of unit dose of $2000 per person-rem, a real discount rate of 7 percent, and a time period of 20 years to represent the license renewal period. For the purposes of initial screening (severe accident costs eliminated), Exelon calculated an AOE of approximately $1,700.

Averted Onsite Costs (AOSC)

Averted onsite costs include averted cleanup and decontamination costs and averted power replacement costs. Repair and refurbishment costs are considered for recoverable accidents only and not for severe accidents. Exelon derived the values for AOSC based on information provided in Section 5.7.6 of the regulatory analysis handbook (NRC 1997b).

Exelon divided this cost element into two parts, the Onsite Cleanup and Decontamination Cost, also commonly referred to as averted cleanup and decontamination costs (ACC), and the Replacement Power Cost (RPC).

Averted cleanup and decontamination costs (ACC) are calculated using the following formula:

ACC = Annual CDF reduction
x present value of cleanup costs per core damage event
x present value conversion factor.

The total cost of cleanup and decontamination subsequent to a severe accident is estimated in the regulatory analysis handbook to be $\$1.1 \times 10^9$ (undiscounted). This value was converted to present costs over a 10-year cleanup period and integrated over the term of the proposed license extension. For the purposes of initial screening (severe accident costs eliminated), Exelon calculated an ACC of approximately $53,600.

Long-term RPC are calculated using the following formula:

RPC = Annual CDF reduction
x present value of replacement power for a single event
x factor to account for remaining service years for which replacement power is required
x reactor power scaling factor

For the purposes of initial screening (severe accident costs eliminated), Exelon calculated an RPC of approximately $91,000.

Exelon evaluated all costs and benefits on a per site rather than per unit basis. Accordingly, they applied a factor of two multiplier to each of the above cost elements to account for the contribution from both units. Using the above equations and applying this multiplier, Exelon estimated the total present dollar value equivalent associated with completely eliminating severe accidents at Peach Bottom Units 2 and 3 to be $2.04M for the site.

Exelon's Results

The cost-benefit results for the individual analysis of the final five SAMA candidates are presented in Table 5-5. All of the SAMAs have negative net values. Exelon concluded that implementation of any of these SAMAs is not justified because the costs of implementation exceed the benefits. Therefore, Exelon has decided not to pursue any of these SAMAs further.

5.2.6.2 Staff Evaluation

The cost-benefit analysis conducted by Exelon was based primarily on the NRC's Regulatory Analysis Technical Evaluation Handbook (NRC 1997b). Averted risks were for the Peach Bottom Units 2 and 3, and thus were twice the values for a single unit. To maintain expenditures on the same scale, Exelon either doubled the single-unit SAMA costs or assessed SAMA costs on a (shared) plant station basis. While this is not a typical practice, it is reasonable.

Exelon originally did not perform sensitivity studies as recommended in the regulatory analysis handbook (NRC 1997b). In response to an RAI, Exelon performed a sensitivity study in which

the discount rate was reduced from 7 percent in the baseline analysis to 3 percent. This results in an increase in the maximum benefit (for completely eliminating all risk) from $2.04M to about $2.7M. As a result, five of the SAMAs previously eliminated in the Phase II screening (on the basis that their implementation costs were greater than the maximum benefit) were reassessed because their implementation costs would be less than the revised maximum benefit of $2.7M. These SAMAs were:

- SAMA 3 - Install an independent method of suppression pool cooling
- SAMA 5 - Install a containment vent large enough to remove ATWS decay heat
- SAMA 23 - Install a Safety-Related Condensate Storage Tank
- SAMA 24 - Install improved vacuum breakers (redundant valves in each line)
- SAMA 28 - Dedicated RHR (bunkered) Power Supply

Upon further evaluation, either the risk reduction associated with these additional SAMAs was estimated to be relatively small, or the realistic implementation costs were judged to be greater than the benefits. On this basis, Exelon determined that these SAMAs would not be cost beneficial.

Similarly, implementing any of the SAMAs in the near term instead of waiting until the start of the license renewal period (thereby extending the period in the value-impact analysis) would not increase the net benefit sufficiently to make any of the SAMA candidates cost-beneficial.

Use of a 3 percent discount rate also increases the benefits associated with the 5 candidate SAMAs that had already survived the Phase II screening. The net benefits of these SAMAs using a 3 percent discount rate is shown in the last column of Table 5-5. The net benefits for each of the SAMAs remain negative, although SAMA 21 - Install suppression pool jockey pump, is only marginally negative (-$19K), based on an averted risk value of $461K and an estimated cost of $480K.

In their responses to the staff's RAIs (Exelon 2002), Exelon addressed the impact of considering the 95th percentile CDF, a value 7 times larger than the point estimate (see Table 5-6). The resultant increase in the averted risks would tend to make the SAMAs more attractive.

Table 5-6. Uncertainty in the Calculated CDF for Peach Bottom Unit 2

Percentile	CDF (per reactor-year)
5th	1.6×10^{-6}
25th	2.6×10^{-6}
50th	4.2×10^{-6}
75th	7.8×10^{-6}
95th	3.0×10^{-5}

Exelon reassessed all 30 of the candidate SAMAs and found that two SAMAs became cost-beneficial under the 95th percentile assumption. These were SAMA 11 - Provide additional DC battery capability, and SAMA 21 - Install suppression pool jockey pump. The benefits for SAMA 11 are still relatively close to the costs (i.e., a net value of $145K) when the 95th percentile CDF is used. Since the 95th percentile is an upper bound, and the net value is still relatively small, the staff agrees with Exelon that SAMA 11 is not a candidate for further consideration.

The benefits of SAMA 21 are substantially greater than the costs (i.e., a net value of $1.85M) when the 95th percentile CDF and optimistic risk reduction assumptions (see Section 5.2.4) are used, suggesting that the SAMA might also be cost-beneficial given more modest increases in the estimated CDF than a factor of seven. Also, as mentioned above, the net value of SAMA 21 is only marginally negative using a 3 percent discount rate (and point estimate CDF values). However, when averted onsite costs (AOSC) are excluded from the cost benefit, the net value becomes more negative. (The Regulatory Analysis Guidelines direct the staff to display the results with this attribute excluded if such exclusion would change the apparent conclusion to be drawn from the calculated net benefit.) Furthermore, based on a more realistic estimate of the risk reduction for this SAMA provided in Section 5.2.4, the benefits are substantially less and this SAMA would have a negative net value of approximately $300K. The impact of these major assumptions and uncertainties on the cost-benefit results are summarized in Table 5-7.

Table 5-7 Impact of Uncertainties on SAMA #21 Costs and Benefits

	Analysis Case				
Cost-Benefit Element	**Base Case**	**95th Percentile CDF**	**3% Discount Rate**	**AOSC excluded**	**"Realistic" Averted-Risk Benefit**
Benefit	$351K	$2,330K	$461K	$339K	$152K
Cost	$480K	$480K	$480K	$480K	$480K
Net Value	–$129K	+$1,850K	–$19K	–$141K	–$328K

Exelon stated that the estimated cost to implement SAMA 21 is conservative (see discussion in Section 5.2.5). The staff acknowledges that the implementation cost may be conservative, and further notes that when AOSC is excluded, the net value of the SAMA is clearly negative.

Although this SAMA may have a positive net value under certain conditions, it does not appear to be justified on a cost-benefit basis, given a broader consideration of the conservatisms, uncertainties, and assumptions inherent in the analysis.

5.2.7 Conclusions

Exelon compiled a list of 204 SAMA candidates using as resources: SAMA analyses submitted in support of licensing activities for other nuclear power plants, NRC and industry documents, and documents related to advanced power reactor designs (ABWR). A qualitative screening removed those SAMA candidates that: (1) did not apply to Peach Bottom Units 2 and 3 due to design differences, (2) were related to the mitigation of recirculation pump seal failures or ISLOCA (not significant risk contributors for BWRs), (3) had already been implemented at Peach Bottom Units 2 and 3, or (4) were related to design changes prior to construction. Using the updated Peach Bottom PSA, a maximum obtainable benefit of about $2.04M was calculated. This value was used in a second screening that eliminated the SAMA candidates whose cost to implement would exceed the maximum obtainable benefit. This process left only 12 SAMA candidates for further analysis. SAMAs related to non-risk significant systems were then screened out because any change in the reliability of these systems was found to have a negligible impact on the PSA evaluation. For the remaining 5 SAMA candidates, a more detailed conceptual design and cost estimate were developed as shown in Table 5-5.

The cost-benefit analyses showed that none of the final five SAMA candidates were cost-beneficial. Exelon concluded that there was no justification to implement any of the SAMA candidates and decided not to pursue any of the SAMA candidates further.

The staff reviewed the Exelon analysis and concluded that the methods used and the implementation of those methods were sound. The treatment of SAMA benefits and costs, the generally large negative net benefits, and the inherently small baseline risks support the general conclusion that the SAMA evaluations performed by Exelon are reasonable and sufficient for the license renewal submittal. The unavailability of a seismic and fire PSA model precluded a quantitative evaluation of SAMAs specifically aimed at reducing risk of these initiators; however, significant improvements have been realized as a result of the IPEEE process at Peach Bottom Units 2 and 3 that would minimize the likelihood of identifying cost-beneficial enhancements in this area.

Based on its review of Exelon's SAMA analyses, the staff concludes that none of the candidate SAMAs are cost-beneficial. This conclusion is consistent with the low residual level of risk indicated in the Peach Bottom PSA and the fact that Peach Bottom Units 2 and 3 has already implemented many plant improvements identified by the IPE and IPEEE.

5.3 References

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

10 CFR Part 100. Code of Federal Regulations, Title 10, *Energy*, Part 100, "Reactor Site Criteria."

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Exelon Generation Company (Exelon). 2002. Letter from Michael P. Gallagher, Exelon to U.S. Nuclear Regulatory Commission. Subject: Response to Request for Additional Information Related to Severe Accident Mitigation Alternatives. January 30, 2002.

Idaho National Engineering and Environmental Laboratory (INEEL). 1998. NUREG/CR-5485, "Guidelines on Modeling Common Cause Failures in Probabilistic Risk Assessments," INEEL, University of Maryland, November 1998.

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Philadelphia Electric Company (PECO). 1996. Letter from, PECO to NRC. Subject: Individual Plant Examination of External Events (IPEEE) Submittal, Peach Bottom Atomic Power Station Units 2 and 3, dated May 29, 1996.

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U.S. Nuclear Regulatory Commission (NRC). 1992. Information Notice 92-36: *Intersystem LOCA Outside Containment*, May 7, 1992, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1994a. NUREG-1462, *Final Safety Evaluation Report Related to the Certification of the System 80+ Design.* Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1994b. Information Notice 92-36, Supplement 1: *Intersystem LOCA Outside Containment*, February 22, 1994, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1995. Letter from (NRC) to (Philadelphia Electric Company), Subject: Staff Evaluation of the Peach Bottom Atomic Power Station, Units 2 and 3, Individual Plant Examination (TAC Nos. M74448 and M74449), October 25, 1995, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997a. NUREG-1560, *Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance.* Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997b. NUREG/BR-0184, *Regulatory Analysis Technical Evaluation Handbook*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants Main Report*, "Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Letter from Bartholomew C. Buckley (NRC) to James A. Hutton (PECO Energy Company), Subject: Review of Peach Bottom Atomic Power Station, Units 2 and 3, Individual Plant Examination of External Events Submittal (TAC Nos. M83657 and M83658), November 22, 1999, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2001. Letter from L. L. Wheeler, U.S. NRC to Michael P. Gallagher, Exelon. Subject: Request for Additional Information Related to the Staff's Review of Severe Accident Mitigation Alternatives for Peach Bottom Atomic Power Station Units 2 and 3 (TAC Nos. MB2011 and MB2012), December 20, 2001, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2002. NRC staff Note to File, from L. L. Wheeler, Subject: Public Availability of Information provided to the NRC Staff in Support of the Environmental Review of the Application Submitted by Exelon Generation Company, LLC, for Renewal of the Operating Licenses for Peach Bottom Atomic Power Station, Units 2 and 3, with enclosures, May 30, 2002.

6.0 Environmental Impacts of the Uranium Fuel Cycle and Solid Waste Management

Environmental issues associated with the uranium fuel cycle and solid waste management are discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).[(a)] The GEIS includes a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high-level waste [HLW] and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria for Category 1, and therefore, additional plant-specific review of these issues is required.

This chapter addresses the issues that are related to the uranium fuel cycle and solid waste management during the license renewal term that are listed in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, and are applicable to Peach Bottom Units 2 and 3. The generic potential impacts of the radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes are described in detail in the GEIS based, in part, on the generic impacts provided in 10 CFR 51.51(b), Table S-3, “Table of

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the “GEIS” include the GEIS and its Addendum 1.

Uranium Fuel Cycle Environmental Data," and in 10 CFR 51.52(c), Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor." The staff also addresses the impacts from radon-222 and technetium-99 in the GEIS.

6.1 The Uranium Fuel Cycle

Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are applicable to Peach Bottom Units 2 and 3 from the uranium fuel cycle and solid waste management are listed in Table 6-1.

Table 6-1. Category 1 Issues Applicable to the Uranium Fuel Cycle and Solid Waste Management During the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
URANIUM FUEL CYCLE AND WASTE MANAGEMENT	
Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste)	6.1; 6.2.1; 6.2.2.1; 6.2.2.3; 6.2.3; 6.2.4; 6.6
Offsite radiological impacts (collective effects)	6.1; 6.2.2.1; 6.2.3; 6.2.4; 6.6
Offsite radiological impacts (spent fuel and high level waste)	6.1; 6.2.2.1; 6.2.3; 6.2.4; 6.6
Nonradiological impacts of the uranium fuel cycle	6.1; 6.2.2.6; 6.2.2.7; 6.2.2.8; 6.2.2.9; 6.2.3; 6.2.4; 6.6
Low-level waste storage and disposal	6.1; 6.2.2.2;6.4.2; 6.4.3; 6.4.3.1; 6.4.3.2; 6.4.3.3; 6.4.4; 6.4.4.1; 6.4.4.2; 6.4.4.3; 6.4.4.4; 6.4.4.5; 6.4.4.5.1; 6.4.4.5.2; 6.4.4.5.3; 6.4.4.5.4; 6.4.4.6;6.6
Mixed waste storage and disposal	6.4.5.1; 6.4.5.2; 6.4.5.3; 6.4.5.4; 6.4.5.5; 6.4.5.6; 6.4.5.6.1; 6.4.5.6.2; 6.4.5.6.3; 6.4.5.6.4; 6.6
On-site spent fuel	6.1; 6.4.6; 6.4.6.1; 6.4.6.2; 6.4.6.3; 6.4.6.4; 6.4.6.5; 6.4.6.6; 6.4.6.7; 6.6
Nonradiological waste	6.1; 6.5; 6.5.1; 6.5.2; 6.5.3; 6.6
Transportation	6.1; 6.3.1; 6.3.2.3; 6.3.3; 6.3.4; 6.6, Addendum 1

Exelon Generation Company, LLC (Exelon) stated in its Environmental Report (ER; Exelon 2001) that it is not aware of any new and significant information associated with the renewal of the Peach Bottom Units 2 and 3 operating licenses. The staff has not identified any significant new information during its independent review of the Exelon ER (Exelon 2001), the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in the GEIS. For these issues, the staff concluded in the GEIS that the impacts are SMALL except for the collective offsite radiological impacts from the fuel cycle and from HLW and spent fuel disposal, as discussed below, and that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

A brief description of the staff review and the GEIS conclusions, as codified in Table B-1, 10 CFR Part 51, for each of these issues follows:

- Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste). Based on information in the GEIS, the Commission found that

  > Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part [10 CFR 51.51(b)]. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no offsite radiological impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Offsite radiological impacts (collective effects). Based on information in the GEIS, the Commission found that

  > The 100 year environmental dose commitment to the U.S. population from the fuel cycle, high level waste and spent fuel disposal excepted, is calculated to be about 14,800 person rem [148 person Sv], or 12 cancer fatalities, for each additional 20-year power reactor operating term. Much of this, especially the contribution of radon releases from mines and tailing piles, consists of tiny doses summed over large populations. This same dose calculation can theoretically be extended to include many tiny doses over additional thousands of years as well as doses outside the U.S. The result of such a calculation would be thousands of cancer fatalities from the fuel cycle, but this result assumes that even tiny doses have some statistical adverse health effect which will not ever be mitigated (for example no cancer cure in the next thousand years), and that these doses projected over thousands of years

> are meaningful. However, these assumptions are questionable. In particular, science cannot rule out the possibility that there will be no cancer fatalities from these tiny doses. For perspective, the doses are very small fractions of regulatory limits and even smaller fractions of natural background exposure to the same populations.
>
> Nevertheless, despite all the uncertainty, some judgement as to the regulatory NEPA [National Environmental Policy Act] implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the collective effects of the fuel cycle, this issue is considered Category 1.

The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no offsite radiological impacts (collective effects) from the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Offsite radiological impacts (spent fuel and HLW disposal). Based on information in the GEIS, the Commission found that

> For the high level waste and spent fuel disposal component of the fuel cycle, there are no current regulatory limits for offsite releases of radionuclides for the current candidate repository site. However, if we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, "Technical Bases for Yucca Mountain Standards," and that in accordance with the Commission's Waste Confidence Decision, 10 CFR 51.23, a repository can and likely will be developed at some site which will comply with such limits, peak doses to virtually all individuals will be 100 millirem [1 mSv] per year or less. However, while the Commission has reasonable confidence that these assumptions will prove correct, there is considerable uncertainty since the limits are yet to be developed, no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The NAS report indicated that 100 millirem [1 mSv] per year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 millirem [1 mSv] per year. The lifetime individual risk from 100 millirem [1 mSv] annual dose limit is about 3×10^{-3}.

Estimating cumulative doses to populations over thousands of years is more problematic. The likelihood and consequences of events that could seriously compromise the integrity of a deep geologic repository were evaluated by the Department of Energy in the "Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste," October 1980 [DOE 1980]. The evaluation estimated the 70-year whole-body dose commitment to the maximum individual and to the regional population resulting from several modes of breaching a reference repository in the year of closure, after 1,000 years, after 100,000 years, and after 100,000,000 years. Subsequently, the NRC and other federal agencies have expended considerable effort to develop models for the design and for the licensing of a HLW repository, especially for the candidate repository at Yucca Mountain. More meaningful estimates of doses to population may be possible in the future as more is understood about the performance of the proposed Yucca Mountain repository. Such estimates would involve very great uncertainty, especially with respect to cumulative population doses over thousands of years. The standard proposed by the NAS is a limit on maximum individual dose. The relationship of potential new regulatory requirements, based on the NAS report, and cumulative population impacts has not been determined, although the report articulates the view that protection of individuals will adequately protect the population for a repository at Yucca Mountain. However, EPA's generic repository standards in 40 CFR part 191 generally provide an indication of the order of magnitude of cumulative risk to population that could result from the licensing of a Yucca Mountain repository, assuming the ultimate standards will be within the range of standards now under consideration. The standards in 40 CFR part 191 protect the population by imposing "containment requirements" that limit the cumulative amount of radioactive material released over 10,000 years. Reporting performance standards that will be required by EPA are expected to result in releases and associated health consequences in the range between 10 and 100 premature cancer deaths with an upper limit of 1,000 premature cancer deaths world-wide for a 100,000 metric tonne (MTHM) repository.

Nevertheless, despite all the uncertainty, some judgement as to the regulatory NEPA implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and HLW disposal, this issue is considered Category 1.

Since the GEIS was originally issued in 1996, the EPA has published radiation protection standards for Yucca Mountain, Nevada, at 40 CFR Part 197 "Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada," on June 13,

2001 (66 FR 32132). The Energy Policy Act of 1992 (42 USC 10101 et seq.) directs that the NRC adopt these standards into its regulations for reviewing and licensing the repository. The NRC published its regulations at 10 CFR Part 63, on November 2, 2001 (66 FR 55792). These standards include the following: (1) 0.15 mSv/year (15 mrem/year) dose limit for members of the public during the storage period prior to repository closure, (2) 0.15 mSv/year (15 mrem/year) dose limit for the reasonably maximally exposed individual for 10,000 years following disposal, (3) 0.15 mSv/year (15 mrem/year) dose limit for the reasonably maximally exposed individual as a result of a human intrusion at or before 10,000 years after disposal, and (4) a groundwater protection standard that states for 10,000 years of undisturbed performance after disposal, radioactivity in a representative volume of ground water will not exceed (a) 0.0002 MBq/L (5 pCi/L) (radium-226 and radium-228), (b) 0.0006 Mbq/L (15 pCi/L) (gross alpha activity), and (c) 0.04 mSv/year (4 mrem/year) to the whole body or any organ (from combined beta and photon emitting radionuclides).

On February 15, 2002, subsequent to the receipt of a recommendation by Secretary Abraham, Department of Energy, the President recommended the Yucca Mountain site for the development of a repository for the geologic disposal of spent nuclear fuel and HLW. On July 23, 2002, the President signed into law House Joint Resolution 87 designating Yucca Mountain as the repository for spent nuclear fuel. This development does not represent new and significant information with respect to the offsite radiological impacts related to spent fuel and HLW disposal during the renewal term.

The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no offsite radiological impacts related to spent fuel and HLW disposal during the renewal term beyond those discussed in the GEIS.

- Nonradiological impacts of the uranium fuel cycle. Based on information in the GEIS, the Commission found that

  > The nonradiological impacts of the uranium fuel cycle resulting from the renewal of an operating license for any plant are found to be small.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no nonradiological impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

- Low-level waste storage and disposal. Based on information in the GEIS, the Commission found that

  > The comprehensive regulatory controls that are in place and the low public doses being achieved at reactors ensure that the radiological impacts to the environment will remain small during the term of a renewed license. The maximum additional on-site land that may be required for low-level waste storage during the term of a renewed license and associated impacts will be small. Nonradiological impacts on air and water will be negligible. The radiological and nonradiological environmental impacts of long-term disposal of low-level waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient low-level waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of low-level waste storage and disposal associated with the renewal term beyond those discussed in the GEIS.

- Mixed waste storage and disposal. Based on information in the GEIS, the Commission found that

  > The comprehensive regulatory controls and the facilities and procedures that are in place ensure proper handling and storage, as well as negligible doses and exposure to toxic materials for the public and the environment at all plants. License renewal will not increase the small, continuing risk to human health and the environment posed by mixed waste at all plants. The radiological and nonradiological environmental impacts of long-term disposal of mixed waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient mixed waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of mixed waste storage and disposal associated with the renewal term beyond those discussed in the GEIS.

- Onsite spent fuel. Based on information in the GEIS, the Commission found that

  > The expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated on site with small environmental effects through dry or pool storage at all plants if a permanent repository or monitored retrievable storage is not available.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of onsite spent fuel associated with license renewal beyond those discussed in the GEIS.

- Nonradiological waste. Based on information in the GEIS, the Commission found that

  > No changes to generating systems are anticipated for license renewal. Facilities and procedures are in place to ensure continued proper handling and disposal at all plants.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no nonradiological waste impacts during the renewal term beyond those discussed in the GEIS.

- Transportation. Based on information in the GEIS, the Commission found that

  > The impacts of transporting spent fuel enriched up to 5 percent uranium-235 with average burnup for the peak rod to current levels approved by NRC up to 62,000 MWd/MTU and the cumulative impacts of transporting HLW to a single repository, such as Yucca Mountain, Nevada are found to be consistent with the impact values contained in 10 CFR 51.52(c), Summary Table S-4 — Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor. If fuel enrichment or burnup conditions are not met, the applicant must submit an assessment of the implications for the environmental impact values reported in Sec. 51.52.

  Peach Bottom Units 2 and 3 meet the fuel-enrichment and burnup conditions set forth in Addendum 1 to the GEIS. The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or

its evaluation of other available information. Therefore, the staff concludes that there are no impacts of transportation associated with license renewal beyond those discussed in the GEIS.

There are no Category 2 issues for the uranium fuel cycle and solid waste management.

6.2 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy,* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

10 CFR Part 63. Code of Federal Regulations, Title 10, *Energy,* Part 63, "Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada."

40 CFR Part 191. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste."

40 CFR Part 197. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 197, "Public Health and Environmental Radiation Protection Standards for Management and Disposal for Yucca Mountain, Nevada."

66 FR 32132. "Public Health and Environmental Radiation Protection Standards for Yucca Mountain, NV." *Federal Register*. Vol. 66, No.114. June 13, 2001.

66 FR 55792 "Disposal of High-Level Radioactive Wastes in a Proposed Geologic Repository at Yucca Mountain, Nevada." *Federal Register*. Vol. 66, No. 213. November 2, 2001.

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Exelon Generation Company, LLC (Exelon). 2001. *Applicant's Environmental Report – Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

National Academy of Sciences (NAS). 1995. *Technical Bases for Yucca Mountain Standards*. Washington, D.C.

U.S. Department of Energy (DOE). 1980. *Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste*. DOE/EIS-0046F, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report*, "Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

7.0 Environmental Impacts of Decommissioning

Environmental issues associated with decommissioning, which result from continued plant operation during the renewal term are discussed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).[(a)] The GEIS includes a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS, Category 1 issues are those that meet all of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria for Category 1, and therefore, additional plant-specific review of these issues is required. There are no Category 2 issues related to decommissioning.

Category 1 issues in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B that are applicable to Peach Bottom Units 2 and 3 decommissioning following the renewal term are listed in Table 7-1. Exelon Generation Company, LLC (Exelon) stated in its Environmental Report (ER; Exelon 2001) that it is aware of no new and significant information regarding the environmental impacts of Peach Bottom Units 2 and 3 license renewal. The staff has not identified any significant new information during its independent review of the Exelon ER (Exelon 2001), the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts related to these issues beyond those discussed in

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1

the GEIS. For all of these issues, the staff concluded in the GEIS that the impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted.

Table 7-1. Category 1 Issues Applicable to the Decommissioning of Peach Bottom Units 2 and 3 Following the Renewal Term

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	GEIS Section
DECOMMISSIONING	
Radiation Doses	7.3.1; 7.4
Waste Management	7.3.2; 7.4
Air Quality	7.3.3; 7.4
Water Quality	7.3.4; 7.4
Ecological Resources	7.3.5; 7.4
Socioeconomic Impacts	7.3.7; 7.4

A brief description of the staff's review and the GEIS conclusions, as codified in Table B-1, for each of the issues follows:

- Radiation doses. Based on information in the GEIS, the Commission found that

> Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem [0.01 person-Sv] caused by buildup of long-lived radionuclides during the license renewal term.

The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no radiation doses associated with decommissioning following license renewal beyond those discussed in the GEIS.

- Waste management. Based on information in the GEIS, the Commission found that

  > Decommissioning at the end of a 20-year license renewal period would generate no more solid wastes than at the end of the current license term. No increase in the quantities of Class C or greater than Class C wastes would be expected.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of solid waste associated with decommissioning following the license renewal term beyond those discussed in the GEIS.

- Air quality. Based on information in the GEIS, the Commission found that

  > Air quality impacts of decommissioning are expected to be negligible either at the end of the current operating term or at the end of the license renewal term.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of license renewal on air quality during decommissioning beyond those discussed in the GEIS.

- Water quality. Based on information in the GEIS, the Commission found that

  > The potential for significant water quality impacts from erosion or spills is no greater whether decommissioning occurs after a 20-year license renewal period or after the original 40-year operation period, and measures are readily available to avoid such impacts.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of the license renewal term on water quality during decommissioning beyond those discussed in the GEIS.

- Ecological resources. Based on information in the GEIS, the Commission found that

  > Decommissioning after either the initial operating period or after a 20-year license renewal period is not expected to have any direct ecological impacts.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of the license renewal term on ecological resources during decommissioning beyond those discussed in the GEIS.

- Socioeconomic impacts. Based on information in the GEIS, the Commission found that

  > Decommissioning would have some short-term socioeconomic impacts. The impacts would not be increased by delaying decommissioning until the end of a 20-year relicense period, but they might be decreased by population and economic growth.

  The staff has not identified any new and significant information during its independent review of the Exelon ER, the staff's site visit, the scoping process, or its evaluation of other available information. Therefore, the staff concludes that there are no impacts of license renewal on the socioeconomic impacts of decommissioning beyond those discussed in the GEIS.

7.1 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

Exelon Generation Company, LLC (Exelon). 2001. *Applicant's Environmental Report – Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report*, "Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

8.0 Environmental Impacts of Alternatives to Operating License Renewal

This chapter examines the potential environmental impacts associated with denying the renewal of the operating licenses (OLs) (i.e., the no-action alternative); the potential environmental impacts from electric generating sources other than Peach Bottom Units 2 and 3; the possibility of purchasing electric power from other sources to replace power generated by Units 2 and 3 and the associated environmental impacts; the potential environmental impacts from a combination of generating and conservation measures; and other generation alternatives that were deemed unsuitable for replacement of power generated by Units 2 and 3. The environmental impacts are evaluated using the U.S. Nuclear Regulatory Commission's (NRC's) three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality guidelines and set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

SMALL - Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.

LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The impact categories evaluated in this chapter are the same as those used in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999)[(a)] with the additional impact category of environmental justice.

8.1 No-Action Alternative

The NRC's regulations implementing the National Environmental Policy Act (NEPA) specify that the no-action alternative be discussed in an NRC environmental impact statement (EIS) (10 CFR Part 51, Subpart A, Appendix A4). For license renewal, the no-action alternative refers to a scenario in which the NRC would not renew the Peach Bottom Units 2 and 3 OLs, and the Exelon Generation Company (Exelon) would then decommission Peach Bottom Units 2 and 3 when plant operations cease. Replacement of Peach Bottom Units 2 and 3 electricity

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

generation capacity would be met by (1) demand-side management (DSM) and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than Peach Bottom Units 2 and 3, or (4) some combination of these options.

Exelon will be required to comply with NRC decommissioning requirements whether or not the OLs are renewed. If the Peach Bottom Units 2 and 3 OLs are renewed, decommissioning activities may be postponed for up to an additional 20 years. If the OLs are not renewed, Exelon would conduct decommissioning activities according to the requirements in 10 CFR 50.82.

The environmental impacts associated with decommissioning under both license renewal and the no-action alternative would be bounded by the discussion of impacts in Chapter 7 of the GEIS, Chapter 7 of this Supplemental Environmental Impact Statement (SEIS), and the *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities*, NUREG-0586 dated August 1988.[(a)] The impacts of decommissioning after 60 years of operation are not expected to be significantly different from those occurring after 40 years of operation.

The environmental impacts for the socioeconomic, historic and archeological resources, and environmental justice impact categories are summarized in Table 8-1 and discussed in the following paragraphs.

Table 8-1. Summary of Environmental Impacts of the No-Action Alternative

Impact Category	Impact	Comment
Socioeconomic	SMALL to MODERATE	Decrease in Peach Bottom Township employment opportunities SMALL to MODERATE due to the general size and availability of other employment opportunities in the region. Impact on government budgets SMALL.
Historic and Archeological Resources	SMALL	Decommissioning would necessitate cultural resource investigations, determinations, and consultation requirements.
Environmental Justice	SMALL	Very few minority/low income persons in the immediate vicinity of the Peach Bottom site. Economic offset due to the general size and availability of other employment opportunities in the region.

(a) The NRC staff is currently supplementing NUREG-0586 for reactor decommissioning. In October 2001 the staff issued draft Supplement 1 to NUREG-0586 dealing with Decommissioning of Nuclear Power Reactors (NRC 2001a) for public comment. The staff is currently finalizing the draft supplement for publication as a final document.

- Socioeconomic. When Peach Bottom Units 2 and 3 cease operation, there will be a decrease in employment and tax revenues associated with the closure. These impacts would be most concentrated in York County with smaller impacts in Lancaster County and much smaller impacts in other counties. Most secondary employment impacts and impacts on population would also be concentrated in York and Lancaster counties. Approximately 66 percent of employees who work at Peach Bottom Units 2 and 3 live in York County or Lancaster County, and the remainder live in other locations (Exelon 2001). The extent of impacts on York County, particularly Peach Bottom Township, will depend to some degree on the extent to which economic and population growth projected for Peach Bottom Township materializes (see Section 2.2.8.6).

  The tax revenue losses resulting from closure of Peach Bottom Units 2 and 3 would occur in York County. In 2000, Exelon paid a combined $1.44 million in property taxes in York County to three government units for Peach Bottom Units 2 and 3, or about 0.6 percent of the combined operating budgets for these three government units (Table 2-9). The no-action alternative would result in the loss of these taxes, as well as the loss of plant payrolls 20 years earlier than if the OLs were renewed. Given the relatively low percentage of revenue in the three jurisdictions, the property tax revenue would have a SMALL impact on the ability to provide public services.

  There would be some adverse impacts on local housing values, the local economy in Peach Bottom Township, and county employment in York and Lancaster counties if Peach Bottom Units 2 and 3 were to cease operations. Exelon employees working at Peach Bottom Units 2 and 3 currently contribute time and money toward community involvement, including schools, churches, charities, and other civic activities. It is likely that with a reduced presence in the community following decommissioning, Exelon's community involvement efforts in the region would be lessened.

  If normal economic growth continues in York County and Lancaster County, the socioeconomic consequences of nonrenewal of the OLs could be partially or entirely offset by the new jobs created by such growth. What is not known are the types of jobs, pay scale, and location of the future employment increases. If some of the new jobs are skilled, higher-paying jobs, then the impacts of nonrenewal of the Peach Bottom Units 2 and 3 OLs could be significantly mitigated and the socioeconomic consequence of closure would be SMALL. If not offset by normal growth, impacts would be MODERATE.

- Historic and Archeological Resources. The potential for future adverse impacts to known or unrecorded cultural resources at Peach Bottom Units 2 and 3 following decommissioning will depend on the future use of the site land and on an analysis and determinations of the historic status of the plant (including the units for decommissioning). Following decommissioning, the site would likely be retained by Exelon. Eventual sale or transfer of

the site could result in adverse impacts to cultural resources if the land-use pattern changes dramatically. However, there are no known historic or archeological resources on the Peach Bottom site proper. The impacts of this alternative on historic and archeological resources are considered SMALL.

- Environmental Justice. Current operations at Peach Bottom Units 2 and 3 have no disproportionate impacts on the minority and low-income populations of the surrounding counties, and no environmental pathways have been identified that would cause disproportionate impacts. Closure of Units 2 and 3 would result in decreased employment opportunities and somewhat reduced tax revenues in York County, with possible SMALL negative and disproportionate impacts on minority or low-income populations. Because the Peach Bottom site is located in a relatively high-population area with extensive employment opportunities, these effects are likely to be offset by projected growth in the local economy, so that the impacts of closure on minority and low-income populations would be mitigated, regardless of whether the created jobs are low- or high-paying jobs. The environmental justice impacts under the no-action alternative are considered SMALL.

Impacts for all other impact categories would be SMALL, as shown in Table 9-1. In some cases, impacts associated with the no-action alternative would be positive. For example, closure of Peach Bottom Units 2 and 3 would eliminate any impingement and entrainment of fish and shellfish and also eliminate any negative impacts resulting from thermal discharges to Conowingo Pond.

8.2 Alternative Energy Sources

This section discusses the environmental impacts associated with alternative sources of electric power to replace the power generated by Peach Bottom Units 2 and 3, assuming that the OLs for Units 2 and 3 are not renewed. The order of presentation of alternative energy sources in Section 8.2 does not imply which alternative would be most likely to occur or to have the least environmental impacts. The following generation alternatives are considered in detail:

- coal-fired generation at the Peach Bottom site and at an alternate site (Section 8.2.1) (the Peach Bottom site is not feasible, as described in Section 8.2.1)
- natural gas-fired generation at the Peach Bottom site and at an alternate site (Section 8.2.2)
- nuclear generation at the Peach Bottom site and at an alternate site (Section 8.2.3)

The alternative of purchasing power from other sources to replace power generated at Peach Bottom Units 2 and 3 is discussed in Section 8.2.4. Other power generation alternatives and conservation alternatives considered by the staff and found not to be reasonable replacements

for Peach Bottom Units 2 and 3 are discussed in Section 8.2.5. Section 8.2.6 discusses the environmental impacts of a combination of generation and conservation alternatives.

Each year, the Energy Information Administration (EIA), a component of the U.S. Department of Energy (DOE), issues an Annual Energy Outlook. The *Annual Energy Outlook 2002 With Projections to 2020* was issued in December 2001 (DOE/EIA 2001a). In this report, EIA projects that combined-cycle[(a)] or combustion turbine technology fueled by natural gas is likely to account for approximately 88 percent of new electric generating capacity through the year 2020 (DOE/EIA 2001a). Both technologies are designed primarily to supply peak and intermediate capacity, but combined-cycle technology can also be used to meet baseload[(b)] requirements. Coal-fired plants are projected by EIA to account for approximately 9 percent of new capacity during this period. Coal-fired plants are generally used to meet baseload requirements. Renewable energy sources, primarily wind, geothermal, and municipal solid waste units, are projected by EIA to account for the remaining 3 percent of capacity additions. EIA's projections are based on the assumption that providers of new generating capacity will seek to minimize cost while meeting applicable environmental requirements. Combined-cycle plants are projected by EIA to have the lowest generation cost in 2005 and 2020, followed by coal-fired plants and then wind generation (DOE/EIA 2001a).

EIA projects that oil-fired plants will account for very little new generation capacity in the United States through the year 2020 because of higher fuel costs and lower efficiencies (DOE/EIA 2001a). However, oil as a back-up fuel to natural-gas-fired generation (combined cycle) is considered.

EIA also projects that new nuclear power plants will not account for any new generation capacity in the United States through the year 2020 because natural gas and coal-fired plants are projected to be more economical (DOE/EIA 2001a). In spite of this projection, a new nuclear plant alternative for replacing power generated by Peach Bottom Units 2 and 3 is considered in Section 8.2.3. Since 1997, the NRC has certified three new standard designs for nuclear power plants under the procedures in 10 CFR Part 52 Subpart B. These designs are the U.S. Advanced Boiling Water Reactor (10 CFR Part 52, Appendix A), the System 80+ Design (10 CFR Part 52, Appendix B), and the AP600 Design (10 CFR Part 52, Appendix C). The submission to the NRC of these three applications for certification indicates continuing interest in the possibility of licensing new nuclear power plants. NRC has established a New

(a) In the combined-cycle unit, hot combustion gases in a combustion turbine rotates the turbine to generate electricity. Waste combustion heat from the combustion turbine is routed through a heat-recovery boiler to make steam to generate additional electricity.

(b) A baseload plant normally operates to supply all or part of the minimum continuous load of a system and consequently produces electricity at an essentially constant rate. Nuclear power plants are commonly used for baseload generation; i.e., these units generally run near full load.

Reactor Licensing Project Office to prepare for and manage future reactor and site licensing applications (NRC 2001).

8.2.1 Coal-Fired Generation

The staff assumes construction of four standard 508-megawatts electric (MW(e)) units[(a)] as potential replacements for Units 2 and 3, which is consistent with Exelon's Environmental Report (ER; Exelon 2001).

Unless otherwise indicated, the assumptions and numerical values used in Section 8.2.1 are from the Exelon ER (Exelon 2001). The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the coal-fired alternative for 40 years is considered (as a reasonable projection of the operating life of a coal-fired plant).

The coal-fired alternative is analyzed for an alternate site on Conowingo Pond using once-through cooling. Although NRC pointed out that siting a new coal-fired plant where an existing nuclear plant is located would reduce many construction impacts (NRC 1996), it is unlikely that the coal-fired unit could fit and be operated efficiently on the Peach Bottom site, since the entire Peach Bottom site is only about 250 ha (620 ac). The land available for disposal of emission control waste (fly ash and scrubber sludge) is wooded and elevated substantially above the location of the operating nuclear reactors (about 91 m [300 ft]) (Exelon 2001). There would be associated environmental impacts and disposal would be quite difficult (e.g., pumping or hauling up steep hills).

Exelon did not identify any specific alternate sites, although if another site were chosen, adding units at other sites with existing Exelon generating units probably would be the least costly and have the least environmental impact. However, for purposes of bounding the environmental impacts, The NRC staff generally uses an unspecified "greenfield" (previously undeveloped) site for possible future generation additions to compare with the existing site. In this case, it is unlikely that a truly remote rural site would be chosen.

Construction at an alternate site would necessitate the construction of a transmission line to connect to existing lines to transmit power to Exelon's customers. Because Exelon does not have specific plans for constructing such a site, site-specific information is not available. For purposes of this analysis, Exelon's ER assumes the alternate site would be near the Peach Bottom site and construction would include approximately 24 km (15 mi) of transmission line in

(a) The gas-fired units would have a rating of 528 gross MW and 508 net MW. The coal-fired units would have a rating of 538 gross MW and 508 net MW. The difference between "gross" and "net" is the electricity consumed on site.

a corridor 106 m (350 ft) wide to tie into the existing transmission lines at the Peach Bottom site (259 ha [640 ac] of easement would be required). Also, the project would require constructing or upgrading an assumed 32 km (20 mile) rail spur in a corridor 30 m (100 ft) wide from an adequate existing rail line. The corridor would take 97 ha (240 ac) of land. The upgrade would include an offloading approach and a turnaround loop at the site (Exelon 2001).

Coal and lime (or limestone) would be delivered by rail via a nearby rail line to a new rail spur leading to the alternate site. The new spur would include an onsite access and turnaround system. Barge delivery is potentially feasible for a site on navigable waters, but not on Conowingo Pond. A coal slurry pipeline is another potential alternative for delivering coal. However, such a pipeline would need to cover a great distance to reach a suitable coal-mining area or the coal would need to be transported by alternative means (e.g., rail) to a site closer to Peach Bottom site for introduction into the pipeline. The coal slurry pipeline alternative for delivering coal is not considered a feasible alternative and is not further evaluated.

The coal-fired plant would consume approximately 6.0 million MT (6.6 million tons) per year of pulverized bituminous coal with an ash content of approximately 11.9 percent (Exelon 2001). The ER assumes a heat rate[(a)] of 3.0 J fuel/J electricity (10,200 Btu/kWh) and a capacity factor[(b)] of 0.85 (Exelon 2001). After combustion, 99.9 percent of the ash (708,000 MT or 784,000 tons) would be collected and disposed of at the plant site. In addition, approximately 658,000 MT (728,000 tons) of scrubber sludge would be disposed of at the plant site based on annual lime usage of approximately 222,000 MT (246,000 tons). Lime would be used in the scrubbing process for control of sulfur dioxide (SO_2) emissions.[(c)]

8.2.1.1 Once-Through Cooling System

For purposes of this SEIS, the staff assumed a coal-fired plant could use either a closed-cycle or a once-through cooling system.

The overall impacts of the coal-fired generating system are discussed in the following sections and summarized in Table 8-2. The extent of impacts at an alternate site would depend on the location of the particular site selected.

(a) Heat rate is a measure of generating station thermal efficiency. It is generally expressed in British thermal units (Btu) per net kilowatt-hour (kWh). It is computed by dividing the total Btu content of fuel burned for electric generation by the resulting net kWh generation.

(b) The capacity factor is the ratio of electricity generated, for the period of time considered, to the energy that could have been generated at continuous full-power operation during the same period.

(c) In a typical wet scrubber, lime (calcium hydroxide) or limestone (calcium carbonate) is injected as a slurry into the hot effluent combustion gases to remove entrained sulfur dioxide. The lime-based scrubbing solution reacts with sulfur dioxide to form calcium sulfite, which precipitates out and is removed in sludge form.

- **Land Use**

  The coal-fired generation alternative would necessitate converting roughly an additional 728 ha (1800 ac) of the site to industrial use for the plant, coal storage, and ash and scrubber sludge disposal. Additional land-use changes would occur offsite in an undetermined coal-mining area to supply coal for the plant. In the GEIS, the staff estimated that approximately 8900 ha (22,000 ac) would be affected for mining the coal and disposing of the waste to support a coal plant during its operational life (NRC 1996). Partially offsetting this offsite land use would be the elimination of the need for uranium mining to supply fuel for Units 2 and 3. In the GEIS, the staff estimated that approximately 400 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000 MW(e) nuclear power plant.

  If coal is delivered by rail, an additional approximately 97 ha (240 ac) would be needed for a rail spur, assuming that the alternate site location is within 32 km (20 mi) from the nearest railway connection. Depending particularly on transmission line and rail line routing, this alternative would result in MODERATE to LARGE land-use impacts.

Table 8-2. **Summary of Environmental Impacts of Coal-Fired Generation at an Alternate Site Using Once-Through Cooling**

Impact Category	Impact	Comments
Land Use	MODERATE to LARGE	Uses approximately 1084 ha (2680 ac), for plant infrastructure and waste disposal, transmission line, and rail spur. Additional land impacts for coal and limestone mining.
Ecology	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission line route; potential habitat loss and fragmentation; reduced productivity and biological diversity.
Water Use and Quality (Surface Water)	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged and the characteristics of the surface water body.
Water Use and Quality (Groundwater)	SMALL to LARGE	Impacts SMALL if only used for potable water; impacts could be MODERATE to LARGE if groundwater is used as make-up water (impacts would be site/aquifer specific).

Table 8-2. (contd)

Impact Category	Impact	Comments
Air Quality	MODERATE	Sulfur oxides • 12,050 MT/yr (13,344 tons/yr) Nitrogen oxides • 11,550 MT/yr (12,794 tons/yr) Particulates • 354 MT/yr (392 tons/yr) of total suspended particulates which would include • 81 MT/yr (90 tons/yr) of PM_{10} Carbon monoxide • 1490 MT/yr (1649 tons/yr) Small amounts of mercury and other hazardous air pollutants and naturally occurring radioactive materials – mainly uranium and thorium.
Waste	MODERATE	Total waste volume would be approximately 708,000 MT/yr (784,000 tons/yr) of ash, spent catalyst, and 658,000 MT/yr (728,000 tons/yr) of scrubber sludge requiring approximately 324 ha (800 ac) for disposal during the 40-year life of the plant.
Human Health	SMALL	Impacts are uncertain, but considered SMALL in the absence of more quantitative data.
Socioeconomics	SMALL to LARGE	During construction, impacts would be MODERATE to LARGE. Up to 2500 workers during the peak of the 5-year construction period at alternate site followed by reduction from current Peach Bottom Units 2 and 3 work force of about 1000 to 300; tax base (which may be in York County) preserved. Impacts during operation would be SMALL. Tax impacts on receiving county could be SMALL to LARGE.

Table 8-2. (contd)

Impact Category	Impact	Comments
	SMALL to LARGE	Transportation impacts during operation would be SMALL to MODERATE. Transportation impacts associated with construction workers could be MODERATE to LARGE. Construction impacts depend on location, but could be LARGE if plant is located in a rural area. For rail transportation of coal and lime/limestone, the impact is considered MODERATE to LARGE.
Aesthetics	MODERATE	Exhaust stacks will be visible from nearby local parks. Power block and stacks would be visible at a moderate distance. Impact would depend on the site selected and the surrounding land features. If needed, a new transmission line or rail spur would add to the aesthetic impact. Rail transportation of coal and lime/limestone would have a MODERATE aesthetic impact.
Historic and Archeological Resources	SMALL	Alternate location would necessitate cultural resource studies, determinations and consultation requirements. Studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant on undeveloped sites for cultural resources. Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL to MODERATE	Impacts on minority and low-income communities will vary depending on population distribution and makeup at the site. Some impacts on housing may occur during construction; loss of about 700 operating jobs at Peach Bottom Units 2 and 3 could slightly reduce employment prospects for minority and low-income populations in York and Lancaster counties and could be offset by projected economic growth and the ability of affected workers to commute to other jobs.

- **Ecology**

  Locating a coal-fired plant at the alternate site would alter ecological resources because of the need to convert roughly 728 ha (1800 ac) of land at the site to industrial use for plant,

coal storage, and ash and scrubber sludge disposal. However, some of this land might have been previously disturbed.

At an alternate site, the coal-fired generation alternative would introduce construction impacts and new incremental operational impacts. Even assuming siting at a previously disturbed area, the impacts would alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity.

Use of cooling makeup water from a nearby surface water body could have adverse aquatic resource impacts. Ecological impacts associated with transporting coal and lime to the alternate would be significant. The rail option was assumed to involve constructing a rail spur with an assumed length of 32 km (20 mi). Construction and maintenance of an additional transmission line and a rail spur would have ecological impacts. Overall, the ecological impacts at an alternate site would be MODERATE to LARGE.

- **Water Use and Quality**

Exelon has stated a preference for an (unspecified) alternate site on Conowingo Pond, where once-through cooling could be used. An alternate site might use a closed-cycle cooling system with cooling towers. For an alternate site, the impact on the surface water would depend on the volume of water needed, the discharge volume, and the characteristics of the receiving body of water. Intake from and discharge to any surface body of water would be regulated by the Commonwealth of Pennsylvania or another state. The impacts would be SMALL to MODERATE.

No groundwater is currently used for operation of Peach Bottom Units 2 and 3. Use of groundwater for a coal-fired plant sited at an alternate site is a possibility. Any groundwater withdrawal would require a permit from the local permitting authority. The impacts of withdrawal for the coal-fired plant on the aquifer would be site-specific and dependent on aquifer recharge and other withdrawals. The overall impacts would be SMALL to LARGE.

- **Air Quality**

The air-quality impacts of coal-fired generation vary considerably from those of nuclear generation due to emissions of sulfur oxides (SO_x), nitrogen oxides (NO_x), particulates, carbon monoxide, hazardous air pollutants such as mercury, and naturally occurring radioactive materials.

A new coal-fired generating plant located in southern Pennsylvania would likely need a prevention of significant deterioration (PSD) permit and an operating permit under the Clean Air Act. The plant would need to comply with the new source performance standards for

such plants set forth in 40 CFR Part 60 Subpart Da. The standards establish limits for particulate matter and opacity (40 CFR 60.42a), SO_2 (40 CFR 60.43a), and NO_x (40 CFR 60.44a).

The U.S. Environmental Protection Agency (EPA) has various regulatory requirements for visibility protection in 40 CFR Part 51 Subpart P, including a specific requirement for review of any new major stationary source in an area designated as attainment or unclassified under the Clean Air Act. All of south-central Pennsylvania, as defined in 40 CFR 81.105, is classified as attainment or unclassified for criteria pollutants, except that Lancaster County and Franklin County are non-attainment areas for ozone, and Lancaster County and the West York Borough and West Manchester Township in York County do not meet secondary standards for TSP (40 CFR 81.339). With prevailing winds from the west, a coal-fired power plant in York County could cause further deterioration in Lancaster County air quality, which is already marginal.

Section 169A of the Clean Air Act (42 USC 7491) establishes a national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas when impairment results from man-made air pollution. In addition, EPA issued a new regional haze rule in 1999 (64 FR 35714). The rule specifies that for each mandatory Class I Federal area located within a state, the state must establish goals that provide for reasonable progress towards achieving natural visibility conditions. The reasonable progress goals must provide for an improvement in visibility for the most-impaired days over the period of the implementation plan and ensure no degradation in visibility for the least-impaired days over the same period [40 CFR 51.308(d)(1)]. If a new coal-fired power station were located close to a mandatory Class I area, additional air pollution control requirements could be imposed. However, there are no Federal Class I areas in Pennsylvania or near the Peach Bottom site.

In 1998 EPA issued a rule requiring 22 eastern states, including Pennsylvania, to revise their state implementation plans (SIPs) to reduce nitrogen oxide emissions. Nitrogen oxide emissions contribute to violations of the national ambient air quality standard for ozone. The total amount of nitrogen oxides that can be emitted by each of the 22 states in the year 2007 ozone season (May 1 through September 30) is set out at 40 CFR 51.121(e). For Pennsylvania, the amount is 233,547 MT (257,441 tons). Any new coal-fired plant sited in Pennsylvania would be subject to this limitation.

Effective September 20, 2001, EPA approved a SIP revision for the control of NO_x in Pennsylvania (66 FR 43795). Under the revised SIP, Pennsylvania will implement NO_x Budget Trading Program rules under EPA's NO_x Budget Trading Program (40 CFR Part 96). The revised plan establishes and requires a NO_x allowance and trading program for large electric generation and industrial units beginning in 2003. The rules establish a

fixed statewide electric generating unit emissions budget of 42,840 MT (47,224 tons) of NO_x per ozone season. New units do not receive allowances, but are required to have allowances to cover their NO_X emissions. Owners of new units over 25MW(e) capacity must therefore acquire allowances from owners of other power plants by purchase or reduce NO_x emissions at other power plants they own. Thus, a new coal-fired power plant would not add to net statewide NO_x emissions, although it might do so locally. Regardless, NO_x emissions would be greater for the coal alternative than the OL renewal alternative.

Impacts for particular pollutants are as follows:

Sulfur oxides. Exelon states in its ER that an alternative coal-fired plant located at the Peach Bottom site would use a wet scrubber (Exelon 2001). Lime/limestone would be used for flue gas desulfurization (Exelon 2001).

A new coal-fired power plant would be subject to the requirements in Title IV of the Clean Air Act. Title IV was enacted to reduce emissions of SO_2 and NO_x, the two principal precursors of acid rain, by restricting emissions of these pollutants from power plants. Title IV caps aggregate annual power plant SO_2 emissions and imposes controls on SO_2 emissions through a system of marketable allowances. EPA issues one allowance for each ton of SO_2 that a unit is allowed to emit. New units do not receive allowances, but are required to have allowances to cover their SO_2 emissions. Owners of new units must therefore acquire allowances from owners of other power plants by purchase or reduce SO_2 emissions at other power plants they own. Allowances can be banked for use in future years. Thus, a new coal-fired power plant would not add to net regional SO_2 emissions, although it might do so locally. Regardless, SO_2 emissions would be greater for the coal alternative than the OL renewal alternative.

Exelon estimates that by using the best technology to minimize SO_2 emissions, the total annual stack emissions would be approximately 12,050 MT (13,344 tons) of SO_2 (Exelon 2001).

Nitrogen oxides. Section 407 of the Clean Air Act establishes technology-based emission limitations for NO_x emissions. The market-based allowance system used for SO_2 emissions is not used for NO_x emissions. A new coal-fired power plant would be subject to the new source performance standards for such plants at 40 CFR 60.44a(d)(1). This regulation, issued on September 16, 1998 (63 FR 49453 [EPA 1998]), limits the discharge of any gases that contain nitrogen oxides (expressed as NO_2) in excess of 200 ng/J of gross energy output (1.6 lb/MWh), based on a 30-day rolling average.

Exelon estimates that using the best available control technology, the total annual NO_x emissions for a new coal-fired power plant would be approximately 11,550 MT (12,744 tons)

(Exelon 2001). This level of NO_x emissions would be greater than the OL renewal alternative.

Particulates. Exelon estimates that the total annual stack emissions would include 354 MT (392 tons) of filterable total suspended particulates (particulates that range in size from less than 0.1 micrometer [μm] up to approximately 45 μm). The 354 MT (392 tons) would include 81 MT (90 tons) of particulate matter having an aerodynamic diameter less than or equal to 10 μm (PM_{10}). Fabric filters or electrostatic precipitators would be used for control. In addition, coal-handling equipment would introduce fugitive particulate emissions (Exelon 2001). Particulate emissions would be greater under the coal alternative than the OL renewal alternative.

During the construction of a coal-fired plant, fugitive dust would be generated. In addition, exhaust emissions would come from vehicles and motorized equipment used during the construction process.

Carbon monoxide. Exelon estimates that the total carbon monoxide emissions would be approximately 1490 MT (1649 tons) per year (Exelon 2001). This level of emissions is greater than the OL renewal alternative.

Hazardous air pollutants including mercury. In December 2000, the EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000b). EPA determined that coal- and oil-fired electric utility steam-generating units are significant emitters of hazardous air pollutants. Coal-fired power plants were found by EPA to emit arsenic, beryllium, cadmium, chromium, dioxins, hydrogen chloride, hydrogen fluoride, lead, manganese, and mercury (EPA 2000b). EPA concluded that mercury is the hazardous air pollutant of greatest concern. EPA found that (1) there is a link between coal consumption and mercury emissions; (2) electric utility steam-generating units are the largest domestic source of mercury emissions; and (3) certain segments of the U.S. population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures resulting from consumption of contaminated fish (EPA 2000b). Accordingly, EPA added coal- and oil-fired electric utility steam-generating units to the list of source categories under Section 112(c) of the Clean Air Act for which emission standards for hazardous air pollutants will be issued (EPA 2000b).

Uranium and thorium. Coal contains uranium and thorium. Uranium concentrations are generally in the range of 1 to 10 parts per million. Thorium concentrations are generally about 2.5 times greater than uranium concentrations (Gabbard 1993). One estimate is that a typical coal-fired plant released roughly 4.7 MT (5.2 tons) of uranium and 11.6 MT (12.8 tons) of thorium in 1982 (Gabbard 1993). The population dose equivalent from the

uranium and thorium releases and daughter products produced by the decay of these isotopes has been calculated to be significantly higher than that from nuclear power plants (Gabbard 1993).

Carbon dioxide. A coal-fired plant would also have unregulated carbon dioxide emissions that could contribute to global warming.

Summary. The GEIS analysis did not quantify emissions from coal-fired power plants, but implied that air impacts would be substantial. The GEIS also mentioned global warming from unregulated carbon dioxide emissions and acid rain from SO_x and NO_x emissions as potential impacts (NRC 1996). Adverse human health effects from coal combustion such as cancer and emphysema have been associated with the products of coal combustion. The appropriate characterization of air impacts from coal-fired generation would be MODERATE. The impacts would be clearly noticeable, but would not destabilize air quality.

- **Waste**

Coal combustion generates waste in the form of ash, and equipment for controlling air pollution generates additional ash, spent selective catalytic reduction catalyst, and scrubber sludge. Four 508-MW(e) coal-fired units would generate approximately 708,000 MT (784,000 tons) of this waste annually. The waste would be disposed of onsite, accounting for approximately 324 ha (800 ac) of land area over the 40-year plant life (Exelon 2001). Waste impacts to groundwater and surface water could extend beyond the operating life of the plant if leachate and runoff from the waste storage area occurs. Disposal of the waste could noticeably affect land use and groundwater quality, but with appropriate management and monitoring, it would not destabilize any resources. After closure of the waste site and revegetation, the land could be available for other uses.

In May 2000, the EPA issued a "Notice of Regulatory Determination on Wastes From the Combustion of Fossil Fuels" (EPA 2000a). The EPA concluded that some form of national regulation is warranted to address coal combustion waste products because (1) the composition of these wastes could present danger to human health and the environment under certain conditions; (2) EPA has identified eleven documented cases of proven damages to human health and the environment by improper management of these wastes in landfills and surface impoundments; (3) present disposal practices are such that, in 1995, these wastes were being managed in 40 percent to 70 percent of landfills and surface impoundments without reasonable controls in place, particularly in the area of groundwater monitoring; and (4) EPA identified gaps in state oversight of coal combustion wastes. Accordingly, EPA announced its intention to issue regulations for disposal of coal combustion waste under subtitle D of the Resource Conservation and Recovery Act.

For all of the preceding reasons, the appropriate characterization of impacts from waste generated from burning coal is MODERATE; the impacts would be clearly noticeable, but would not destabilize any important resource.

- **Human Health**

Coal-fired power generation introduces worker risks from coal and limestone mining, worker and public risks from coal and lime/limestone transportation, worker and public risks from disposal of coal combustion wastes, and public risks from inhalation of stack emissions. Emission impacts can be widespread and health risks difficult to quantify. The coal alternative also introduces the risk of coal-pile fires and attendant inhalation risks.

The staff stated in the GEIS that there could be human health impacts (cancer and emphysema) from inhalation of toxins and particulates from coal-fired plants, but did not identify the significance of these impacts (NRC 1996). In addition, the discharges of uranium and thorium from coal-fired plants can potentially produce radiological doses in excess of those arising from nuclear power plant operations (Gabbard 1993).

Regulatory agencies, including EPA and State agencies, set air emission standards and requirements based on human health impacts. These agencies also impose site-specific emission limits as needed to protect human health. As discussed previously, EPA has recently concluded that certain segments of the U.S. population (e.g., the developing fetus and subsistence fish-eating populations) are believed to be at potential risk of adverse health effects due to mercury exposures from sources such as coal-fired power plants. However, in the absence of more quantitative data, human health impacts from radiological doses and inhaling toxins and particulates generated by burning coal are characterized as SMALL.

- **Socioeconomics**

Construction of the coal-fired alternative would take approximately 5 years. The staff assumed that construction would take place while Peach Bottom Units 2 and 3 continued operation and would be completed by the time Units 2 and 3 permanently cease operations. The work force would be expected to vary between 1200 and 2500 workers during the 5-year construction period (NRC 1996). If the alternate site were near the Peach Bottom site, then these workers would be in addition to the approximately 1000 workers employed at Units 2 and 3. During construction of the new coal-fired plant, surrounding communities would experience demands on housing and public services that could have MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from other parts of York County, Lancaster County, Baltimore, Philadelphia, and other

nearby areas. After construction, the nearby communities would be impacted by the loss of the construction jobs.

During the 5-year construction period for the replacement coal-fired units, 2500 construction workers could place significant traffic loads on existing highways near the Peach Bottom site. Such impacts would be MODERATE to LARGE.

Construction of a replacement power plant at an alternate site not near the Peach Bottom site would mean that the communities around the Peach Bottom site would still experience the impact of Peach Bottom Units 2 and 3 operational job loss as in the no-action alternative (although potentially tempered by projected economic growth), and the communities around the new site would have to absorb the impacts of a large, temporary work force (up to 2500 workers at the peak of construction) and a permanent work force of approximately 300 workers. In the GEIS, the staff stated that socioeconomic impacts at a rural site would be larger than at an urban site, because more of the peak construction work force would need to move to the area to work. The Peach Bottom site is within commuting distance of the Philadelphia and Baltimore metropolitan areas and is therefore not considered a rural site. Alternate sites would need to be analyzed on a case-by-case basis. Socioeconomic impacts at an isolated rural site could be LARGE.

Transportation-related impacts associated with commuting construction workers at an alternate site would be site dependent, but could be MODERATE to LARGE.

Transportation impacts related to commuting of plant operating personnel would also be site dependent, but can be characterized as SMALL to MODERATE.

At most alternate sites, coal and lime would likely be delivered by rail, although barge delivery is feasible for a location on navigable waters. Transportation impacts would depend upon the site location. Approximately 600 trains per year would be needed to deliver the coal and lime/limestone for the four coal-fired units - because for each full train delivery there would be an empty return train. On several days per week, there could be four trains per day using the rail spur to the alternate site. Socioeconomic impacts associated with rail transportation would likely be MODERATE to LARGE. Barge delivery of coal and lime/limestone would likely have SMALL socioeconomic impacts.

- **Aesthetics**

The four coal-fired power plant units could be as much as 60 m (200 ft) tall and could be visible in daylight hours offsite. The four exhaust stacks would be 120 to 185 m (400 to 600 ft) high. Given the low elevation at the site and of the surrounding land, the stacks would be highly visible in daylight hours for distances up to 16 km (10 mi). If the coal-fired

plant were near the Peach Bottom site, the stacks would be visible from Conowingo Pond and Susqehannock State Park. The plant units and associated stacks would also be visible at night because of outside lighting. The Federal Aviation Administration (FAA) generally requires that all structures exceeding an overall height of 61 m (200 ft) above ground level have markings and/or lighting so as not to impair aviation safety (FAA 2000). Visual impacts of a new coal-fired plant could be mitigated by landscaping and color selection for buildings that is consistent with the environment. Visual impact at night could be mitigated by reduced use of lighting, provided the lighting meets FAA requirements, and appropriate use of shielding. Overall, the addition of the coal-fired units and the associated exhaust stacks would likely have a MODERATE aesthetic impact.

Coal-fired generation would introduce mechanical sources of noise that would be audible offsite. Sources contributing to total noise produced by plant operation are classified as continuous or intermittent. Continuous sources include the mechanical equipment associated with normal plant operations. Intermittent sources include the equipment related to coal handling, solid-waste disposal, transportation related to coal and lime/limestone delivery, use of outside loudspeakers, and the commuting of plant employees. The incremental noise impacts of a coal-fired plant compared to existing Peach Bottom Units 2 and 3 operations are considered to be MODERATE.

At an alternate site, there would be an aesthetic impact from the buildings and exhaust stacks. There would be an aesthetic impact associated with construction of an assumed new 32-km (20-mi) rail spur and 25-km (15-mi) transmission line to connect to other lines and enable delivery of electricity to the grid. Noise impacts associated with rail delivery of coal and lime/limestone would be most significant for residents living in the vicinity of the facility and along the rail route. Although noise from passing trains significantly raises noise levels near the rail corridor, the short duration of the noise reduces the impact. Nevertheless, given the frequency of train transport and the fact that many people are likely to be within hearing distance of the rail route, the impacts of noise on residents in the vicinity of the facility and the rail line is considered MODERATE. Noise associated with barge transportation of coal and lime/limestone would be SMALL. Noise and light from the plant would be detectable offsite. Aesthetic impacts at the plant site would be mitigated if the plant were located in an industrial area adjacent to other power plants. Overall, the aesthetic impacts associated with locating at an alternate site can be categorized as MODERATE.

- **Historic and Archeological Resources**

At an alternate site, a cultural resource inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification

and recording of existing historic and archeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

Before construction at an alternate site, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other rights-of-way). Historic and archeological resource impacts can generally be effectively managed and as such are considered SMALL.

- **Environmental Justice**

No environmental pathways or locations have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement coal-fired plant were built at the Peach Bottom site. Other impacts, such as impacts on housing availability and prices during construction, might occur, and this could disproportionately affect minority and low-income populations. If the replacement plant is in the vicinity of the Peach Bottom site, closure of Peach Bottom Units 2 and 3 would result in a decrease in employment of approximately 1000 operating employees (same as in the No-Action case), offset by other economic growth related to construction and operation of the replacement power plant. Overall, impacts would be SMALL to MODERATE, and would depend on the extent to which projected economic growth is realized and the ability of minority or low-income populations to commute to other jobs outside the area.

Impacts at the alternate site would depend upon the site chosen and the nearby population distribution but are likely to also be SMALL to MODERATE.

8.2.1.2 Closed-Cycle Cooling System

The environmental impacts of constructing a coal-fired generation system at an alternate site using closed-cycle cooling with cooling towers are essentially the same as the impacts for a coal-fired plant using the once-through system. However, there are some environmental differences between the closed-cycle and once-through cooling systems. Table 8-3 summarizes the incremental differences.

Table 8-3. Summary of Environmental Impacts of Coal-Fired Generation at an Alternate Site with Closed-Cycle Cooling System Using Cooling Towers

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 to 12 additional ha (25 to 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impact would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated by the State. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation from cooling towers.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Introduction of cooling towers and associated plume. Natural draft towers could be up to 158 m (520 ft) high. Mechanical draft towers could be up to 30 m (100 ft) high and also have an associated noise impact.
Historic and Archeological Resources	No change
Environmental Justice	No change

8.2.2 Natural-Gas-Fired Generation

The environmental impacts of the natural-gas-fired alternative are examined in this section for both the Peach Bottom site and an alternate site. For the Peach Bottom site, the staff assumed that the plant would use the existing once-through cooling canal system.

Exelon concluded in its ER that the Peach Bottom site would be a reasonable site for location of a natural-gas-fired generating unit. Based on the PECO *Gas Fired Power Plant Guide* (PECO Energy 1999), Exelon chose to evaluate gas-fired generation, using combined-cycle turbines. Exelon determined that the technology is mature, economical, and feasible. The *Gas Fired Power Plant Guide* indicates that standard-sized gas-fired units of 508 MW(e) are readily

available and economical. Therefore, Exelon analyzed 2032 MW of net power, consisting of four 508-MW(e) gas-fired units located on Peach Bottom property (Exelon 2001). Exelon realized that gas availability would be questionable.[(a)]. It would require a new, dedicated high-pressure 61-cm (24-inch) pipeline to tie into the nearby (about 5 km [3 mi] distant) Transco gas pipelines. In the winter, when demand for natural gas is high, it might become necessary for Exelon to operate on fuel oil, which would have higher costs and more emissions than gas.

The staff assumed that a replacement natural-gas-fired plant would use combined-cycle technology (Exelon 2001). In a combined-cycle unit, hot combustion gases in a combustion turbine rotate the turbine to generate electricity. Waste combustion heat from the combustion turbine is routed through a heat-recovery boiler to make steam to generate additional electricity. The following additional assumptions are made for the natural-gas-fired plant (Exelon 2001):

- four 508-MW(e) units, each consisting of two 168-MW combustion turbines and a 172-MW heat recovery boiler
- natural gas with an average heating value of 38.6 MJ/m^3 (1035 Btu/ft^3) as the primary fuel
- use of low-sulfur No. 2 fuel oil as backup fuel
- heat rate of 2 J fuel/J electricity (6928 Btu/kWh)
- capacity factor of 0.85

Unless otherwise indicated, the assumptions and numerical values used throughout this section are from the Exelon ER (Exelon 2001). The staff reviewed this information and compared it to environmental impact information in the GEIS. Although the OL renewal period is only 20 years, the impact of operating the natural-gas-fired alternative for 40 years is considered (as a reasonable projection of the operating life of a natural-gas-fired plant).

(a) In November, 2000, Conectiv Energy announced that representatives from York County Economic Development Corporation and Conectiv had been in discussion regarding the company's preliminary interest in locating a state-of-the-art $600 million, 1100 megawatt combustion turbine combined cycle power plant in the southern part of the county near Delta. If built, this plant would be about half of the size of the possible Peach Bottom Units 2 and 3 replacement and would add to any demand for gas and environmental impacts, but would offset negative socioeconomic impacts associated with the no-action alternative.

8.2.2.1 Once-Through Cooling System

The overall impacts of the natural-gas-fired generating system are discussed in the following sections and summarized in Table 8-4. The extent of impacts at an alternate site will depend on the location of the particular site selected.

- **Land Use**

  Natural-gas-fired generation at the Peach Bottom site and at an alternate location would require converting approximately 45 ha (110 ac) for power block, offices, roads, and parking areas. At the Peach Bottom site, this much previously disturbed land is available. For the Peach Bottom site, there would be an additional land use impact of up to approximately 22 ha (54 ac) for construction of a 3-mile branch gas pipeline to the plant site.

  For construction at an alternate site, the staff assumed that 45 ha (110 ac) would be needed for the plant and associated infrastructure (NRC 1996). Approximately 259 ha (640 ac) of additional land could be impacted for construction of a transmission line, assuming a 25-km (15-mi) line. Additional land could be required for natural gas wells and collection stations. In the GEIS, the staff estimated that approximately 1500 ha (3600 ac) would be needed for a 1000-MW(e) plant (NRC 1996). Proportionately more land would be needed for a natural-gas-fired plant replacing the 2032 MW(e) from Peach Bottom Units 2 and 3. Partially offsetting these offsite land requirements would be the elimination of the need for uranium mining to supply fuel for Units 2 and 3. In the GEIS (NRC 1996), the staff estimated that approximately 400 ha (1000 ac) would be affected for mining the uranium and processing it during the operating life of a 1000-MW(e) nuclear power plant. Overall, land-use impacts at both the Peach Bottom site and the alternate site would be SMALL to MODERATE.

Table 8-4. Summary of Environmental Impacts of Natural Gas-Fired Generation at the Peach Bottom Site and an Alternate Site Using Once-Through Cooling

	Peach Bottom Site		Alternate Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	SMALL to MODERATE	45 ha (110 ac) for power block, offices, roads, and parking areas. Additional impact of up to approximately 22 ha (54 ac) for construction of a 3-mile branch underground gas pipeline.	SMALL to MODERATE	45 ha (110 ac) for power-block, offices, roads, and parking areas. Additional impact for construction and/or upgrade of an underground gas pipeline, if required. Transmission line likely could be placed in existing corridors.
Ecology	SMALL	Uses previously-disturbed areas at current Peach Bottom site. Some effects from 3 miles of gas pipeline construction.	SMALL to MODERATE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission and pipeline routes; potential habitat loss and fragmentation; reduced productivity and biological diversity. Likely plant sites already have power generation facilities.
Water Use and Quality (Surface Water)	SMALL	Uses existing once-through cooling system.	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge and characteristics of surface water body.
Water Use and Quality (Groundwater)	SMALL	Use of groundwater very unlikely.	SMALL to LARGE	Groundwater may be used. Impacts SMALL if only used for potable water; impacts could be MODERATE to LARGE if groundwater is used as make-up cooling water (impacts would be site/aquifer specific)
Air Quality	MODERATE	Sulfur oxides • 111 MT/yr (123 tons/yr) Nitrogen oxides • 417 MT/yr (462 tons/yr) Carbon monoxide • 548 MT/yr (607 tons/yr) PM_{10} particulates • 62 MT/yr (67 tons/yr) Some hazardous air pollutants	MODERATE	Same emissions as Peach Bottom site.

Table 8-4. (contd)

	Peach Bottom Site		Alternate Site	
Impact Category	**Impact**	**Comments**	**Impact**	**Comments**
Waste	SMALL	Minimal waste product from fuel combination.	SMALL	Minimal waste product from fuel combination.
Human Health	SMALL	Impacts considered to be minor.	SMALL	Impacts considered to be minor.
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 1200 additional workers during the peak of the 3-year construction period, followed by reduction from current Peach Bottom Units 2 and 3 work force of about 1000 to 150; tax base preserved. Impacts during operation would be SMALL. Transportation impacts during operation would be SMALL due to the smaller workforce. Transportation impacts associated with construction workers would be SMALL to MODERATE.	SMALL to MODERATE	During construction, impacts would be MODERATE. Up to 1200 additional workers during the peak of the 3-year construction period. York County would experience loss of tax base and employment, potentially offset by projected economic growth. Transportation impacts associated with construction workers would be SMALL to MODERATE.
Aesthetics	SMALL	SMALL aesthetic impact due to impact of plant units and stacks. Visual impact would be similar to current Peach Bottom Units 2 and 3.	MODERATE	Impact would depend on location. Greatest impact likely would be from the new 25-km (15-mi) transmission line that would be needed.
Historic and Archeological Resources	SMALL	Any potential impacts can likely be effectively managed.	SMALL	Any alternate location would necessitate cultural resource studies, determinations and consultation requirements. Potential impacts can likely be effectively managed.

Table 8-4. (contd)

Impact Category	Peach Bottom Site		Alternate Site	
	Impact	Comments	Impact	Comments
Environmental Justice	SMALL	Impacts on minority and low-income communities should be similar to those experienced by the population as a whole. Some impacts on housing may occur during construction; loss of about 850 operating jobs at Peach Bottom Units 2 and 3 could reduce employment prospects for minority and low-income populations. Impacts would be offset by projected economic growth and the ability of affected workers to commute to other jobs.	SMALL to MODERATE	Impacts vary depending on population distribution and characteristics at site.

- **Ecology**

  At the Peach Bottom site, there would be ecological land-related impacts from siting of a gas-fired plant and branch pipeline. Ecological impacts at an alternate site would depend on the nature of the land converted for the plant and the possible need for a new transmission line and/or gas pipeline. If a natural-gas-fired plant were located at an alternate site there is a reasonable likelihood that the plant would be located adjacent to an existing power plant on previously disturbed land, which would tend to mitigate impacts. Construction of a transmission line and construction and/or upgrading of the gas pipeline to serve the plant would be expected to have temporary ecological impacts. Ecological impacts to the site and utility easements could include impacts on threatened or endangered species, wildlife habitat loss and reduced productivity, habitat fragmentation, and a local reduction in biological diversity. At an alternate site, cooling water intake and discharge could have aquatic resource impacts. Overall, the ecological impacts are considered SMALL at the Peach Bottom site and SMALL to MODERATE at an alternative site.

- **Water Use and Quality**

  Surface Water. Each of the gas-fired units would include a heat-recovery boiler from which steam would turn an electric generator. Steam would be condensed and circulated back to the boiler for reuse. A natural-gas-fired plant sited at Peach Bottom is assumed to use the existing cooling canal system. Surface-water impacts are expected to remain SMALL; the

impacts would be sufficiently minor that they would not noticeably alter any important attribute of the resource.

A natural-gas-fired plant at an alternate site might use a closed-cycle cooling system with mechanical draft cooling towers. The staff assumed that for alternate sites, the impact on the surface water would depend on the discharge volume and the characteristics of the receiving body of water to be used for cooling makeup water and discharge. Intake and discharge would involve relatively small quantities of water compared to the coal alternative. Intake from and discharge to any surface body of water would be regulated by the Commonwealth of Pennsylvania.

Some erosion and sedimentation probably would occur during construction (NRC 1996). The overall impacts to surface water quality are characterized as SMALL to MODERATE.

Groundwater. No groundwater is currently used for operation of Peach Bottom Units 2 and 3. It is unlikely that groundwater would be used for an alternative natural-gas-fired plant sited at Peach Bottom. The overall impacts would be SMALL.

A natural-gas-fired plant sited at an alternate site may use groundwater. Any groundwater withdrawal may require a permit from the local permitting authority. The impacts of such a withdrawal at an alternate site would be site-specific and dependent on the recharge rate and other withdrawal rates from the aquifer; however, it is unlikely that groundwater would be used for cooling water with once-through cooling. The overall impacts could be considered SMALL.

- **Air Quality**

Natural gas is a relatively clean-burning fuel. The gas-fired alternative would release similar types of emissions, but in lesser quantities than the coal-fired alternative. Hence, it would be subject to the same type of air quality regulations as a coal-fired plant.

A new gas-fired generating plant located in south-central Pennsylvania would likely need a PSD permit and an operating permit under the Clean Air Act. A new combined-cycle natural-gas-fired generating plant would also be subject to the new source performance standards for such units at 40 CFR Part 60, Subparts Da and GG. These regulations establish emission limits for particulates, opacity, SO_2, and NO_x.

Exelon projects the following emissions for the natural-gas-fired alternative (Exelon 2001):

Sulfur oxides - 111 MT/yr (123 tons/yr)
Nitrogen oxides - 417 MT/yr (462 tons/yr)
Carbon monoxide - 548 MT/yr (607 tons/yr)
PM_{10} particulates - 62 MT/yr (69 tons/yr)

A natural-gas-fired plant would also have unregulated carbon dioxide emissions that could contribute to global warming.

In December 2000, EPA issued regulatory findings on emissions of hazardous air pollutants from electric utility steam-generating units (EPA 2000b). Natural-gas-fired power plants were found by EPA to emit arsenic, formaldehyde, and nickel (EPA 2000b). Unlike coal and oil-fired plants, EPA did not determine that emissions of hazardous air pollutants from natural-gas-fired power plants should be regulated under Section 112 of the Clean Air Act.

Construction activities would result in temporary fugitive dust. Exhaust emissions would also come from vehicles and motorized equipment used during the construction process.

The preceding emissions would likely be the same at the Peach Bottom site or at an alternate site. Impacts from the above emissions would be clearly noticeable, but would not be sufficient to destabilize air resources as a whole. The overall air-quality impact for a new natural-gas-generating plant sited at Peach Bottom or at an alternate site is considered MODERATE.

- **Waste**

  There will be small amounts of solid-waste products (i.e., ash) from burning natural gas fuel. In the GEIS, the staff concluded that waste generation from gas-fired technology would be minimal (NRC 1996). Gas firing results in very few combustion by-products because of the clean nature of the fuel. Waste generation at an operating gas-fired plant would be largely limited to typical office wastes. Construction-related debris would be generated during construction activities. Overall, the waste impacts would be SMALL for a natural-gas-fired plant sited at Peach Bottom or at an alternate site.

- **Human Health**

  In the GEIS, the staff identifies cancer and emphysema as potential health risks from gas-fired plants (NRC 1996). The risk may be attributable to NO_x emissions that contribute to ozone formation, which in turn contribute to health risks. NO_x emissions from the plant would be regulated. For a plant sited in Pennsylvania, NO_x emissions would be regulated by the Pennsylvania Department of Environmental Protection (PDEP). Human health effects are not expected to be detectable or would be sufficiently minor that they would neither destabilize nor noticeably alter any important attribute of the resource. Overall, the impacts on human health of the natural-gas-fired alternative sited at Peach Bottom or at an alternate site are considered SMALL.

- **Socioeconomics**

Construction of a natural-gas-fired plant would take approximately 3 years. Peak employment would be approximately 1200 workers (NRC 1996). The staff assumed that construction would take place while Peach Bottom Units 2 and 3 continue operation and would be completed by the time Peach Bottom Units 2 and 3 permanently ceases operations. During construction, the communities surrounding the Peach Bottom site would experience demands on housing and public services that could have SMALL to MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from other parts of York County or from other counties. After construction, the communities would be impacted by the loss of jobs. The current Peach Bottom Units 2 and 3 work force (about 1000 workers) would decline through a decommissioning period to a minimal maintenance size. The new gas-fired plant would provide a replacement tax base at the Peach Bottom site or an alternate site and approximately 150 new permanent jobs. For siting at an alternate site, impacts in York County resulting from loss of Peach Bottom Units 2 and 3 may be offset by economic growth projected to occur in the county.

In the GEIS (NRC 1996), the staff concluded that socioeconomic impacts from constructing a natural gas-fired plant would not be very noticeable and that the small operational work force would have the lowest socioeconomic impacts of any nonrenewable technology (NRC 1996). Compared to the coal-fired and nuclear alternatives, the smaller size of the construction work force, the shorter construction time frame, and the smaller size of the operations work force would mitigate socioeconomic impacts.

Overall, gas-fired generation socioeconomic impacts associated with construction and operation of a natural gas-fired power plant would be SMALL to MODERATE for siting at Peach Bottom or SMALL to MODERATE at an alternate site. Depending on other growth in the area, socioeconomic effects could be noticed, but they would not destabilize any important socioeconomic attribute.

Transportation impacts associated with construction personnel commuting to the plant site would depend on the population density and transportation infrastructure in the vicinity of the site. Transportation impacts can be classified as SMALL to MODERATE for siting at Peach Bottom. The impacts can be classified as SMALL to MODERATE for siting at an alternate site, depending on the characteristics of the site.

- **Aesthetics**

The turbine buildings (approximately 30 m [100 ft] tall) and exhaust stacks (approximately 38 m [125 ft] tall) would be visible during daylight hours from Conowingo Pond, but depending on placement of the units, might not be visible otherwise offsite because of topography. The gas pipeline compressors would be visible. Noise and light from the plant would be detectable offsite. At the Peach Bottom site, these impacts would result in SMALL aesthetic impacts.

At an alternate site, the buildings, stacks, and the associated transmission line and gas pipeline compressors would be visible offsite. The impact of noise and light visual impact of a new 25-km (15-mi) transmission line would be MODERATE. Aesthetic impacts would be mitigated if the plant were located in an industrial area adjacent to other power plants. Overall, the aesthetic impacts associated with locating at an alternate site can be categorized as MODERATE. The likely greatest contributor to this categorization is the aesthetic impact of the new transmission line needed to connect the plant to the power grid.

- **Historic and Archeological Resources**

  At both the Peach Bottom site and an alternate site, a cultural resource inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

  Before construction at the Peach Bottom site or an alternate site, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission and pipeline corridors, or other rights-of-way). Impacts to cultural resources can be effectively managed under current laws and regulations and kept SMALL.

- **Environmental Justice**

  No environmental pathways or locations have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement natural-gas-fired plant were built at the Peach Bottom site. Other impacts, such as impacts on housing availability and prices during construction, might occur, and this could disproportionately affect minority and low-income populations. Closure of Peach Bottom Units 2 and 3 would result in a decrease in employment of approximately 850 operating employees, possibly offset by general growth in the York County area. Following construction, it is possible that the ability of the local government to maintain social services could be reduced at the same time as diminished economic conditions reduce employment prospects for minority or low-income populations in York County. Overall, however, impacts are expected to be SMALL. Projected economic growth in York and Lancaster counties and the ability of minority and low-income populations to commute to other jobs outside the area could mitigate any adverse effects.

  Impacts at an alternate site would depend upon the site chosen and the nearby population distribution, but are likely to also be SMALL to MODERATE.

8.2.2.2 Closed-Cycle Cooling System

This section discusses the environmental impacts of constructing a natural-gas-fired generation system at an alternate site using closed-cycle cooling with cooling towers. The impacts of this option are essentially the same as the impacts for a natural-gas-fired plant using once-through cooling. However, there are minor environmental differences between the closed-cycle and once-through cooling systems. Table 8.5 summarizes the incremental differences.

Table 8-5. Summary of Environmental Impacts of Natural Gas-Fired Generation at an Alternate Site with Closed-Cycle Cooling Towers

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 to 12 additional ha (25 to 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impact would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated by the State. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation from cooling towers.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Introduction of cooling towers and associated plumes. Possible noise impact from operation of cooling towers.
Historic and Archeological Resources	No change
Environmental Justice	No change

8.2.3 Nuclear Power Generation

Since 1997, the NRC has certified three new standard designs for nuclear power plants under 10 CFR Part 52, Subpart B. These designs are the U.S. Advanced Boiling Water Reactor (10 CFR Part 52, Appendix A), the System 80+ Design (10 CFR Part 52, Appendix B), and the AP600 Design (10 CFR Part 52, Appendix C). All of these plants are light-water reactors. Although no applications for a construction permit or a combined license based on these certified designs have been submitted to NRC, the submission of the design certification applications indicates continuing interest in the possibility of licensing new nuclear power plants. In addition, recent volatility of natural gas and electricity have made new nuclear power plant construction more attractive from a cost standpoint. Consequently, construction of a new nuclear power plant at the Peach Bottom site using the existing cooling canal system and at an alternate site using both closed- and open-cycle cooling are considered in this section. The staff assumed that the new nuclear plant would have a 40-year lifetime.

The NRC summarized environmental data associated with the uranium fuel cycle in Table S-3 of 10 CFR 51.51. The impacts shown in Table S-3 are representative of the impacts that would be associated with a replacement nuclear power plant built to one of the certified designs, sited at Peach Bottom or an alternate site. The impacts shown in Table S-3 are for a 1000-MW(e) reactor and would need to be adjusted to reflect replacement of Units 2 and 3, which have a net capacity of 1093 MW(e). The environmental impacts associated with transporting fuel and waste to and from a light-water cooled nuclear power reactor are summarized in Table S-4 of 10 CFR 51.52. The summary of NRC's findings on NEPA issues for license renewal of nuclear power plants in Table B-1 of 10 CFR Part 51 Subpart A, Appendix B, is also relevant, although not directly applicable, for consideration of environmental impacts associated with the operation of a replacement nuclear power plant. Additional environmental impact information for a replacement nuclear power plant using once-through cooling is presented in Section 8.2.3.1 and using closed-cycle cooling in Section 8.2.3.2.

8.2.3.1 Once-Through Cooling System

The overall impacts of the nuclear generating system are discussed in the following sections. The impacts are summarized in Table 8-6. The extent of impacts at an alternate site will depend on the location of the particular site selected.

Table 8-6. Summary of Environmental Impacts of New Nuclear Power Generation at Peach Bottom Site and an Alternate Site Using Once-Through Cooling

	Peach Bottom Site		Alternate Site	
Category	**Impact**	**Comments**	**Impact**	**Comments**
Land Use	MODERATE	Requires approximately 200 to 400 ha (500 to 1000 ac) for the plant and 400 ha (1000 ac) for uranium mining.	MODERATE to LARGE	Same as Peach Bottom site, plus land for transmission line (259 ha [640 ac] assuming a 25 km [15 mi] line)
Ecology	MODERATE	Uses undeveloped areas at current Peach Bottom site.	MODERATE to LARGE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission line routes; potential habitat loss and fragmentation; reduced productivity and biological diversity.
Water Use and Quality (Surface water)	SMALL	Uses existing cooling canal system.	SMALL to MODERATE	Impact will depend on the volume of water withdrawn and discharged and the characteristics of the surface water body.
Water Use and Quality (Groundwater)	SMALL	No groundwater used at the Peach Bottom site.	SMALL to LARGE	Groundwater may be used. Impacts SMALL if only used for potable water; impacts could be MODERATE to LARGE if groundwater is used as make-up cooling water (impacts would be site/aquifer specific)
Air Quality	SMALL	Fugitive emissions and emissions from vehicles and equipment during construction. Small amount of emissions from diesel generators and possibly other sources during operation. Emissions are similar as current releases at Peach Bottom Units 2 and 3.	SMALL	Same impacts as at Peach Bottom site.

Table 8-6. (contd)

	Peach Bottom Site		Alternate Site	
Category	**Impact**	**Comments**	**Impact**	**Comments**
Waste	SMALL	Waste impacts for an operating nuclear power plant are set out in 10 CFR Part 51, Appendix B, Table B-1. Debris would be generated and removed during construction.	SMALL	Same impacts as at Peach Bottom site.
Human Health	SMALL	Human health impacts for an operating nuclear power plant are set out in 10 CFR Part 51, Appendix B, Table B-1.	SMALL	Same impacts as at Peach Bottom site.
Socioeconomics	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Up to 2500 workers during peak period of the 5-year construction period. Operating work force assumed to be similar to Peach Bottom Units 2 and 3; tax base preserved. Impacts during operation would be SMALL.	MODERATE to LARGE	Construction impacts depend on location. Impacts at a rural location could be LARGE. York County would experience loss of tax base and employment with MODERATE impacts, potentially offset by projected economic growth.
	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE. Transportation impacts of commuting workers during operations would be SMALL.	SMALL to LARGE	Transportation impacts associated with construction workers could be MODERATE to LARGE. Transportation impacts of commuting workers during operations would be SMALL.

Table 8-6. (contd)

Category	Peach Bottom Site		Alternate Site	
	Impact	Comments	Impact	Comments
Aesthetics	SMALL to MODERATE	No exhaust stacks or cooling towers would be needed. Daytime visual impact could be mitigated by landscaping and appropriate color selection for buildings. Visual impact at night could be mitigated by reduced use of lighting and appropriate shielding. Noise impacts would be relatively small and could be mitigated.	SMALL to LARGE	Impacts would depend on the characteristics of the alternate site. Impacts would be SMALL if the plant is located adjacent to an industrial area. New transmission lines would add to the impacts and could be MODERATE. If a greenfield site is selected, the impacts could be LARGE.
Historic and Archeological Resources	SMALL	Any potential impacts can likely be effectively managed.	SMALL	Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL to MODERATE	Impacts on minority and low-income communities should be similar to those experienced by the population as a whole. Some impacts on housing may occur during construction.	SMALL to LARGE	Impacts will vary depending on population distribution and makeup at the site. Impacts to minority and low-income residents of south York County associated with closure of Peach Bottom Units 2 and 3 could be MODERATE, but could also be mitigated by projected economic growth for the area. Impacts to receiving county are site-specific and could range from SMALL to LARGE.

- **Land Use**

  The existing facilities and infrastructure at the Peach Bottom site would be used to the extent practicable, limiting the amount of new construction that would be required. Specifically, the staff assumed that a replacement nuclear power plant would use the existing cooling canal system, switchyard, offices, and transmission line right-of-way. A replacement nuclear power plant at the Peach Bottom site would require approximately 200 to 400 ha (500 to 1000 ac) of new land, some of which may be previously undeveloped land. It is not clear whether there is enough usable land for replacement units at the Peach Bottom site. Additional land beyond the current Peach Bottom site boundary may be needed to construct a new nuclear power plant while the existing Units 2 and 3 continue to operate.

There would be no net change in land needed for uranium mining because land needed to supply the new nuclear plant would offset land needed to supply uranium for fueling the existing Peach Bottom Units 2 and 3 reactors.

The impact of a replacement nuclear generating plant on land use at the existing Peach Bottom site is best characterized as MODERATE. The impact would be greater than the OL renewal alternative.

Land-use requirements at an alternate site would be 200 to 400 ha (500 to 1000 ac) plus the possible need for land for a new transmission line. Assuming a 25-km (15-mi) transmission line, an additional 259 ha (640 ac) would be needed. In addition, it may be necessary to construct a rail spur to an alternate site to bring in equipment during construction. Depending particularly on transmission line routing, siting a new nuclear plant at an alternate site would result in MODERATE to LARGE land-use impacts, and probably would be LARGE for a greenfield site.

- **Ecology**

Locating a replacement nuclear power plant at the Peach Bottom site would alter ecological resources because of the need to convert additional land to industrial use. Some of this land, however, would have been previously disturbed.

Siting at Peach Bottom would have a MODERATE ecological impact that would be greater than renewal of the Unit 2 and 3 OLs.

At an alternate site, there would be construction impacts and new incremental operational impacts. Even assuming siting at a previously disturbed area, the impacts would alter the ecology. Impacts could include wildlife habitat loss, reduced productivity, habitat fragmentation, and a local reduction in biological diversity. Use of cooling water from a nearby surface water body could have adverse aquatic resource impacts. Construction and maintenance of the transmission line would have ecological impacts. Overall, the ecological impacts at an alternate site would be MODERATE to LARGE.

- **Water Use and Quality**

Surface water. A replacement nuclear power plant located at the Peach Bottom site is assumed to use the existing once-through cooling system. It would obtain potable, process, and fire-protection water from the Susquehanna River in a manner similar to the current practice for Peach Bottom Units 2 and 3. Thus, the environmental impacts would be similar to the existing Peach Bottom Units 2 and 3 nuclear plant. Surface-water impacts

are expected to remain SMALL; the impacts would be sufficiently minor that they would not noticeably alter any important attribute of the resource.

For a replacement reactor located at an alternate site, the staff assumed that a closed-cycle cooling system would be employed. New intake structures would need to be constructed to provide water needs for the facility. Impacts would depend on the volume of water withdrawn for makeup, relative to the amount available from the intake source and the characteristics of the surface water. Plant discharges would be regulated by the Commonwealth of Pennsylvania or other jurisdiction. Some erosion and sedimentation would likely occur during construction. The impacts would be SMALL.

Groundwater. No groundwater is currently used for operation of Peach Bottom Units 2 and 3. It is unlikely that groundwater would be used for an alternative nuclear power plant sited at Peach Bottom, so the impacts would be SMALL. A nuclear power plant sited at an alternate site may use groundwater. Groundwater withdrawal would require a permit from the local permitting authority. The impacts of such a withdrawal rate on an aquifer would be site specific and dependent on aquifer recharge and other withdrawal rates from the aquifer; however, it is unlikely that groundwater would be used in a once-through cooling system. The overall impacts likely would be SMALL.

- **Air Quality**

Construction of a new nuclear plant at the Peach Bottom site or an alternate site would result in fugitive emissions during the construction process. Exhaust emissions would also come from vehicles and motorized equipment used during the construction process. An operating nuclear plant would have minor air emissions associated with diesel generators. These emissions would be regulated. Emissions for a plant sited in Pennsylvania would be regulated by the Pennsylvania Department of Environmental Protection. Overall, emissions and associated impacts are considered SMALL.

- **Waste**

The waste impacts associated with operation of a nuclear power plant are set out in Table B-1 of 10 CFR Part 51 Subpart A, Appendix B. In addition to the impacts shown in Table B-1, construction-related debris would be generated during construction activities and removed to an appropriate disposal site. Overall, waste impacts are considered SMALL.

Siting the replacement nuclear power plant at a site other than Peach Bottom would not alter waste generation. Therefore, the impacts would be SMALL.

- **Human Health**

  Human health impacts for an operating nuclear power plant are identified in 10 CFR Part 51 Subpart A, Appendix B, Table B-1. Overall, human health impacts are considered SMALL.

  Siting the replacement nuclear power plant at a site other than Peach Bottom would not alter human health impacts. Therefore, the impacts would be SMALL.

- **Socioeconomics**

  The construction period and the peak work force associated with construction of a new nuclear power plant are currently unquantified (NRC 1996). In the absence of quantified data, the staff assumed a construction period of 5 years and a peak work force of 2500. The staff assumed that construction would take place while the existing nuclear units continue operation and would be completed by the time Peach Bottom Units 2 and 3 permanently cease operations. During construction, the communities surrounding the Peach Bottom site would experience demands on housing and public services that could have SMALL to MODERATE impacts. These impacts would be tempered by construction workers commuting to the site from other counties. After construction, the communities would be impacted by the loss of the construction jobs, although this loss could be offset by other growth currently being projected for York and Lancaster counties.

  The replacement nuclear units are assumed to have an operating work force comparable to the approximately 1000 workers currently working at Peach Bottom Units 2 and 3. The replacement nuclear units would provide a new tax base to offset the loss of tax base associated with decommissioning of Peach Bottom Units 2 and 3. The appropriate characterization of non-transportation socioeconomic impacts for operating replacement nuclear units constructed at the Peach Bottom site would be SMALL to MODERATE.

  During the 5-year construction period, up to 2500 construction workers would be working at the Peach Bottom site in addition to the approximately 1000 workers at Units 2 and 3. The addition of the construction workers could place significant traffic loads on existing highways, particularly those leading to the Peach Bottom site. Such impacts would be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would be similar to current impacts associated with operation of Units 2 and 3 and are considered SMALL.

  Construction of a replacement nuclear power plant at an alternate site would relocate some socioeconomic impacts, but would not eliminate them. The communities around the Peach Bottom site would still experience the impact of Peach Bottom Units 2 and 3 operational job loss (although potentially tempered by projected economic growth), and the communities around the new site would have to absorb the impacts of a large, temporary

work force (up to 2500 workers at the peak of construction) and a permanent work force of approximately 1000 workers. In the GEIS (NRC 1996), the staff noted that socioeconomic impacts at a rural site would be larger than at an urban site because more of the peak construction work force would need to move to the area to work. The Peach Bottom site is within commuting distance of the Baltimore and Philadelphia metropolitan areas and is therefore not considered a rural site. Alternate sites would need to be analyzed on a case-by-case basis. Socioeconomic impacts at rural sites could be LARGE.

Transportation-related impacts associated with commuting workers at an alternate site are site dependent, but could be MODERATE to LARGE. Transportation impacts related to commuting of plant operating personnel would also be site dependent, but can be characterized as SMALL.

- **Aesthetics**

Depending upon how they were placed on the site (on the river or on the bluff above the river), the containment buildings for a replacement nuclear power plant sited at Peach Bottom and other associated buildings could be visible in daylight hours over many miles. The nuclear units would also likely be visible at night because of outside lighting. Visual impacts could be mitigated by landscaping and selecting a color for buildings that is consistent with the environment. Visual impact at night could be mitigated by reduced use of lighting and appropriate use of shielding. No exhaust stacks would be needed. No cooling towers would be needed, assuming use of the existing once-through cooling system.

A replacement nuclear plant sited at Peach Bottom would be visible from Conowingo Pond. However, with appropriate mitigation, the visual impact can be kept SMALL to MODERATE.

Noise from operation of a replacement nuclear power plant would potentially be audible by visitors to Conowingo Pond. Mitigation measures, such as reduced or no use of outside loudspeakers, can be employed to reduce noise level and keep the impact SMALL.

At an alternate site, depending on placement, there would be an aesthetic impact from the buildings. There would also be a significant aesthetic impact associated with construction of a new 25-km (15-mi) transmission line to connect to other lines to enable delivery of electricity. Noise and light from the plant would be detectable offsite. The impact of noise and light would be mitigated if the plant is located in an industrial area adjacent to other power plants, in which case the impact could be SMALL. The impact could be MODERATE if a transmission line needs to be built to the alternate site. The impact could be LARGE if a greenfield site is selected.

- **Historic and Archeological Resources**

  At both the Peach Bottom site and an alternate site, a cultural resources inventory would likely be needed for any onsite property that has not been previously surveyed. Other lands, if any, that are acquired to support the plant would also likely need an inventory of field cultural resources, identification and recording of existing historic and archeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site.

  Before construction at the Peach Bottom site or another site, studies would likely be needed to identify, evaluate, and address mitigation of the potential impacts of new plant construction on cultural resources. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other rights-of-way). Historic and archeological resource impacts can generally be effectively managed and as such are considered SMALL.

- **Environmental Justice**

  No environmental pathways or locations have been identified that would result in disproportionately high and adverse environmental impacts on minority and low-income populations if a replacement nuclear plant were built at the Peach Bottom site. Other impacts, such as impacts on housing availability and prices during construction, might occur, and this could disproportionately affect the minority and low-income populations. After completion of construction, it is possible that the ability of the local government to maintain social services could be reduced at the same time as diminished economic conditions reduce employment prospects for the minority and low-income populations. Overall, impacts are expected to be SMALL to MODERATE. Projected economic growth in York County and the ability of minority and low-income populations to commute to other jobs outside the York County area could mitigate any adverse effects.

  Impacts at an alternate site would depend upon the site chosen and the nearby population distribution. If a replacement nuclear plant were constructed at an alternate site, York County, Delta, and South Eastern School District could experience a loss of property tax revenue, which could affect their ability to provide services and programs. However, because the tax revenue attributable to Peach Bottom Units 2 and 3 is a relatively small percentage of total tax revenue for each jurisdiction, the impacts to minority and low-income populations are expected to be SMALL to MODERATE. Impacts to minority and low-income residents of York County associated with closure of Peach Bottom Units 2 and 3 could be MODERATE, but could also be mitigated by projected economic growth for

the area. Impacts to the receiving county could be SMALL to LARGE, depending on the relative increase to the tax base resulting from the new plant's construction, and its siting.

8.2.3.2 Closed-Cycle Cooling System

This section discusses the environmental impacts of constructing a nuclear power plant at an alternate site using closed-cycle cooling. The impacts of this option are essentially the same as the impacts for a nuclear power plant using once-through cooling. However, there are minor environmental differences between the closed-cycle and once-through cooling systems. Table 8.7 summarizes the incremental differences.

Table 8-7. Summary of Environmental Impacts of a New Nuclear Power Plant Sited at an Alternate Site with Closed-Cycle Cooling

Impact Category	Change in Impacts from Once-Through Cooling System
Land Use	10 to 12 additional ha (25 to 30 ac) required for cooling towers and associated infrastructure.
Ecology	Impacts would depend on ecology at the site. Additional impact to terrestrial ecology from cooling tower drift. Reduced impact to aquatic ecology.
Surface Water Use and Quality	Discharge of cooling tower blowdown containing dissolved solids. Discharge would be regulated by the Commonwealth of Pennsylvania. Decreased water withdrawal and less thermal load on receiving body of water. Consumptive use of water due to evaporation from cooling towers.
Groundwater Use and Quality	No change
Air Quality	No change
Waste	No change
Human Health	No change
Socioeconomics	No change
Aesthetics	Introduction of cooling towers and associated plume. Natural draft towers could be up to 158 m (520 ft). Mechanical draft towers could be up to 30 m (100 ft) high and also have an associated noise impact.
Historic and Archeological Resources	No change
Environmental Justice	No change

8.2.4 Purchased Electrical Power

If available, purchased power from other sources could potentially obviate the need to renew the Peach Bottom Units 2 and 3 OLs. It is unlikely, however, that sufficient baseload power supply would be available to replace the Units 2 and 3 capacity.

Exelon has evaluated conventional and prospective power supply options that could be reasonably implemented before the current Peach Bottom Units 2 and 3 licenses expire (in 2013 for Unit 2 and in 2014 for Unit 3). Because Pennsylvania is a net exporter of power and would be fully deregulated, Exelon assumes that in-state power could be purchased. For example, in 1997 Pennsylvania exported 137 million kilowatt hours (kWh) (DOE/EIA 2000b). This is less than 1 percent of what Peach Bottom Units 2 and 3 generates annually (approximately 16,400 gigawatt hours). It would probably require new construction to provide replacement capacity for Peach Bottom Units 2 and 3 (2186 MW(e) net). Power is exported from Pennsylvania because it has been purchased by consumers and is not excess power available to replace existing capacity. The NRC staff evaluated the environmental impacts of thirteen alternative energy sources in Section 8.3 of the GEIS. Exelon assumed that the generating technology producing purchased power would be one of the alternatives that the NRC staff analyzed. For this reason, Exelon adopted by reference, as representative of the purchased power alternative, the GEIS description of the alternative generating technologies. Of these technologies, simple-cycle combustion turbines or combined-cycle facilities fueled by natural gas were found to be the most cost-effective. There has been a corresponding decreased incentive for boilers fired by coal or residual oil. Although purchased power could provide replacement power for Peach Bottom Units 2 and 3, Exelon identified drawbacks to this alternative. They include the following:

- Utility generators providing power to Exelon would need to increase their capacity with new power units. For the reasons discussed in Sections 8.2.1 - 8.2.3, and 8.2.5, construction of a new generating station is not a preferable alternative to license renewal of Peach Bottom Units 2 and 3.

- Deregulation in Pennsylvania was expected to be fully in place by 2001. Under deregulation, non-utility generators could compete directly with utility companies for the generation market. This is expected to decrease non-utility generators' incentives to provide wholesale power to utility companies.

To replace Peach Bottom Units 2 and 3 capacity with imported power, Exelon might need to construct a new 500 kV transmission line which, assuming a 106 m (350 ft) easement width, the transmission line would impact approximately 10.6 ha per km (16.1 ac/mi).

Imported power from Canada or Mexico is unlikely to be available for replacement of Peach Bottom Units 2 and 3 capacity. In Canada, 62 percent of the country's electricity capacity is

derived from renewable energy sources, principally hydropower (DOE/EIA 2001b). Canada has plans to continue developing hydroelectric power, but the plans generally do not include large-scale projects (DOE/EIA 2001b). Canada's nuclear generation is projected to increase by 1.7 percent by 2020, but its share of power generation in Canada is projected to decrease from 14 percent currently to 13 percent by 2020 (DOE/EIA 2001b). EIA projects that total gross U.S. imports of electricity from Canada and Mexico will gradually increase from 47.9 billion kWh in year 2000 to 66.1 billion kWh in year 2005, and then gradually decrease to 47.4 billion kWh in year 2020 (DOE/EIA 2001a). On balance, it is unlikely that electricity imported from Canada or Mexico would be able to replace Peach Bottom Units 2 and 3 capacity.

If power to replace Peach Bottom Units 2 and 3 capacity were to be purchased from sources within the United States or a foreign country, the generating technology likely would be one of those described in this SEIS and in the GEIS (probably coal, natural gas, or nuclear). The description of the environmental impacts of other technologies in Chapter 8 of the GEIS is representative of the purchased electrical power alternative to renewal of the Peach Bottom Units 2 and 3 OLs. Thus, the environmental impacts of imported power would still occur, but would be located elsewhere within the region, nation, or another country.

8.2.5 Other Alternatives

Other generation technologies considered by NRC are discussed in the following subsections.

8.2.5.1 Oil-Fired Generation

EIA projects that oil-fired plants will account for very little of the new generation capacity in the United States through the year 2020 because of higher fuel costs and lower efficiencies (DOE/EIA 2001a). Nevertheless, an oil-fired generating alternative at the Peach Bottom site for replacement of power generated by Peach Bottom Units 2 and 3 is considered in this section.

Exelon has several oil-fired units; however, they produce only about 2 percent of Exelon's power generation. The cost of oil-fired operation is more expensive than nuclear or coal-fired operation. In addition, future increases in oil prices are expected to make oil-fired generation increasingly more expensive than coal-fired generation. The high cost of oil has prompted a steady decline in its use for electricity generation. From 1997 to 1998, production of electricity by oil-fired plants dropped by about 11 percent in Pennsylvania (DOE/EIA 1998). For these reasons, oil-fired generation is not an economically feasible alternative to Peach Bottom Units 2 and 3 license renewal.

Also, construction and operation of an oil-fired plant would have environmental impacts. In Section 8.3.11 of the GEIS, the staff estimated that construction of a 1,000-MWe oil-fired plant would require about 120 ac. Additionally, operation of oil-fired plants would have environmental

impacts (including impacts on the aquatic environment and air) that would be similar to those from a coal-fired plant.

8.2.5.2 Wind Power

According to the Wind Energy Resource Atlas of the United States (National Renewable Energy Laboratory 2000) areas suitable for wind energy applications must be wind power class 3 or higher. Approximately 50 percent of the land area in Pennsylvania has a wind power classification of 3 or higher and, therefore, may be suitable for wind energy applications. However, many of the wind power class 3 areas are located in the Allegheny and Appalachian Mountains along sharp ridgelines at the highest elevations, which is confirmed by the Pennsylvania Wind Map available from the Pennsylvania Department of Environmental Protection (PDEP 2002). Many of these sites may be unsuitable for wind turbines. Accessing many of the best wind energy ridgelines would require extensive road building, as well as land clearing (for tower and blades) and leveling (for the tower bases and associated facilities) in very steep terrain. While not impossible, this is expected to be very costly. Therefore, many of the ridgelines with good wind resources may not be practical based on likely costs and environmental impacts.

Several ridge top wind farms are in various stages of development for Exelon and others in northeastern and southwestern Pennsylvania and in nearby states. Somerset is 9 MW, Mill Run is 15 MW, Pocono is 60 MW, Moosic Mountain is 50 MW, Backbone (in West Virginia) is 65 MW, and Mountaineer (in West Virginia to open in the spring of 2003) is 66 MW (Exelon Corporation 2002; Community Energy, Inc. 2002). Exelon claims a total wind generation portfolio of 175 MW (Exelon Corporation 2002). These are considered among the best sites in the Eastern United States. The replacement of Peach Bottom Units 2 and 3 capacity of 2186 MW would require an additional 36 wind farms of the size stated for the West Virginia site or replicating the entire existing Exelon wind resource 12 times to produce the necessary generating capacity.

Based on figures available in the NUREG-1437, Chapter 8, the amount of land dedicated to wind facilities would be about 61 ha (134 ac) per MW based on the Altamont Pass, California, facility. It is likely that new wind farms would use larger turbine units of 1 MW to 1.5 MW to generate power, thereby reducing the “footprint” on the ground. Based on the latest Storm Mountain proposal in West Virginia, the total land needed might be only 18 Ha (40 ac) per MW. Even this lower figure results in a need for 153 square miles of land to replace Peach Bottom Units 2 and 3 capacity. This is clearly a large potential impact on land use and ecological resources.

About 1500 to 2200 wind towers would have to be installed to replace Peach Bottom Units 2 and 3 capacity. Wind turbines typically operate at a 30 to 35 percent capacity factor compared to 90 to 95 percent for a baseload plant (NWPPC 2000). This relatively low capacity factor is

the result of an intermittent resource, not down time due to maintenance. Because the low capacity factor is the result of an intermittent resource, increasing the number of wind turbines will not compensate for the low capacity factor. For this reason, the staff concluded that wind energy is not, by itself, a suitable replacement for baseload generating capacity of Peach Bottom Units 2 and 3.

8.2.5.3 Solar Power

Solar technologies use the sun's energy and light to provide heat and cooling, light, hot water, and electricity for homes, businesses, and industry. Solar power technologies, photovoltaic and thermal, cannot currently compete with conventional fossil-fueled technologies in grid-connected applications due to higher capital costs per kilowatt of capacity. The average capacity factor of photovoltaic cells is about 25 percent (NRC 1996), and the capacity factor for solar thermal systems is about 25 percent to 40 percent (NRC 1996). Energy storage requirements limit the use of solar-energy systems as baseload electricity supply.

There are substantial impacts to natural resources (wildlife habitat, land-use, and aesthetic impacts) from construction of solar-generating facilities. As stated in the GEIS, land requirements are high—14,000 ha (35,000 ac) per 1000 MW(e) for photovoltaic and approximately 5700 ha (14,000 ac) per 1000 MW(e) for solar thermal systems (NRC 1996). Neither type of solar electric system would fit at the Peach Bottom site, and both would have large environmental impacts at a greenfield site.

Recent staff inquiries to the National Renewable Energy Laboratory yielded a current average commercially available conversion efficiency of perhaps 10 percent today, with 25 percent availability, and a lower overall requirement for land (approximately 8000 ha [20,000 ac] per 1000 MW), which reduces the land requirements by about one half. However, the land requirements (160 km^2 [68 mi^2]) or rooftop space requirements (309 million m^2 [1.9 billion ft^2], which is equivalent to 46 percent of all commercial building rooftops in Pennsylvania, New York, and New Jersey combined) for the necessary solar arrays still would be large. Space requirements would be large even if the efficiency of solar panels increases substantially from today's levels. If the panels were mounted on greenfield sites rather than rooftops, the impact on ecological resources could also be substantial.

Furthermore, Exelon noted that solar power is not a technically feasible alternative in Exelon's service area for large-scale generation. Southeastern Pennsylvania receives about 3.3 kWh of solar radiation per square meter per day, compared with 5 to 7.2 kWh/m^2 per day in areas of the West, such as California, which are most promising for solar technologies (NRC 1996). Because of the area's low rate of solar radiation and high technology costs, solar power in Pennsylvania is limited to niche applications and is not a feasible base-load alternative to Peach Bottom Units 2 and 3 license renewal.

Some solar power may substitute for electric power in rooftop and building applications. Implementation of non-rooftop solar generation on a scale large enough to replace Peach Bottom Units 2 and 3 would likely result in LARGE environmental impacts.

8.2.5.4 Hydropower

Approximately 6 percent (about 2000 MW) of Pennsylvania electric generating capacity (but less than 1 percent of power production) is hydroelectric. As stated in Section 8.3.4 of the GEIS, hydropower's percentage of the country's generating capacity is expected to decline because hydroelectric facilities have become difficult to site as a result of public concern over flooding, destruction of natural habitat, and alteration of natural river courses. According to the U.S. Hydropower Resource Assessment for Pennsylvania (INEEL 1997), there are no remaining sites in Pennsylvania that would be environmentally suitable for a large hydroelectric facility.

The staff estimated in the GEIS that land requirements for hydroelectric power are approximately 400,000 ha (1 million ac or about 1600 mi^2) per 1000 MW(e). Based on this estimate, replacement of Peach Bottom Units 2 and 3 generating capacity would require flooding about 850,000 ha (3300 mi^2). This would result in a large impact on land use. Further, operation of a hydroelectric facility would alter aquatic habitats above and below the dam, which would impact existing aquatic species. Due to the relatively low amount of undeveloped hydropower resource in Pennsylvania and the large land-use and related environmental and ecological resource impacts associated with siting hydroelectric facilities large enough to replace Peach Bottom Units 2 and 3, the staff concludes that local hydropower is not a feasible alternative to Peach Bottom Units 2 and 3 OL renewal. Any attempts to site hydroelectric facilities large enough to replace Peach Bottom Units 2 and 3 would result in LARGE environmental impacts.

8.2.5.5 Geothermal Energy

Geothermal energy has an average capacity factor of 90 percent and can be used for baseload power where available. However, geothermal technology is not widely used as baseload generation due to the limited geographical availability of the resource and immature status of the technology (NRC 1996). As illustrated by Figure 8.4 in the GEIS, geothermal plants are most likely to be sited in the western continental United States, Alaska, and Hawaii where hydrothermal reservoirs are prevalent. There is no feasible eastern location for geothermal capacity to serve as an alternative to Peach Bottom Units 2 and 3. The staff concludes geothermal energy is not a feasible alternative to renewal of the Peach Bottom Units 2 and 3 OLs.

8.2.5.6 Wood Waste

A wood-burning facility can provide baseload power and operate with an average annual capacity factor of around 70 to 80 percent and with 20 to 25 percent efficiency (NRC 1996). The fuels required are variable and site-specific. A significant barrier to the use of wood waste to generate electricity is the high delivered-fuel cost and high construction cost per MW of generating capacity. The larger wood-waste power plants are only 40 to 50 MW(e) in size. Estimates in the GEIS suggest that the overall level of construction impact per MW of installed capacity should be approximately the same as that for a coal-fired plant, although facilities using wood waste for fuel would be built at smaller scales (NRC 1996). Like coal-fired plants, wood-waste plants require large areas for fuel storage and processing and involve the same type of combustion equipment.

Due to uncertainties associated with obtaining sufficient wood and wood waste to fuel a baseload generating facility, ecological impacts of large-scale timber cutting (e.g., soil erosion and loss of wildlife habitat), and high inefficiency, the staff has determined that wood waste is not a feasible alternative to renewing the Peach Bottom Units 2 and 3 OLs.

8.2.5.7 Municipal Solid Waste

Municipal waste combustors incinerate the waste and use the resultant heat to generate steam, hot water, or electricity. The combustion process can reduce the volume of waste by up to 90 percent and the weight of the waste by up to 75 percent (EPA 2001). Municipal waste combustors use three basic types of technologies: mass burn, modular, and refuse-derived fuel (DOE/EIA 2001c). Mass burning technologies are most commonly used in the United States. This group of technologies process raw municipal solid waste “as is,” with little or no sizing, shredding, or separation before combustion. Because of the need for specialized waste-separation and processing equipment for municipal solid waste, the initial capital costs for municipal solid-waste plants are greater than for comparable steam-turbine technology at wood-waste facilities (NRC 1996).

Growth in the municipal waste combustion industry slowed dramatically during the 1990s after rapid growth during the 1980s. The slower growth was due to three primary factors: (1) the Tax Reform Act of 1986, which made capital-intensive projects such as municipal waste combustion facilities more expensive relative to less capital-intensive waste disposal alternatives such as landfills; (2) the 1994 Supreme Court decision (*C&A Carbone, Inc. v. Town of Clarkstown*), which struck down local flow control ordinances that required waste to be delivered to specific municipal waste combustion facilities rather than landfills that may have had lower fees; and (3) increasingly stringent environmental regulations that increased the capital cost necessary to construct and maintain municipal waste combustion facilities (DOE/EIA 2001c).

Municipal solid waste combustors generate an ash residue that is buried in landfills. The ash residue is composed of bottom ash and fly ash. Bottom ash refers to that portion of the unburned waste that falls to the bottom of the grate or furnace. Fly ash represents the small particles that rise from the furnace during the combustion process. Fly ash is generally removed from flue-gases using fabric filters and/or scrubbers (DOE/EIA 2001c).

Currently, there are approximately 102 waste-to-energy plants operating in the United States. These plants generate approximately 2800 MW(e), or an average of approximately 28 MW(e) per plant (Integrated Waste Services Association 2001), much smaller than needed to replace the 2186 MW(e) baseload capacity of Peach Bottom Units 2 and 3. Therefore, the staff concludes that municipal solid waste would not be a feasible alternative to renewal of the Peach Bottom Units 2 and 3 OLs, particularly at the scale required.

8.2.5.8 Other Biomass-Derived Fuels

In addition to wood and municipal solid-waste fuels, there are several other concepts for fueling electric generators, including burning crops, converting crops to a liquid fuel such as ethanol, and gasifying crops (including wood waste). In the GEIS, the staff stated that none of these technologies has progressed to the point of being competitive on a large scale or of being reliable enough to replace a baseload plant such as Peach Bottom Units 2 and 3 (NRC 1996). For these reasons, such fuels do not offer a feasible alternative to renewal of the Peach Bottom Units 2 and 3 OLs.

8.2.5.9 Fuel Cells

Fuel cells work without combustion and its environmental side effects. Power is produced electrochemically by passing a hydrogen-rich fuel over an anode and air over a cathode and separating the two by an electrolyte. The only by-products are heat, water, and carbon dioxide. Hydrogen fuel can come from a variety of hydrocarbon resources by subjecting them to steam under pressure. Phosphoric acid fuel cells are the most mature fuel cell technology, but they are only in the initial stages of commercialization. Phosphoric acid fuel cells are generally considered first-generation technology. These are commercially available today at a cost of approximately $4500 per kW of installed capacity (DOE 2002). Higher-temperature second-generation fuel cells achieve higher fuel-to-electricity and thermal efficiencies. The higher temperatures contribute to improved efficiencies and give the second-generation fuel cells the capability to generate steam for cogeneration and combined-cycle operations.

DOE has a performance target that by 2003, two second-generation fuel cell technologies using molten carbonate and solid oxide technology, respectively, will be commercially available in sizes of approximately 3 MW at a cost of $1000 to $1500 per kW of installed capacity (DOE 2002). For comparison, the installed capacity cost for a natural-gas-fired combined-cycle plant is on the order of $500 to $600 per kW (NWPPC 2000). As market acceptance and

manufacturing capacity increase, natural-gas-fueled fuel cell plants in the 50- to 100-MW range are projected to become available (DOE 2002). At the present time, however, fuel cells are not economically or technologically competitive with other alternatives for baseload electricity generation. Fuels cells are, consequently, not a feasible alternative to renewal of the Peach Bottom Units 2 and 3 OLs.

8.2.5.10 Delayed Retirement

Peach Bottom Units 2 and 3 provide about 23 percent of Exelon's operating group generating capacity and approximately 35 percent of its energy requirements to its mid-Atlantic service area. Even without retiring any generating units, Exelon expects to require additional capacity in the near future. Thus, even if substantial capacity were scheduled for retirement and could be delayed, some of the delayed retirement would be needed just to meet load growth. Peach Bottom Units 2 and 3 will be required, in part, to offset any actual retirements that occur. Delayed retirement of other Exelon generating units could not provide a replacement of the power supplied by Peach Bottom Units 2 and 3 and could not be a feasible alternative to Peach Bottom Units 2 and 3 license renewal.

8.2.5.11 Utility-Sponsored Conservation

In the past, Exelon (formerly PECO) has offered the demand-side management (DSM) programs, which either conserve energy or allow PECO to reduce customers' load requirements during periods of peak demands. The programs, as described by Exelon, are:

Conservation Program

Homeowner agreements to limit peaking power in specific areas

Load Management Programs

- Change status of currently operating units to standby generation
- Curtailable service (e.g., industry agreements)
- Interruptible service (e.g., electric water heaters)

Exelon annually projects both the summer and winter peak power (MW) and annual energy requirements (gigawatt-hours [GWH]) impacts of DSM. Projections for future DSM programs represent substantial decreases in DSM initiatives that were in effect during past years.

Market and regulatory conditions are undergoing dramatic changes that have significantly impacted the cost-effectiveness of utility-sponsored DSM and can be described as follows:

(1) A decline in generation costs, due primarily to technological advances that have reduced the cost of constructing new generating units (e.g., combustion turbines); and

(2) National energy legislation that has encouraged wholesale competition through open access to the transmission grid, as well as state legislation designed to facilitate retail competition.

Consistent with (1) and (2) above, the utility planning environment features lower capacity and lower energy prices than during earlier periods, shorter planning horizons, lower reserve margins, and increased reliance on market prices to direct utility resource planning. These have greatly reduced the number of cost-effective DSM alternatives.

Other significant changes include:

- Rate design programs that enable customers to make energy choices based on their unique needs and energy costs. An example is Exelon's eight percent reduction in electricity rates and caps on future generation and transmission and distribution rates. Such rate designs will increasingly replace incentive-driven direct load-control programs.

- The adoption of increasingly stringent national appliance standards for most major energy-using equipment and the adoption of energy efficiency requirements in state building codes. These mandates have further reduced the potential for cost-effective utility-sponsored measures.

- Third parties are increasingly providing energy services and products in competitive markets at prices that reflect their value to the customer. Market conditions can be expected to continue this shift among providers of cost-effective load management.

For these reasons, Exelon determined that the remaining DSM programs, which are primarily directed toward load management, are not an effective substitute for any of its large base-load units operating at high-capacity factors, including Peach Bottom Units 2 and 3.

Deregulation and Reducing Demand

In November 1996, the General Assembly of Pennsylvania enacted the Electricity Generation Customer Choice and Competition Act. The Act would enable all customers of electric distribution companies in the Commonwealth to purchase electricity from their choice of electric generation suppliers by January 1, 2001 (General Assembly of Pennsylvania 1996). As such, electric generation supply would be based on the customers' needs and preferences, the lowest price, or the best combination of prices, services, and incentives (Pennsylvania Public Utility Commission 2000).

In response, Exelon (as PECO) submitted its restructuring plan and received final approval from the Pennsylvania Public Utility Commission. The restructuring plan allowed all customers to choose among competing power suppliers by January 1, 2000 (PECO 1998). With more than 50 suppliers licensed to sell electricity in Pennsylvania, Exelon will not be able to control demand and offering extensive conservation and load modification incentives would not be effective in a competitive market. As a result, in a deregulated market for generation of electrical power in which the market price of power is a function of supply and demand, Exelon will not be able to offer competitively priced power if it subsidizes demand reduction alternatives. Furthermore, as discussed in this section, there is limited potential to reduce loads using unsubsidized demand reduction alternatives. As a result, demand reduction is not a reasonable alternative to license renewal of Peach Bottom Units 2 and 3. The Public Utility Commission will ensure that the operation of generating units of incumbent utilities will not inhibit the development of competition within the Commonwealth. Therefore, it is not clear whether Exelon or another competitive supplier would construct new generating units to replace Peach Bottom Units 2 and 3, if its licenses were not renewed. However, regardless of the entity that constructed and operated the replacement power sources, certain environmental parameters would be constant among replacement power sources. Therefore, this DSEIS discusses the impacts of reasonable alternatives to Peach Bottom Units 2 and 3, without regard to whether they would be owned by Exelon.

The staff concludes that additional DSM, by itself, would not be sufficient to replace the 2186 MW(e) capacity of Peach Bottom Units 2 and 3 and that it is not a reasonable replacement for the OL renewal alternative.

8.2.6 Combination of Alternatives

Even though individual alternatives to Peach Bottom Units 2 and 3 might not be sufficient on their own to replace Peach Bottom Units 2 and 3 capacity due to the small size of the resource or lack of cost-effective opportunities, it is conceivable that a combination of alternatives might be cost-effective.

As discussed in Section 8.2, Peach Bottom Units 2 and 3 have a combined net summer rating of 2186 MW(e). For the coal- and natural-gas-fired alternatives, the Exelon ER assumes four standard units that generate a net 508-MW(e) apiece as potential replacements for Units 2 and 3, leaving 154 MW(e) to be supplied.

There are many possible combinations of alternatives. One combination of alternatives that might be assumed as replacements for Peach Bottom Units 2 and 3 would consist of combined cycle natural-gas-fired generation using closed-cycle cooling and additional DSM measures or purchased power. However, Sections 8.2.4 and 8.2.5.11 show that neither additional purchased power nor DSM programs are very practical large-scale alternatives under current

regulatory conditions. In addition, Table 8-8 shows that the associated environmental impacts of the combination option still would be at least as large as those of renewing the Peach Bottom Unit 2 and Unit 3 OLs. The impacts are based on the gas-fired generation impact assumptions discussed in Section 8.2.2, adjusted for the reduced generating capacity. While the DSM measures would have few environmental impacts, operation of the new gas-fired plant would result in increased emissions and environmental impacts. The environmental impacts associated with power purchased from other generators would still occur but would be located elsewhere within the region, nation, or another country as discussed in Section 8.2.4. The impacts of purchased power are not shown in Table 8-8. The staff concludes that it is very unlikely that the environmental impacts of any reasonable combination of generating and conservation options could be reduced to the level of impacts associated with renewal of the Peach Bottom Units 2 and 3 OLs.

Table 8-8. Summary of Environmental Impacts of 1060 MW(e) of Natural Gas-Fired Generation and 1126 MW(e) from Demand-Side Management Measures

Impact Category	Peach Bottom Site		Alternate Site	
	Impact	**Comments**	**Impact**	**Comments**
Land Use	SMALL to MODERATE	23 ha (55 ac) for power block, offices, roads, and parking areas. Additional impact of up to approximately 22 ha (54 ac) for construction and/or upgrade of an underground gas pipeline.	SMALL to MODERATE	23 ha (55 ac) for power-block, offices, roads, and parking areas. Approximately 259 ha (640 ac) for transmission line. Additional impact for construction and/or upgrade of an underground gas pipeline.
Ecology	SMALL	Uses previously disturbed areas at current Peach Bottom site, plus gas pipeline route.	SMALL to MODERATE	Impact depends on location and ecology of the site, surface water body used for intake and discharge, and transmission and pipeline routes; potential habitat loss and fragmentation; reduced productivity and biological diversity. Impacts to terrestrial ecology from cooling tower drift. Likely plant sites already have power generation facilities.
Water Use and Quality (Surface Water)	SMALL	Uses existing cooling canal system.	SMALL to MODERATE	Impact depends on volume of water withdrawal and discharge and characteristics of surface water body.

Table 8-8. (contd)

Impact Category	Peach Bottom Site		Alternate Site	
	Impact	**Comments**	**Impact**	**Comments**
Water Use and Quality (Groundwater)	SMALL	Use of groundwater very unlikely.	SMALL to LARGE	Impacts SMALL if used only for potable purposes; could be MODERATE to LARGE if groundwater is employed as makeup cooling water. Impacts would be site/aquifer specific.
Air Quality	MODERATE	Sulfur oxides • 56 MT/yr (62 tons/yr) Nitrogen oxides • 209 MT/yr (231 tons/yr) Carbon monoxide • 274 MT/yr (304 tons/yr) PM_{10} particulates • 31 MT/yr (35 tons/yr) Some hazardous air pollutants	MODERATE	Potentially same impacts as at the Peach Bottom site.
Waste	SMALL	Minimal waste products from fuel combustion.	SMALL	Minimal waste products from fuel combustion.
Human Health	SMALL	Impacts considered to be minor.	SMALL	Impacts considered to be minor.
Socioeconomics	SMALL to MODERATE	During construction, impacts would be MODERATE. Up to 750 additional workers during the peak of the 3-year construction period, followed by reduction from current Peach Bottom Units 2 and 3 work force of 975 to 75; tax base preserved. Impacts during operation would be SMALL.	SMALL to MODERATE	During construction, impacts would be SMALL to MODERATE. Tax impacts on receiving county could be small to MODERATE. Up to 750 additional workers during the peak of the 3-year construction period. Impacts significant if location is in a more rural area than the Peach Bottom site. York County would experience loss of tax base and employment, potentially offset by projected economic growth.

Table 8-8. (contd)

Impact Category	Peach Bottom Site		Alternate Site	
	Impact	**Comments**	**Impact**	**Comments**
	SMALL to MODERATE	Transportation impacts during operation would be SMALL due to the smaller workforce. Transportation impacts associated with construction workers would be SMALL to MODERATE.	SMALL to MODERATE	Transportation impacts associated with construction workers would be SMALL to MODERATE and would depend on population density and road infrastructure at alternate site. Impacts during operation would be SMALL due to the smaller workforce.
Aesthetics	SMALL	SMALL impact due to plant units and stacks. Visual impact would be similar to current Peach Bottom site.	SMALL to MODERATE	SMALL if previously developed site is used and site disturbance is minimal. MODERATE with construction of a transmission line to a previously developed site. MODERATE if greenfield site is developed.
Historic and Archeological Resources	SMALL	Any potential impacts can likely be effectively managed.	SMALL	Same as at the Peach Bottom site. Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL	Impacts on minority and low-income communities should be similar to those experienced by the population as a whole. Some impacts on housing may occur during construction; loss of 900 operating jobs at Peach Bottom Units 2 and 3 could reduce employment prospects for minority and low-income populations. Impacts could be offset by projected economic growth and the ability of affected workers to commute to other jobs.	SMALL to MODERATE	Impacts vary depending on population distribution and makeup at site—could be SMALL to MODERATE.

8.3 Summary of Alternatives Considered

The environmental impacts of the proposed action, renewal of the Peach Bottom Units 2 and 3 OLs, are SMALL for all impact categories (except collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal for which single significance level was not assigned). The alternative actions, i.e., no-action alternative (discussed in Section 8.1), new generation alternatives (from coal, natural gas, and nuclear discussed in Sections 8.2.1 through 8.2.3, respectively), purchased electrical power (discussed in Section 8.2.4), alternative technologies (discussed in Section 8.2.5), and the combination of alternatives (discussed in Section 8.2.6) were considered.

The no-action alternative would require replacing electrical generating capacity by (1) demand-side management and energy conservation, (2) power purchased from other electricity providers, (3) generating alternatives other than Peach Bottom Units 2 and 3, or (4) some combination of these options, and would result in decommissioning Peach Bottom Units 2 and 3. For each of the new generation alternatives (coal, natural gas, and nuclear), the environmental impacts would not be less than the impacts of license renewal. For example, the land-disturbance impacts resulting from construction of any new facility would be greater than the impacts of continued operation of Peach Bottom Units 2 and 3. The impacts of purchased electrical power would still occur, but would occur elsewhere. Alternative technologies are not considered feasible at this time and it is very unlikely that the environmental impacts of any reasonable combination of generation and conservation options could be reduced to the level of impacts associated with renewal of the OLs for Peach Bottom Units 2 and 3.

The staff concludes that the alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

8.4 References

10 CFR Part 50. Code of Federal Regulations, Title 10*, Energy,* Part 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Functions.”

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy,* Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR Part 50. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 50, “National Primary and Secondary Ambient Air Quality Standards.”

40 CFR Part 51. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans."

40 CFR Part 60. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 60, "Standards of Performance for New Stationary Sources."

40 CFR Part 81. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 81, "Designation of Areas for Air Quality Planning Purposes."

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9.0 Summary and Conclusions

By letter dated July 2, 2001, the Exelon Generation Company, LLC, (Exelon) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for Peach Bottom Units 2 and 3 for an additional 20-year period (Exelon 2001a). If the OLs are renewed, State regulatory agencies and Exelon will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, then the plant must be shut down at or before the expiration of the current OLs, which expire on August 8, 2013, for Unit 2, and July 2, 2014, for Unit 3.

Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321) directs that an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, which identifies licensing and regulatory actions that require an EIS. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).[(a)]

Upon acceptance of the Exelon application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping (67 FR 44832, EPA 2002). The staff visited the Peach Bottom site in November 2001, and held public scoping meetings on November 7, 2001, in Delta, Pennsylvania (NRC 2002). The staff reviewed the Exelon Environmental Report (ER; Exelon 2001b) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the *Standard Review Plan for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff also considered the public comments received during the scoping process for preparation of the Supplemental Environmental Impact Statement (SEIS) for Peach Bottom Units 2 and 3. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part I, of this SEIS.

The staff held two public meetings in Delta, Pennsylvania in July 2002, to describe the preliminary results of the NRC environmental review and to answer questions to provide members of the public with information to assist them in formulating their comments. All of the

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

comments received on the draft SEIS were considered by the staff in developing the final document and are presented in Appendix A.

The SEIS includes the NRC staff's analysis in which the staff considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse effects. It also includes the staff's recommendation regarding the proposed action.

The NRC has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

> ... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OL.

NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b).[(a)]

(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations-generic determination of no significant environmental impact."

The GEIS contains the results of a systematic evaluation of the consequences of renewing an OL and operating a nuclear power plant for an additional 20 years. In the GEIS, the NRC evaluated 92 environmental issues using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

> SMALL - Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
>
> LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS shows the following:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste [HLW] and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must also be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the OLs for Peach Bottom Units 2 and 3) and alternative methods of power generation. These alternatives are evaluated assuming that the replacement power generation plant is located at either the Peach Bottom site or some other unspecified location.

9.1 Environmental Impacts of the Proposed Action — License Renewal

Exelon and the NRC staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither Exelon nor the staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither Exelon nor the staff has identified any new issue applicable to Peach Bottom Units 2 and 3 that has a significant environmental impact. These determinations include the considerations of public comments. Therefore, the staff relies upon the conclusions of the GEIS for all Category 1 issues that are applicable to Peach Bottom Units 2 and 3.

Exelon's license renewal application presents an analysis of the Category 2 issues that are applicable to Peach Bottom Units 2 and 3 plus environmental justice and chronic effects from electromagnetic fields. The staff has reviewed the Exelon analysis for each issue and has conducted an independent review of each issue. Three Category 2 issues are not applicable because they are related to plant design features or site characteristics not found at Peach Bottom. Four Category 2 issues are not discussed in this SEIS because they are specifically related to refurbishment. Exelon (Exelon 2001b) has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of Peach Bottom Units 2 and 3 for the license renewal period. In addition, any replacement of components or additional inspection activities are within the bounds of normal plant component replacement and, therefore, are not expected to affect the environment outside of the bounds of the plant operations evaluated in the *Final Environmental Statement Related to Operation of Peach Bottom Atomic Power Station Units Nos. 2 and 3* (AEC 1973).

Thirteen Category 2 issues related to operational impacts and one related to postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this SEIS. Five of the Category 2 issues and environmental justice apply to both refurbishment and to operation during the renewal term and are only discussed in this SEIS in relation to operation during the renewal term. For all 14 Category 2 issues and environmental justice, the staff concludes that the potential

environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs. Based on its review of the SAMAs for Peach Bottom Units 2 and 3, and the plant improvements already made, the staff concludes that none of the candidate SAMAs are cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate the environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction have been avoided, have been mitigated, or have already occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

The adverse impacts of continued operation identified are considered to be of SMALL significance, and none warrants implementation of additional mitigation measures. The adverse impacts of likely alternatives if Peach Bottom Units 2 and 3 ceases operation at or before the expiration of the current OLs will not be smaller than those associated with continued operation of these units, and they may be greater for some impact categories in some locations.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of Peach Bottom Units 2 and 3 during the current license periods was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance and operation, the nuclear fuel used by the reactors, and ultimately, permanent offsite storage space for the spent fuel assemblies.

The most significant resource commitments related to operation during the renewal term are the fuel and the permanent storage space. Peach Bottom Units 2 and 3 replace approximately one third of the fuel assemblies in each of the two units during every refueling outage, which occurs on a 24-month cycle.

The likely power generation alternatives if Peach Bottom Units 2 and 3 cease operation on or before the expiration of the current OLs will require a commitment of resources for construction of the replacement plants as well as for fuel to run the plants.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between short-term use and long-term productivity of the environment at the Peach Bottom site was set when the plants were approved and construction began. That balance is now well established. Renewal of the OLs for Peach Bottom Units 2 and 3 and continued operation of the plant will not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the OLs will lead to shutdown of the plant and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the Peach Bottom site into a park or an industrial facility are quite different.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the OLs for Peach Bottom Units 2 and 3. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. As noted in Chapter 3, no refurbishment and no refurbishment impacts are expected at Peach Bottom Units 2 and 3. Chapters 4 through 7 discuss environmental issues associated with renewal of the OLs. Environmental issues associated with the no-action alternative and alternatives involving power generation and use reduction are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the OLs), the no-action alternative (denial of the application), alternatives involving nuclear or coal- or gas-fired generation of power at the Peach Bottom site and an unspecified “greenfield site,” and a combination of alternatives are compared in Table 9-1. Continued use of a once-through cooling system for Peach Bottom Units 2 and 3 is assumed for Table 9-1.

Table 9-1 shows that the significance of the environmental effects of the proposed action are SMALL for all impact categories (except for collective offsite radiological impacts from the fuel

cycle and from HLW and spent fuel disposal, for which a single significance level was not assigned [see Chapter 6]). The alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation

Option	Impact Category	Land Use	Ecology	Water Use and Quality	Air Quality	Waste
Proposed Action	License Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
No-Action Alternative	Denial of Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
Coal-Fired Generation	Alternate Site	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	MODERATE	MODERATE
	Alternate Site using Closed-Cycle Cooling	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	MODERATE	MODERATE
Natural Gas-Fired Generation	Peach Bottom Site	SMALL to MODERATE	SMALL	SMALL	MODERATE	SMALL
	Alternate Site	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL
	Alternate Site using Closed-Cycle Cooling	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL
New Nuclear Generation	Peach Bottom Site	MODERATE	MODERATE	SMALL	SMALL	SMALL
	Alternate Site	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	SMALL	SMALL
	Alternate Site using Closed-Cycle Cooling	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	SMALL	SMALL
Combination of Alternatives	Peach Bottom Site	SMALL to MODERATE	SMALL	SMALL	MODERATE	SMALL
	Alternate Site	SMALL to MODERATE	SMALL to MODERATE	SMALL to LARGE	MODERATE	SMALL

Table 9-1 (contd)

Option	Impact Category	Human Health[(a)]	Socioeconomics	Aesthetics	Historic and Archeological Resources	Environmental Justice
Proposed Action	License Renewal	SMALL	SMALL	SMALL	SMALL	SMALL
No-Action Alternative	Denial of Renewal	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
Coal-Fired Generation	Alternate Site	SMALL	SMALL to LARGE	MODERATE	SMALL	SMALL to MODERATE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to LARGE	MODERATE	SMALL	SMALL to MODERATE
Natural Gas-Fired Generation	Peach Bottom Site	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
	Alternate Site	SMALL	SMALL to MODERATE	MODERATE	SMALL	SMALL to MODERATE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to MODERATE	MODERATE	SMALL	SMALL to MODERATE
New Nuclear Generation	Peach Bottom Site	SMALL	SMALL to LARGE	SMALL to MODERATE	SMALL	SMALL to MODERATE
	Alternate Site	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL	SMALL to LARGE
	Alternate Site using Closed-Cycle Cooling	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL	SMALL to LARGE
Combination of Alternatives	Peach Bottom Site	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL
	Alternate Site	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL to MODERATE

(a) Except for collective offsite radiological impacts from the fuel cycle and from HLW and spent-fuel disposal, for which single significance levels were not assigned. See Chapter 6 for details.

9.3 Staff Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS (NRC 1996; 1999), (2) the ER submitted by Exelon (Exelon 2001b), (3) consultation with Federal, State, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments, the staff recommends that the Commission determine that the adverse environmental impacts of license

renewal for Peach Bottom Units 2 and 3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

9.4 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

Exelon Generation Company, LLC (Exelon). 2001a. Application for Renewed Operating Licenses, Peach Bottom Units 2 and 3. Kennett Square, Pennsylvania.

Exelon Generation Company, LLC (Exelon). 2001b. *Applicant's Environmental Report - Operating License Renewal Stage Peach Bottom Units 2 and 3*. Kennett Square, Pennsylvania.

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U.S. Nuclear Regulatory Commission (NRC). 2000. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal.* NUREG-1555, Supplement 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2001. "Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process." *Federal Register*: Vol. 66, No. 185, pp. 48892-48893. September 24, 2001.

U.S. Nuclear Regulatory Commission (NRC). 2002. *Environmental Impact Statement Scoping Process: Summary Report – Peach Bottom Units 2 and 3, Peach Bottom, Pennsylvania*. Washington, D.C.

Appendix A

Comments Received on the Environmental Review

Appendix A

Comments Received on the Environmental Review

Part I - Comments Received During Scoping

On September 24, 2001, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent in the Federal Register (66 FR 48892), to notify the public of the staff's intent to prepare a plant-specific supplement to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, Volumes 1 and 2, to support the renewal application for the Peach Bottom operating licenses and to conduct scoping. This plant-specific supplement to the GEIS has been prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) guidelines, and 10 CFR Part 51. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. The NRC invited the applicant; Federal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at scheduled public meetings and/or submitting written suggestions and comments no later than November 26, 2001.

The scoping process included two public scoping meetings, which were held at the Peach Bottom Inn in Delta, Pennsylvania on November 7, 2001. Approximately 70 members of the public attended the meetings. Each session began with NRC staff members providing brief overviews of the license renewal process and the NEPA process. After the NRC's prepared statements, the meetings were opened for public comments. Twenty-one attendees provided either oral statements that were recorded and transcribed by a certified court reporter or written statements. The meeting transcripts are an attachment to the Peach Bottom Public Meeting Summary Report dated January 18, 2002. The Public Electronic Reading Room (ADAMS) accession number for the summary report is ML020180346. (This accession number is provided to facilitate access to the document through ADAMS at http://www.nrc.gov/reading-rm.html) In addition to the comments provided during the public meetings, six comment letters, six e-mail messages, and two documents were received by the NRC in response to the Notice of Intent.

At the conclusion of the scoping period, the NRC staff and its contractors reviewed the transcripts and all written material received to identify specific comments and issues. Each set of comments from an individual was given a unique identifier (Commenter ID), so that the comments could be traced back to the original transcript, letter, or e-mail containing the comment. Specific comments were numbered sequentially within each comment set. Several commenters submitted more than one set of comments (e.g., they made statements in both the afternoon and evening scoping meetings). In these cases, there is a unique Commenter ID for each set of comments.

Appendix A

Table A.1 identifies the individuals who provided comments applicable to the environmental review and gives the Commenter ID associated with each set of comments. Individuals who spoke at the scoping meetings are listed in the order in which they spoke at the public meeting, and individuals who provided comments by letter or e-mail are listed in alphabetical order. To maintain consistency with the scoping summary report, (Peach Bottom Environmental Scoping Summary Report, dated April 19, 2002), the unique identifier used in that report for each set of comments is retained in this appendix.

Table A.1. Individuals Providing Comments During Scoping Comment Period

Commenters ID	Commenter	Affiliation (If Stated)	Comment Source
PBS-A	Christopher Reilly	York County	Afternoon Scoping Meeting
PBS-B	Kay Carman	York County	Afternoon Scoping Meeting
PBS-C	Jay Doering	Exelon	Afternoon Scoping Meeting
PBS-D	Fred Polaski	Exelon	Afternoon Scoping Meeting
PBS-E	Salvatore Ferranti		Afternoon Scoping Meeting
PBS-F	Bill Doward	Sheetmetal Workers Union Local 19	Afternoon Scoping Meeting
PBS-G	John Tucker		Afternoon Scoping Meeting
PBS-H	Terry Peck	Plumbers and Pipefitters Union Local 520	Afternoon Scoping Meeting
PBS-I	William Faraly, Jr.	Sheetmetal Workers Union Local 19	Afternoon Scoping Meeting
PBS-J	Sam McConnell		Evening Scoping Meeting
PBS-K	Jay Doering	Exelon	Evening Scoping Meeting
PBS-L	Fred Polaski	Exelon	Evening Scoping Meeting
PBS-M	Mike Ewall		Evening Scoping Meeting
PBS-N	Tracy Confer		Evening Scoping Meeting
PBS-O	Kip Adams		Evening Scoping Meeting
PBS-P	Ernie Guyll		Evening Scoping Meeting
PBS-Q	Richard King		Evening Scoping Meeting
PBS-R	Laura Jacobson		Evening Scoping Meeting
PBS-S	Jane Lee		Evening Scoping Meeting
PBS-T	Mary Osborn		Evening Scoping Meeting
PBS-U	William Coble		Evening Scoping Meeting
PBS-V	Jeff Griffith		Evening Scoping Meeting
PBS-W	Amy Donohue		Evening Scoping Meeting
PBS-X	George Crocker	North American Water Office	Email - Letter ML020110480)
PBS-Y	Dr. Lewis Cuthbert	The Alliance for a Clean Environment	Faxed Letter (ML020020383)
PBS-Z	Amy Donohue		Letter (ML013460258)
PBS-AA	Mike Ewall	Energy Justice Network	Flyer (ML020170483)

Table A.1. (contd)

Commenters ID	Commenter	Affiliation (If Stated)	Comment Source
PBS-AB	Thomas H. Gehr		Email – Letter ML020230264
PBS-AC	Dr. Jay M. Gould	Radiation and Public Health Project	Email (ML020230268)
PBS-AD	David P. Harry		Email – Letter (ML020310096)
PBS-AE	Hugh Jackson	Public Citizen, Policy Analyst	Email – Letter (ML020310088)
PBS-AF	Hugh Jackson	Public Citizen, Policy Analyst	Email – Letter (ML020310088)
PBS-AG	Richard L. McLean	Maryland Department of Natural Resources	Letter (ML020230262)
PBS-AH	Christopher Reilly	York County	Letter (ML020170484)
PBS-AI	Ken Zieber		Email (ML020230260)
PBS-AJ	Thomas E. Donley	York County Chamber of Commerce	Letter (ML013650052)
PBS-AK	Daniel R. Griffith	Delaware State Historic Preservation Officer	Letter (ML013650064)

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by the commenters. The comments fall into one of several general groups. These groups include

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 or Category 2 issues or issues that were not addressed in the GEIS. They also address alternatives and related federal actions.

- General comments (1) in support of or opposed to nuclear power or license renewal or (2) on the license renewal process, the NRC's regulations, and the regulatory process. These comments may or may not be specifically related to the Peach Bottom license renewal application.

- Questions that do not provide new information.

- Specific comments that address issues that do not fall the within or are specifically excluded from the purview of NRC environmental regulations. These comments typically address issues such as the need for power, emergency preparedness, current operational safety issues, and safety issues related to operation during the renewal period.

Each comment applicable to this environmental review and the NRC staff responses are summarized in this appendix. This information, was extracted from the Peach Bottom Environmental Scoping Summary Report, and is provided for the convenience of those interested in the scoping comments applicable to this environmental review. The comments that are general or outside the scope of the environmental review for Peach Bottom are not included here. More detail regarding the disposition of general or nonapplicable comments can be found in the Environmental Summary Report.

The following pages summarize the comments and suggestions received as part of the scoping process that are applicable to this environmental review, and discuss the disposition of the comments and suggestions. The parenthetical alpha-numeric identifier after each comment refers to the comment set (Commenter ID) and the comment number.

Comments in this section are grouped in the following categories:

(1) Comments Concerning Category 1 Human Health Issues
(2) Comments Concerning Category 2 Socioeconomic Issues
(3) Comments Concerning Category 2 Aquatic Ecology Issues
(4) Comments Concerning Alternatives
(5) Comments Concerning Category 1 Postulated Accident Issues

Appendix A

Comments

1. Comments Concerning Category 1 Human Health Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 human health issues include:

- Radiation exposure to the public during refurbishment
- Occupational radiation exposure during refurbishment
- Microbiological organisms (occupational health)
- Noise
- Radiation exposures to public (license renewal term)
- Occupational radiation exposures (license renewal term)

Comment: We are also finding higher incidents of thyroid and breast cancers in nuclear reactor communities, including in the tri-county area around here. (PBS-M-9)

Comment: I would submit that an environmental impact statement ought to include human population as part of the scope. (PBS-N-1)

Comment: I would also suggest that since Peach Bottom is so close to Limerick, Three Mile Island, and not terribly far from Salem, that the impacts of Peach Bottom should be considered in conjunction with the cumulative impacts of all those three reactors combined. I would even extend that as far as a 100-mile radius for my own comfort. (PBS-N-2)

Comment: Some of the numbers that they have compiled indicate that thyroid cancer increased considerably after Units 2 and 3 started operation. The number they came up with is that it increased 49 percent. (PBS-N-3)

Comment: In short, I would like to submit that the scope should include non-cancer health effects in the human population, that it should include cumulative impacts from other reactors over a 100-mile radius. (PBS-N-4)

Comment: My father died of cancer about 16 years ago and he lived a very healthy lifestyle, I believe. He had smoked but he stopped about 23 years before he died. The only unhealthy thing he might have done is, he spent a lot of time outside. (PBS-P-2)

Comment: And one thing I would like as far as the environmental study is to know the number of those radioactive releases and how much radiation was released. (PBS-P-4)

Comment: I would also like as part of the environmental study data on the cancer deaths, birth defects and stillbirths in a 10-mile radius of the Peach Bottom Power plant and how that compares with the national average. (PBS-P-5)

Comment: I would like to know the type of radioactive isotopes at the plant and the half-life of those isotopes. (PBS-P-7)

Comment: Something even more troubling is the release of tritium and tritium is a nuclide generated out of the process of nuclear power plants. Tritium is part water and it cannot be filtered and therefore, it goes into the river. Down river anybody who is drinking that water is drinking tritiated water. (PBS-S-1)

Comment: The steam that is released into the atmosphere is also tritiated so that when it drifts downwind from where you live, you are inhaling tritium. (PBS-S-2)

Comment: We have learned that cancer deaths near the Peach Bottom plant rose in Lancaster and York Counties after Units 2 and 3 began operations.

- Increases were noted in radiation-sensitive cancers, including leukemia, breast, thyroid, bone and joint, Hodgkin's disease, and multiple myeloma.

- The number of women diagnosed with breast cancer in Chester, Lancaster, and York Counties nearly doubled between 1985 and 1998.

- Thyroid cancer in the three counties jumped from 26 to 110 between 1985 and 1998. The current rate is 28% above the rate for the U.S. Thyroid cancer is considered one of the more radiation-sensitive cancers. (PBS-Y-1)

Comment: Peach Bottom is obviously an enormous health risk to over a million residents in that region. In fact, Pottstown, an area already hard-hit by high rates of diseases like cancer, is located about 45-50 miles northeast (downwind from Peach Bottom).

- Pottstown residents ingests airborne particles (either breathed or from the local municipal water) routinely escaping from Peach Bottom.

- The Pottstown area gets much of its milk from dairies located in Lancaster and York Counties, near Peach Bottom. Residents, both near Peach Bottom and elsewhere like Pottstown, ingest Peach Bottom fallout in milk. (PBS-Y-3)

Comment: The EIS on Peach Bottom should require a brutally honest look at radiation and its effects on everything around it -- air, water, soil, humans, and other animals, plants, insects -- over the millions of years for which it remains hazardous. (PBS-Z-8)

Comment: Plutonium is biologically and chemically attracted to bone. It clumps on the surface of the bone, delivering a concentrated dose of radiation to surrounding cells. Radioactive strontium lodges in bone and remains there for a lifetime, constantly irradiating the surrounding cells. (PBS-Z-9)

Comment: It's pretty common knowledge that radiation causes cancer and death. What isn't common knowledge is the other effects it can have on the human population, which we may already be experiencing without seeing the connection to radiation. R. M. Sievert, famous radiologist, told an international meeting in 1950, "There is no known tolerance for radiation." Death by slow poison is as unacceptable as death by catastrophic accident. There is no safe exposure to ionizing radiation. (PBS-Z-10)

Comment: Fission products may be called 'background radiation' when they do not emanate from the installation under consideration, or when they have been in the environment for a year or more. Thus, when two nuclear power plants on the same land are licensed separately (such as Peach Bottom), the pollution from one is considered 'background radiation' while contamination from the other is being considered. Plus, last year's pollution from the reactor becomes 'background' after persisting in the environment longer than a year. An individual's yearly radiation exposure estimate attributable to nuclear activities is an assessment of a fresh fission dose from a particular source -- not a realistic measure of total dose from all sources, whether external -- left over from last year's pollution or already incorporated into body tissue from previous ingested or inhaled radionuclides, continuing to give small doses of radiation all the time. It is also misleading to report pollution in terms of a percentage increase in 'background radiation' levels. Little or nothing is said about the steady increase in background radiation due to human activities. Hence, a percentage of 'background radiation' added may stay constant, masking the total accumulation. (PBS-Z-12)

Comment: Government regulations allow radioactive water to be released into the environment, containing "permissable" levels of contamination. "Permissable" does not mean safe. (PBS-Z-17)

Comment: Do operations of reactors, which routinely emit man-made chemicals into the air that are inhaled and ingested in diet, result in increased disease risk, including cancer? (PBS-AC-1)

Comment: Overall, the local cancer rate jumped from 3% below the U.S. rate to 2% above. This may appear to be a small increase, but in the 10-year period 1975-84, over 600 additional cancer deaths occurred in Lancaster and York Counties. Perhaps most telling about the NCI data is that rates for almost all cancers most sensitive to the damaging effects of radiation increased. For example, humans exposed to radiation from nuclear reactors have an increased risk of thyroid cancer, due to the presence of thyroid-damaging iodine in reactor emissions. Thyroid cancer deaths were 14% below the U.S. before 1975, but jumped to 28% above after the reactors opened. The same occurred for bone and joint cancer, and multiple myeloma (bone marrow cancer), sensitive to bone-seeking radioactive chemicals such as strontium and barium (see below). The local breast cancer death rate increased significantly. A final indicator that Peach Bottom releases contributed to unusually high cancer rates was the rise in cancer deaths among children under age 10 living in Lancaster and York counties. Children are most susceptible to diseases caused by environmental pollutants such as nuclear power plant emissions. (PBS-AC-11)

Comment: In 1985, the Pennsylvania Health Department began to collect cancer cases (as opposed to deaths) for the first time. Their files are complete throughout 1998. During that period, the total number of cancer cases rose 48%, from 4280 to 6313. During the same period, the number of new breast cancer cases diagnosed in women nearly doubled, from 609 to 1135. Over half of this increase took place in the most recent four years (1994-98), making the issue a current one (see below). The number of thyroid cancer cases jumped from 26 to 110 from 1985 to 1998 (see below). Again, the large increase from 1994 to 1998 (72 to 110) makes thyroid cancer a present concern. (PBS-AC-12)

Comment: Current (1998) local rates of all cancers, breast cancer, and thyroid cancer exceed the U.S. average, by 7.3%, 19.9%, and 28.3%, respectively. (PBS-AC-13)

Response: The comments are noted. To the extent that these comments question the radiological protection afforded by NRC regulations, radiation doses to the public during the license renewal term are a Category 1 issue as evaluated in the GEIS. Doses to members of the public from Peach Bottom Units 2 and 3 emissions were specifically evaluated in Section 4.6 of the GEIS, using data from monitored emissions and ambient monitoring, and were found to be well within regulatory limits. The evaluation of health effects of radiation, both natural and man-made, is an ongoing activity involving public, private, and international institutions. The assessment of health effects upon which the GEIS analysis is based was founded on the consensus of these sources. No changes in that consensus have occurred since the GEIS was completed. The comments will not be evaluated further.

Comment: Now, in human health aspects we need to include the current research on things like a strontium-90 disposition in baby teeth like the Tooth Fairy Project folks have been doing. (PBS-M-7)

Comment: I know the government stopped looking at that, on the strontium-90 impacts in the milk supply and in humans after many years. But the amount that is being found in this private research recently is as high as was found in the atmospheric bomb testing in the '40's and 50's. And so this is definitely something that needs to be included in the environmental impact statement as well as looking at other epidemiological studies on things like infant mortality where they are finding infant mortality dropping in communities around nuclear reactors after they have closed. (PBS-M-8)

Comment: Health Studies Are Lacking. There has been a dearth of scientific, peer-reviewed studies evaluating disease rates near U.S. nuclear power plants since the first reactor began operations in 1957. Only one national study has been done. In 1990, at the insistence of Senator Edward M. Kennedy, the National Cancer Institute published data on cancer near nuclear plants. While the study concluded that there was no connection between radioactive emissions and cancer deaths, rates near many reactors rose after reactor startup. Since 1990, no federal agency, including the Environmental Protection Agency and Nuclear Regulatory Commission, has undertaken any studies of disease rates near nuclear plants. (PBS-AC-5)

Comment: In-Body Measurements Are Lacking. The lack of health studies near American nuclear reactors is complemented by a lack of measurements of in-body levels of radioactivity for persons living near nuclear reactors. Government-supported programs to measure Strontium-90 in St. Louis baby teeth (4) and in New York City and San Francisco bones (5) were terminated in 1970 and 1982, respectively. Both measured the effects of bomb test fallout rather than nuclear power reactor emissions. (PBS-AC-6)

Comment: Of all man-made radioactive chemicals, Sr-90 was the one that caused the greatest health concern during the atmospheric bomb test years in the 1950s and 1960s. (PBS-AC-7)

Comment: Link Between Sr-90 in Teeth and Childhood Cancer -- Long Island. The largest number of teeth (563) have been measured for residents of Suffolk County New York, site of the Brookhaven National Lab and surrounded by nearby reactors. Results show that the average level of Sr-90 has steadily increased 40.0% from the early 1980s to the mid-1990s. Because U.S. above-ground bomb testing ceased in the early 1960s, and old bomb fallout is decaying steadily, this trend indicates that a current source of radioactive emissions is contributing to the buildup of Sr-90 in teeth. This source can only be nuclear reactors. During the same time period, the rate of cancer diagnosed in Suffolk County children less than 10 years old steadily rose a nearly identical 48.9% (10). The data support the theory that exposure to radioactivity increases the risk of cancer, especially in young persons. (PBS-AC-8)

Comment: Strontium-90 in Baby Teeth. While the majority of teeth have been received from California, Florida, New Jersey, and New York, 33 are from children born after 1979 in southeastern Pennsylvania or in Maryland. (After 1979, virtually all strontium-90 in baby teeth was generated from nuclear reactors, rather than atomic bomb test fallout left over from the early 1960s). The average Sr-90 concentration in these teeth is higher than any of the four states with large numbers of teeth (CA, FL, NJ, and NY), and more than 60% greater than the national average. Virtually all of these 33 teeth are from persons living within 55 miles of Peach Bottom. (PBS-AC-10)

Comment: These developments indicate that efforts to protect humans from the potentially harmful effects of exposure to radioactive emissions in the environment will be critical. (PBS-AC-15)

Response: The comments are noted. The staff considers the interest in Sr-90 in baby teeth to be within the scope of this license renewal environmental review, and will discuss the results of its assessment of the issue for the Peach Bottom license renewal in Chapter 4 of the SEIS.

2. Comments Concerning Category 2 Socioeconomic Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 socioeconomic issues are:

- Housing
- Public services: public utilities
- Public services, education (refurbishment)
- Offsite land use (refurbishment)

- Offsite land use (license renewal term)
- Public services, transportation
- Historic and archaeological resources.

Comment: The plant provides hundreds of local and regional residents good-paying jobs. (PBS-A-1)

Comment: For example, the county-affiliated Delta Senior Center has received thousands of dollars in money and equipment from Exelon during my tenure as commissioner. (PBS-A-2)

Comment: The county, school district and host municipality also derive significant tax revenue from the plant. (PBS-A-3)

Comment: By extending Peach Bottom Atomic Power Station's operating license, the NRC will help ensure at least two more decades of growth, opportunity and prosperity in York County. (PBS-A-5)

Comment: It means jobs for approximately 1000 people over that period of time. (PBS-C-5)

Comment: It means a positive impact on the local economy, as covered by Chris: taxes and services, plant employees and their families living in the area. (PBS-C-6)

Comment: It means support of the community. We get very much involved in community activities around the plant. Mason-Dixon Business Association, the Delta Peach Bottom Elementary School. We have a program going there called School Buddies where employees from the power plant team up with the teachers at the school and visit the school on a regular basis to talk to the students -- a very successful program not only for the students but I would say for the employees also. It really builds morale. (PBS-C-7)

Comment: Thousands of dollars are contributed to the United Way by our employees at Peach Bottom. Hundreds of pints of blood go to the American Red Cross each year. There's little league coaches. There's PTA presidents. There's a lot of volunteer firemen. There's a lot of church leaders, all coming out of Peach Bottom. And that's an impact that we have on the plan. (PBS-C-8)

Comment: And one of the reasons that my business is so successful is because of the business that Excelon or PECO brings into our community. Throughout the years, PECO has created a significant growth for my business because we cater their seminars, their training classes, their meetings. (PBS-E-1)

Comment: And most of all, directly into this community PECO is creating an influx of people into the area from subcontractors, and there are even their own employees. And these people spend in the community. (PBS-E-2)

Comment: Just like my business, I'm sure that other businesses, from local supermarkets and gas stations and other businesses in the community live in a great deal because of PECO. (PBS-E-3)

Comment: We cannot afford a big company like PECO to leave our community. (PBS-E-4)
Comment: And third of all, PECO has also maintained great parks into our community. It donates to our fire department. It also donates to our local ambulance groups. (PBS-E-7)

Comment: I am proud of this community and I realize that PECO is probably one of the economic hearts of our community. It's an asset to our community. (PBS-E-9)
Comment: Most of the 371 members I have spoken about live in the York and Lancaster areas, more importantly depend on the safe and good-paying jobs that support their families and this community. (PBS-F-1)

Comment: The Peach Bottom Power Plant has been a good economic factor with regard to construction and maintenance. (PBS-H-2)

Comment: Wherever you go throughout this state or throughout the region, that this corporation has been -- they have always been based in the community, have helped the community, and they have always been support of the community and in essence part of the community. And although there are certain corporate profits that you go after because of being a business, you know, you can't take a side of those other aspects where they have been involved in the community. (PBS-I-4)

Comment: We have a good working relationship with Exelon PECO as far as them donating money to the community for the fire company. (PBS-V-1)

Comment: Just as critical, however, is the importance of Peach Bottom Atomic Power Station to York County. The plant provides hundreds of local and regional residents with good-paying jobs. But more importantly, Peach Bottom is an outstanding corporate citizen and neighbor. (PBS-AH-3)

Comment: The York County Chamber of Commerce represents 2200 members who have directly or indirectly benefited from having the Peach Bottom Nuclear Power Plant operating in our county. We have confidence that Exelon Corp. will continue to invest in the facility and operate it with the highest safety standards. (PBS-AJ-3)

Response: The comments are noted. Socioeconomic issues specific to the plant are Category 2 issues and will be addressed in Chapter 4 of the SEIS. The comments support license renewal at PBAPS.

Comment: It is our opinion the relicensing of this facility, without some mitigation measures being employed to preserve and protect this historic property, will result in the continued deterioration of the portion of the Feeder Canal which was bisected by the transmission line (36 CFR 800.(5)(b)(vi)). We suggest these mitigation measures should include: 1) the

restoration of the depth and width of the Feeder Canal across the transmission line; 2) the construction of a simple bridge to permit vehicular access across the Feeder Canal for routine transmission line Right-of-Way maintenance; and 3) monitoring of the transmission line Right-of-Way to prevent uncontrolled crossing of the Feeder Canal by dirt bikes and ATVs and the repair of damage resulting from such uncontrolled crossing, if they do occur. (PBS-AK-1)
Response: The comment is noted. Issues concerning historic and archeological resources are Category 2 issues and will be addressed in Chapter 4 of the SEIS.

Comment: Peach Bottom Nuclear Power Plant is located in a relatively low income, rural community without much political clout. This is environmental injustice. (PBS-Z-29)

Response: The comment is noted. Environmental Justice will be addressed in Section 4.4 of the SEIS.

3. Comments Concerning Category 2 Aquatic Ecology Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 aquatic ecology issues are:

- Entrainment of fish and shellfish in early life stages
- Impingement of fish and shellfish
- Heat shock

Comment: We request that within the scope of the NRC's Environmental Assessment, as a Category 2 issue, the NRC conduct a thorough evaluation of the potential impact of license renewal for PBAPS on the restoration of migratory fishes to the Susquehanna River and Cheasapeake Bay utilizing all relevant and current information. (PBS-AG-1)

Response: The comment is noted. The comment relates to aquatic ecology issues and will be discussed in Chapters 2 and 4 of the SEIS.

Comment: Have studies been conducted or will they be conducted to quantify the cumulative radioactive buildup in the Susquehanna River water, bed, or local area surface soil or aquifer? And additionally, if those studies have been made, have projections been made as to the extended plant life, what that will do to it, based on those studies? (PBS-J-1)

Comment: I think you said you do study the effect of the wildlife in the Susquehanna River. It would be nice to have a study before the plant was built so we could have some sort of benchmark for that. (PBS-P-6)

Response: The comments are noted. The comments relate to cumulative impact issues and will be discussed in Chapters 2 and 4 of the SEIS.

4. Comments Concerning Alternatives

Comment: I would much rather see Peach Bottom continue to operate rather than other viable alternatives for electric power generation which are more polluting and actually more difficult to control the pollution. (PBS-J-5)

Comment: Now, as for alternatives, I understand the EIS would be looking at alternatives to having nuclear generation in the first place. And I strongly encourage that. I think this needs to look at not only other forms of generation but other forms of demand management needs to look at conservation efficiency, needs to look at the studies and supply some written testimony. (PBS-M-14)

Comment: We also need to look at things like wind generation. (PBS-M-16)

Comment: We also need to look at solar generation where KPMG, which is an international -- it is a very well-known auditing firm -- has actually done a report looking at what it would take to make solar power affordable, what it would take to get to the point where we don't have this trouble where people aren't willing to pay so much for it and that's why it is not cheap enough because they don't make enough of it. (PBS-M-17)

Comment: And it should include alternative generation sources as in: What is the impact of keeping this reactor operational as opposed to, oh, say, building a bunch of wind turbines? (PBS-N-5)

Comment: And I also believe that we should use renewable resources for energy and if necessary replace the Peach Bottom Power Plant, to shut it down and implement a decommissioning process. (PBS-P-12)

Comment: There are alternative methods available to these companies that will produce power for the needs of our communities and for those outside of our area who also need power. (PBS-Q-4)

Comment: So there surely must be a better way to generate electricity without slowly killing not just the human population or not just the animal population. (PBS-S-5)

Comment: You certainly find another way generate electricity besides poisoning the population, destroying the land, destroying the animals, destroying the fish, destroying the drinking water. (PBS-S-7)

Comment: For these reasons, I think we need to begin to look for alternate ways to make electricity and take this weapon out of the hands of our enemies. (PBS-U-4)

Comment: If the real, honest reason for nuclear power is to create electricity, there are smarter, cleaner, safer and cheaper ways. (PBS-Z-33)

Comment: Just imagine if we spent the money we currently spend mining uranium, splitting the atoms to make plutonium to create heat, to boil water to turn turbines making electricity and then cleaning up and storing the resulting radioactive wastes for millions of years -- if we took this money and instead used it for conservation, solar and wind, we'd probably still have some left over and no nuclear waste to worry about. Any other decision seems just plain stupid. (PBS-Z-34)

Comment: Rather than further pillage our environment for more dirty power, we can start today with policies which promote conservation, efficiency and CLEAN renewables (like wind and solar) to replace our dirty and wasteful power system. (PBS-AA-1)

Comment: Conservation and efficiency have a large potential to reduce our electricity needs. (PBS-AA-2)

Comment: Solar power, if it were only affordable, has the power to fill the entire country's energy needs -- using existing rooftops and other already paved surfaces. (PBS-AA-3)

Comment: Wind power, according to the U.S. Department of Energy, can provide more power than the entire nation's electricity needs. (PBS-AA-4)

Comment: Alternative sources of energy need to be developed and the goal should be to strive to that end by 2014, and/or build more hydro-electric plants rather than renew a contract at an aging nuclear facility. (PBS-AB-2)

Comment: Specifically, in the Peach Bottom supplemental EIS, the NRC should conduct a comprehensive analysis addressing costs and environmental impacts of available conservation technologies. Further, the NRC should sincerely and honestly consider the potential of those technologies and energy efficiencies as the preferred alternative to license renewal. (PBS-AE-4)

Response: The comments are noted. Impacts from reasonable alternatives for the Peach Bottom license renewal will be evaluated in Section 8 of the SEIS.

5. Comments Concerning Category 1 Postulated Accident Issues

As stated in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, design basis accidents is the only Category 1 issue associated with postulated accidents. For severe accidents (i.e., beyond design basis accidents), the staff concluded that the probability-weighted environmental consequences from severe accidents are small for all plants, but that alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. See 10 CFR 51.53(c)(3)(ii)(L).

Comment: There has been a lot of work done on these containments, but Mark 1 containments, especially being smaller with lower design pressure and in spite of the suppression pool, if you look at the WASH-1400 reg safety study you will find something like a 90-percent probability of that containment failing. (PBS-M-12)

Comment: Now, there have been some measures to address those concerns that NRC had. But we are still looking at the fact that the control room operators would have to make a decision in the case of an emergency core cooling system activation on whether or not to vent the containment in order to save it. And that is not something that should be seen as acceptable impact on the environment. (PBS-M-13)

Comment: Another concern I have with the Peach Bottom Power Plant is the possibility of an earthquake causing a problem. And I know a lot of people kind of think that might be funny. But there is a fault line called the Martick Fault Line that runs about, I would say, less than 10 miles north of here. And if there is a major earthquake along that line, that could cause a lot of problems. (PBS-P-3)

Comment: Martick Fault Line. [see comment PBS-P-3] (PBS-Q-3)

Comment: According to a report by Sandia National Laboratories on November 1, 1982, called Calculation of Reactor Accident Consequences (CRAC-2), the "peak early deaths" from an accident at Peach Bottom are estimated at 72,000, with "peak early injuries" estimated at 45,000. (PBS-Y-2)

Comment: Pottstown would also be strongly affected by escaping downwind radiation in case of an accident at Peach Bottom caused by operators. If prevailing winds blow at about 10 miles per hour, harmful radiation would arrive in Pottstown in as little as 5 hours after the accident. (PBS-Y-4)

Comment: Peach Bottom is a General Electric Boiling water reactor, an obsolete design that is no longer built or constructed, inferior to pressure water reactors. Peach Bottom's Mark I containment structure has been demonstrated by Sandia Laboratories to be likely to fail during a core melt accident (like Three Mile Island), allowing radiation to escape directly into the environment. This was corroborated by a February 1987 NRC study. Industry officials say the problem with Mark I is that it is too small and wasn't designed to withstand the pressure it is supposed to resist. In Feb. 1989, the NRC recommended plants using the Mark I shell to modify the structure to reduce the risk of failure during an accident. Clearly showing its arrogance and lack of concern for the safety and health of workers and citizens, PECO said it would only make the $2-5 million changes if forced to do so. (PBS-Z-15)

Comment: Accidental releases from either the containment vessel or the waste storage area would be devastating to local health. High levels of radioactivity would quickly enter the atmosphere and be inhaled by local residents. These poisonous chemicals would later be brought to earth by precipitation, and enter the water and food supply for months and years to come, as some chemicals decay more slowly than others. Estimates of casualties after a nuclear accident were made by Sandia National Laboratories in New Mexico shortly after the partial core meltdown at Three Mile Island in 1979. These estimates were presented as the Calculation of Reactor Accident Consequences (CRAC-2) report presented to Congress on November 1, 1982. CRAC-2 estimates an accident at Peach Bottom would cause 72,000 "peak early deaths" and 45,000 "peak early injuries" soon after it occurs. These figures should be

seen as a minimal estimate of the health risk of such an accident. (PBS-AC-14)

Response: The comments are noted. Severe accidents, including events initiated by earthquakes, were evaluated in the GEIS and the impacts were determined to be small for all plants. A site-specific analysis of Severe Accident Mitigation Alternatives for Peach Bottom will be performed by the NRC staff within this environmental analysis. The comments provide no new information and will not be evaluated further in the context of the environmental review.

Part II - Comments Received on the Draft SEIS

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Peach Bottom Atomic Power Station, Units 2 and 3, Draft Report for Comment* (NUREG-1437, Supplement 10, referred to as the draft SEIS) to Federal, State, and local government agencies; certain Indian tribes; and as well as interested members of the public. As part of the process to solicit public comments on the draft SEIS, the staff:

- placed a copy of the draft SEIS into the NRC's electronic Public Document Room, its license renewal website, at the Whiteford Library in Harford County, Maryland, the Collinsville Community Library in Brogue, Pennsylvania, and the Quarryville Library in Quarryville, Pennsylvania.

- sent copies of the draft SEIS to the applicant, members of the public who requested copies, representatives of certain Indian tribes, and certain Federal, State, and local agencies

- published a notice of availability of the draft SEIS in the Federal Register on July 1, 2002 (67 FR 44245)

- issued public announcements, such as advertisements in local newspapers and postings in public places, of the availability of the draft SEIS

- announced and held two public meetings in Delta, Pennsylvania on July 30, 2002, to describe the results of the environmental review and answer related questions

- issued public service announcements and press releases announcing the issuance of the draft SEIS, the public meetings, and instructions on how to comment on the draft SEIS|

- established a website to receive comments on the draft SEIS through the Internet.

During the comment period, the staff received a total of 8 comment letters in addition to the comments received during the public meetings.

The staff has reviewed the public meeting transcripts and the 8 comment letters that are part of the docket file for the application, all of which are available in the NRC's electronic Public Document Room. Appendix A, Part II, Section A.1 contains a summary of the comments and the staff's responses. Related issues are grouped together. Appendix A, Part II, Section A.2 contains excerpts of the July 30, 2002, public meeting transcripts, the written statements provided at the public meetings, and comment letters.

Each comment identified by the staff was assigned a specific alpha-numeric identifier (marker). That identifier is typed in the margin of the transcript or letter at the beginning of the discussion of the comment. A cross-reference of the alpha-numeric identifiers, the speaker or author of the comment, the page where the comment can be found, and the section(s) of this report in which the comment is addressed is provided in Table A-2. The speakers at the meetings are listed in speaking order along with the page of the transcript excerpts in this report on which the comment appears. These comments are identified by the letters "PBD" followed by a number that identifies each comment in approximate chronological order in which the comments were made. The written statements (from the public meetings) and written comment letters are also identified by the letters "PBD."

The staff made a determination on each comment that it was one of the following:

(1) a comment that was actually a request for information and introduced no new information.

(2) a comment that was either related to support or opposition of license renewal in general (or specifically Peach Bottom Atomic Power Station, Units 2 and 3) or that made a general statement about the license renewal process. It may have made only a general statement regarding Category 1 and/or Category 2 issues. In addition, it provided no new information and does not pertain to 10 CFR Part 54.

(3) comment about a Category 1 issue
    (a) that provided new information that required evaluation during the review, or
    (b) provided no new information

(4) a comment about a Category 2 issue that
    (a) provided information that required evaluation during the review, or
    (b) provided no such information

(5) a comment that raised an environmental issue that was not addressed in the GEIS or the DSEIS

(6) a comment on safety issues pertaining to 10 CFR Part 54, or

(7) a comment outside the scope of license renewal (not related to 10 CFR Parts 51 or 54).

There was no significant new information provided on Category 1 issues [(3)(a) above] or information that required further evaluation on Category 2 issues [(4)(a)]. Therefore, the GEIS and draft SEIS remained valid and bounding, and no further evaluation was performed.

Comments without a supporting technical basis or without any new information are discussed in this appendix, and not in other sections of this report. Relevant references that address the issues within the regulatory authority of the NRC are provided where appropriate. Many of these references can be obtained from the NRC Electronic Public Document Room.

Within each section of Part II of this appendix (A.1.1 through A.1.21), similar comments are grouped together for ease of reference, and a summary description of the comments is given, followed by the staff's response. Where the comment or question resulted in a change in the text of the draft report, the corresponding response refers the reader to the appropriate section of this report where the change was made. Revisions to the text in the draft report are designated by vertical lines beside the text.

Some numbers were initially assigned to portions of verbal or written statements that were later determined not to be comments. These items were removed from the table. As a result, not all numbers are sequential (see Table A-2).

Table A-2. Peach Bottom, Units 2 and 3 SEIS Comment Log

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD01-1	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-68	A.1.19
PBD01-2	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD01-4	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-50	A.1.13
PBD01-5	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-50	A.1.13
PBD01-6	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-50	A.1.13
PBD01-7	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-68	A.1.19
PBD01-8	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD01-9	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD01-10	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD01-11	P. Gunter	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD02-1	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD02-2	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-27	A.1.1
PBD02-3	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.3
PBD02-4	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD02-5	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD02-6	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD02-7	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-27	A.1.1

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD02-8	F. Berryhill	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.3
PBD03-1	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-32	A.1.7
PBD03-2	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-63	A.1.18
PBD03-3	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD03-4	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD03-5	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD03-6	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD03-7	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-41	A.1.10
PBD03-8	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-41	A.1.10
PBD03-9	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-29	A.1.5
PBD03-10	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD03-11	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-41	A.1.10
PBD03-12	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD03-13	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-68	A.1.19
PBD03-14	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD03-16	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD03-17	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.1
PBD03-18	S. Smith	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD03-19	S. Smith	Evening Meeting Transcript (07/30/02)	A-50	A.1.13
PBD03-20	S. Smith	Evening Meeting Transcript (07/30/02)	A-43	A.1.10
PBD04-1	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-32	A.1.7
PBD04-2	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.3
PBD04-3	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD04-4	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD04-5	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-44	A.1.10
PBD04-7	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD04-8	S.C. Washburn	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD05-1	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD05-2	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-45	A.1.10
PBD05-3	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-40	A.1.10
PBD05-4	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-63	A.1.18
PBD05-5	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.3
PBD05-6	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD05-7	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD05-8	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-44	A.1.10
PBD05-9	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD05-10	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD05-11	J. Johnsrud	Afternoon Meeting Transcript (07/30/02)	A-31	A.1.5
PBD06-1	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-44	A.1.10
PBD06-2	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD06-3	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD06-4	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD06-5	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-38	A.1.10
PBD06-6	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD06-7	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD06-8	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD06-9	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-43	A.1.10
PBD06-11	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD06-12	J. Mangano	Afternoon Meeting Transcript (07/30/02)	A-52	A.1.13
PBD07-1	A. Nelson	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.2
PBD07-2	A. Nelson	Afternoon Meeting Transcript (07/30/02)	A-34	A.1.8
PBD07-3	A. Nelson	Afternoon Meeting Transcript (07/30/02)	A-34	A.1.8
PBD07-4	A. Nelson	Afternoon Meeting Transcript (07/30/02)	A-46	A.1.11
PBD07-5	A. Nelson	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD08-1	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-39	A.1.10
PBD08-3	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-43	A.1.10
PBD08-4	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-66	A.1.19
PBD08-5	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD08-6	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-69	A.1.19
PBD08-7	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-45	A.1.10
PBD08-8	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-46	A.1.10
PBD08-9	M. Marks	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD09-1	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD09-2	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD09-3	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD09-4	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD09-5	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD09-6	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.1
PBD09-7	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.1
PBD09-8	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-48	A.1.12
PBD09-9	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD09-10	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-38	A.1.10
PBD09-11	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-38	A.1.5
PBD09-12	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-45	A.1.10
PBD09-13	D. Cuthbert	Afternoon Meeting Transcript (07/30/02)	A-30	A.1.5
PBD10-1	S. McConnell	Afternoon Meeting Transcript (07/30/02)	A-29	A.1.4
PBD10-2	S. McConnell	Afternoon Meeting Transcript (07/30/02)	A-66	A.1.18
PBD10-3	S. McConnell	Afternoon Meeting Transcript (07/30/02)	A-29	A.1.4
PBD10-4	S. McConnell	Afternoon Meeting Transcript (07/30/02)	A-29	A.1.4
PBD10-5	S. McConnell	Afternoon Meeting Transcript (07/30/02)	A-29	A.1.4
PBD11-1	L. Egbert	Afternoon Meeting Transcript (07/30/02)	A-49	A.1.12
PBD11-2	L. Egbert	Afternoon Meeting Transcript (07/30/02)	A-49	A.1.12
PBD11-3	L. Egbert	Afternoon Meeting Transcript (07/30/02)	A-49	A.1.12
PBD11-4	L. Egbert	Afternoon Meeting Transcript (07/30/02)	A-49	A.1.5
PBD12-1	B. August	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD12-2	B. August	Afternoon Meeting Transcript (07/30/02)	A-68	A.1.19
PBD12-3	B. August	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD12-4	B. August	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD12-5	B. August	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD12-6	B. August	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD12-7	B. August	Afternoon Meeting Transcript (07/30/02)	A-68	A.1.19
PBD12-8	B. August	Afternoon Meeting Transcript (07/30/02)	A-28	A.1.3
PBD12-9	B. August	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD13-1	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-62	A.1.18
PBD13-2	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD13-3	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD13-4	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD13-5	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19
PBD13-6	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-70	A.1.19

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD13-7	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-67	A.1.19
PBD13-9	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-62	A.1.18
PBD13-10	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-62	A.1.18
PBD13-11	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-62	A.1.18
PBD13-12	A. Donohue	Afternoon Meeting Transcript (07/30/02)	A-40	A.1.10
PBD14-1	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-51	A.1.13
PBD14-2	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-52	A.1.13
PBD14-3	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-48	A.1.12
PBD14-4	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD14-5	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD14-6	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-48	A.1.12
PBD14-7	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-47	A.1.12
PBD14-8	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-52	A.1.13
PBD14-9	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-31	A.1.5
PBD14-10	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD14-11	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD14-12	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-72	A.1.19
PBD14-13	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-72	A.1.19
PBD14-14	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-72	A.1.19
PBD14-15	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-63	A.1.18
PBD14-16	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-64	A.1.18
PBD14-17	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-64	A.1.18
PBD14-18	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-64	A.1.18
PBD14-19	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-64	A.1.18
PBD14-20	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-65	A.1.18
PBD14-21	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-65	A.1.18
PBD14-22	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-65	A.1.18
PBD14-23	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-72	A.1.19
PBD14-24	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-66	A.1.18
PBD14-25	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD14-26	M. Ewall	Afternoon Meeting Transcript (07/30/02)	A-71	A.1.19
PBD15-1	N. Wurzbach	Evening Meeting Transcript (07/30/02)	A-28	A.1.4
PBD15-2	N. Wurzbach	Evening Meeting Transcript (07/30/02)	A-28	A.1.4

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD15-3	N. Wurzbach	Evening Meeting Transcript (07/30/02)	A-29	A.1.4
PBD16-1	E. Guyll	Evening Meeting Transcript (07/30/02)	A-67	A.1.19
PBD16-2	E. Guyll	Evening Meeting Transcript (07/30/02)	A-66	A.1.19
PBD16-3	E. Guyll	Evening Meeting Transcript (07/30/02)	A-47	A.1.12
PBD16-4	E. Guyll	Evening Meeting Transcript (07/30/02)	A-66	A.1.19
PBD16-5	E. Guyll	Evening Meeting Transcript (07/30/02)	A-66	A.1.19
PBD16-6	E. Guyll	Evening Meeting Transcript (07/30/02)	A-30	A.1.5
PBD16-7	E. Guyll	Evening Meeting Transcript (07/30/02)	A-50	A.1.13
PBD16-8	E. Guyll	Evening Meeting Transcript (07/30/02)	A-50	A.1.13
PBD16-9	E. Guyll	Evening Meeting Transcript (07/30/02)	A-50	A.1.13
PBD16-10	E. Guyll	Evening Meeting Transcript (07/30/02)	A-38	A.1.10
PBD16-11	E. Guyll	Evening Meeting Transcript (07/30/02)	A-43	A.1.10
PBD16-12	E. Guyll	Evening Meeting Transcript (07/30/02)	A-63	A.1.18
PBD16-13	E. Guyll	Evening Meeting Transcript (07/30/02)	A-30	A.1.5
PBD17-1	S. Liebman	Evening Meeting Transcript (07/30/02)	A-29	A.1.4
PBD17-2	S. Liebman	Evening Meeting Transcript (07/30/02)	A-29	A.1.4
PBD17-3	S. Liebman	Evening Meeting Transcript (07/30/02)	A-48	A.1.2
PBD17-4	S. Liebman	Evening Meeting Transcript (07/30/02)	A-29	A.1.4
PBD17-5	S. Liebman	July 13, 2002, Letter	A-48	A.1.2
PBD17-6	S. Liebman	July 13, 2002, Letter	A-75	A.1.20
PBD17-7	S. Liebman	July 13, 2002, Letter	A-29	A.1.4
PBD18-1	M. Gallagher	August 27, 2002, Letter	A-72	A.1.20
PBD18-2	M. Gallagher	August 27, 2002, Letter	A-72	A.1.20
PBD18-3	M. Gallagher	August 27, 2002, Letter	A-72	A.1.20
PBD18-4	M. Gallagher	August 27, 2002, Letter	A-72	A.1.20
PBD18-5	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-6	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-7	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-8	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-9	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-10	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-11	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-12	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD18-13	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-14	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-15	M. Gallagher	August 27, 2002, Letter	A-73	A.1.20
PBD18-16	M. Gallagher	August 27, 2002, Letter	A-57	A.1.16
PBD18-17	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-18	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-19	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-20	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-21	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-22	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-23	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-24	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-25	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-26	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-27	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-28	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-29	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-30	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD18-31	M. Gallagher	August 27, 2002, Letter	A-74	A.1.20
PBD19-1	D. Griffith	September 9, 2002, Letter	A-57	A.1.16
PBD19-2	D. Griffith	September 9, 2002, Letter	A-58	A.1.16
PBD19-3	D. Griffith	September 9, 2002, Letter	A-58	A.1.16
PBD19-4	D. Griffith	September 9, 2002, Letter	A-58	A.1.16
PBD19-5	D. Griffith	September 9, 2002, Letter	A-60	A.1.16
PBD19-6	D. Griffith	September 9, 2002, Letter	A-61	A.1.16
PBD20-1	R. McLean	September 13, 2002, Letter	A-53	A.1.14
PBD20-2	R. McLean	September 13, 2002, Letter	A-53	A.1.14
PBD21-1	M. Chezik	September 13, 2002, Letter	A-33	A.1.7
PBD21-2	M. Chezik	September 13, 2002, Letter	A-54	A.1.14
PBD21-3	M. Chezik	September 13, 2002, Letter	A-54	A.1.14
PBD21-4	M. Chezik	September 13, 2002, Letter	A-54	A.1.14
PBD21-5	M. Chezik	September 13, 2002, Letter	A-54	A.1.14
PBD21-6	M. Chezik	September 13, 2002, Letter	A-61	A.1.17

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD21-7	M. Chezik	September 13, 2002, Letter	A-31	A.1.7
PBD21-8	M. Chezik	September 13, 2002, Letter	A-36	A.1.9
PBD21-9	M. Chezik	September 13, 2002, Letter	A-36	A.1.9
PBD21-10	M. Chezik	September 13, 2002, Letter	A-37	A.1.9
PBD21-11	M. Chezik	September 13, 2002, Letter	A-35	A.1.9
PBD21-12	M. Chezik	September 13, 2002, Letter	A-37	A.1.9
PBD21-13	M. Chezik	September 13, 2002, Letter	A-37	A.1.9
PBD21-14	M. Chezik	September 13, 2002, Letter	A-37	A.1.9
PBD21-15	M. Chezik	September 13, 2002, Letter	A-34	A.1.9
PBD21-16	M. Chezik	September 13, 2002, Letter	A-33	A.1.7
PBD21-17	M. Chezik	September 13, 2002, Letter	A-33	A.1.7
PBD21-18	M. Chezik	September 13, 2002, Letter	A-35	A.1.9
PBD21-19	M. Chezik	September 13, 2002, Letter	A-35	A.1.9
PBD21-20	M. Chezik	September 13, 2002, Letter	A-53	A.1.14
PBD21-21	M. Chezik	September 13, 2002, Letter	A-55	A.1.14
PBD21-22	M. Chezik	September 13, 2002, Letter	A-55	A.1.14
PBD21-23	M. Chezik	September 13, 2002, Letter	A-54	A.1.14
PBD21-24	M. Chezik	September 13, 2002, Letter	A-61	A.1.17
PBD21-25	M. Chezik	September 13, 2002, Letter	A-55	A.1.14
PBD21-26	M. Chezik	September 13, 2002, Letter	A-38	A.1.9
PBD21-27	M. Chezik	September 13, 2002, Letter	A-36	A.1.9
PBD21-28	M. Chezik	September 13, 2002, Letter	A-37	A.1.9
PBD21-29	M. Chezik	September 13, 2002, Letter	A-34	A.1.7
PBD21-30	M. Chezik	September 13, 2002, Letter	A-35	A.1.9
PBD21-31	M. Chezik	September 13, 2002, Letter	A-53	A.1.14
PBD21-32	M. Chezik	September 13, 2002, Letter	A-56	A.1.14
PBD22-1	W. Hoffman	September 17, 2002, Letter	A-75	A.1.20
PBD22-2	W. Hoffman	September 17, 2002, Letter	A-67	A.1.19
PBD22-3	W. Hoffman	September 17, 2002, Letter	A-75	A.1.20
PBD22-4	W. Hoffman	September 17, 2002, Letter	A-31	A.1.6
PBD22-5	W. Hoffman	September 17, 2002, Letter	A-46	A.1.10
PBD22-6	W. Hoffman	September 17, 2002, Letter	A-31	A.1.6
PBD22-7	W. Hoffman	September 17, 2002, Letter	A-53	A.1.14

Table A-2. (contd)

	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
PBD22-8	W. Hoffman	September 17, 2002, Letter	A-57	A.1.15
PBD23-1	Anonymous	August 8, 2002, Letter	A-27	A.1.1
PBD23-2	Anonymous	August 8, 2002, Letter	A-27	A.1.1
PBD23-3	Anonymous	August 8, 2002, Letter	A-27	A.1.1
PBD23-4	Anonymous	August 8, 2002, Letter	A-27	A.1.1
PBD23-5	Anonymous	August 8, 2002, Letter	A-31	A.1.5
PBD23-6	Anonymous	August 8, 2002, Letter	A-27	A.1.1
PBD23-8	Anonymous	August 8, 2002, Letter	A-27	A.1.1

A.1 Comments and Responses

A.1.1 General Comments in Opposition to Nuclear Power

Comment: As a matter of fact, having any new, having no nuclear power plants to work with, the NRC's willingness to keep their jobs going, with the same disregard for safety concerns, and concerns by opponents, is quite clear. (PBD02-2)

Comment: When will this country find its sanity? Its sanity. What are we doing to this planet? Plutonium is radioactive for 250,000 years, and some elements like iodine and tecnetium won't decay for millions of years. (PBD02-7)

Comment: When there's a disaster and millions die then will you stop the insanity of nuclear energy? (PBD23-1)

Comment: Only to build nuclear bombs with the old waste products do you use nuclear power? (PBD23-2)

Comment: Why not do something safe. You are accountable not me for that death trap. (PBD23-3)

Comment: I will seek out safe alternatives. (PBD23-4)

Comment: Be forewarned. You are accountable for your device. I am stopping all nuclear energy plants now. (PBD23-6)

Comment: When will your nightmare end? (PBD23-8)

Response: *The comments are noted. They are in opposition to nuclear power and are general in nature. They provide no new information and will not be evaluated further.*

A.1.2 General Comments in Support of the License Renewal Process

Comment: Moreover there is a growing recognition among the public and policy makers, both in the United states, and internationally, that we must maintain the clean air and other environmental benefits of nuclear energy. (PBD07-1)

Response: *The comment is noted. The comment is supportive of license renewal and its processes, and are general in nature. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.3 General Comments in Opposition of the License Renewal Process

Comment: The idea that technocrats, bureaucrats can sit down and degrade human liberty and freedom to an insurance risk assessment is totally bizarre. (PBD12-8)

Comment: I think it is time to stop, and maybe I will be here another 10 or 15 years. (PBD02-8)

Comment: Has anyone, from the inception of the nuclear reactors or bombs, given any thought to what would happen seven generations in the future. (PBD04-2)

Comment: There is not a word about protection of the public health and safety, or of the quality of the environment. You have to read down several sections and, even then, those factors which are surely the paramount objective in our society, are subordinated by being equated with national security and the free enterprise factor. (PBD05-5)

Comment: Most licenses do not expire for another 15 to 20 years. So I ask myself why now? The present license hasn't expired, and they have already applied. Don't you want to know why? To amortize the plant's debt further, further into the future. (PBD02-3)

Response: *The comments are noted. The comments oppose license renewal and its processes, and do not provide new information. These comments are not within the scope of 10 CFR Part 51 for the environmental review associated with the application for license renewal at Peach Bottom Atomic Power Station, Units 2 and 3. Therefore, these comments will not be evaluated further.*

A.1.4 General Comments in Support of License Renewal at Peach Bottom Atomic Power Station, Units 2 and 3

Comment: I have no problem with it, and I think it should be extended for another 20 years, because it is an attribute to the whole neighborhood, because a lot of people in the area do work at Peach Bottom, also. (PBD15-1)

Comment: As long as it keeps our electric rates down I think it is a good move, because it doesn't use fuel oil, it doesn't use gas. (PBD15-2)

Comment: So it keeps things cheaper, and we are importing too much oil right now, and that would be one of the alternatives, I think, and that is not good. (PBD15-3)

Comment: As of today I'm personally in favor of approval of the application, as a local, for the following reasons. Extending the license will be less of a local health, welfare, and safety impact than constructing a new plant, either nuclear, or fossil fuel. (PBD10-1)

Comment: The fourth reason is because Peach Bottom has been a good neighbor. I've heard questions about release of information. I have news for you, we knew about the operators sleeping, as soon as it happened. (PBD10-3)

Comment: In summary, because I live here, in the real world today, and know that another plant will fill the void less by Peach Bottom shutting down, I'm in favor of the licensing extension as more desirable than new construction of more nuclear reactors, or a fossil fuel facility, that would take their place in this void (PBD10-4)

Comment: I've done the DOE studies, and we generate 17 percent more power than we can use in Pennsylvania, and we are doing it for people who don't live here. So we are getting the emissions that would have to come from a fossil fuel plant, right here, with no benefits. (PBD10-5)

Comment: The draft report, that we've just heard about, and we are here to discuss, prepared for this renewal of the specific nuclear plant, addressed all required regulatory issues in a clear and comprehensive manner. (PBD17-1)

Comment: I believe that the stated plans given in the draft provide for the highest level of safety and efficiency that is reasonable, that reflect the concerns, and the expertise of those directly responsible for the management and operations of the Peach Bottom plant. (PBD17-2)

Comment: So as local residents, and concerned citizens, our family strongly supports the proposed NRC actions. (PBD17-4)

Comment: In summary, the draft document is a fully informative, clear outline of the intended license renewal of Units 2 & 3 at Peach Bottom. All regulatory and citizens' requirements for safe, efficient operation are presented to meet or exceed the needed levels. It is excellent an public documentation in support of a successful renewal process. (PBD17-7)

Response: *The comments are noted. The comments are supportive of license renewal at Peach Bottom Atomic Power Station, Units 2 and 3, and are general in nature. The comments provide no new information; therefore, the comments will not be evaluated further.*

A.1.5 General Comments in Opposition of License Renewal at Peach Bottom Atomic Power Station, Units 2 and 3

Comment: Pennsylvania also has, is the second highest number of nuclear reactors, and is the second highest amount of nuclear waste. Because of this Washington says we have to have a

nuclear dumping site. Pennsylvania doesn't want a nuclear dumping site, so why do we have this reactor going off, why are we creating more nuclear waste. (PBD03-9)

Comment: Please, please value the health and the environment. Please deny Exelon's application to extend Peach Bottom's license. (PBD09-13)

Comment: Closing Peach Bottom is clearly in the best interest of the health and safety of all residents in this region, and the best economic interest of the public, in general. (PBD09-2)

Comment: It is my opinion that the NRC had already decided to renew the license of the Peach Bottom power plant when they received the application. The only reason meetings are held is to meet a requirement. (PBD16-6)

Comment: Since the Peach Bottom plant is located on the edge of the great east coast megalopolis, an accident could have a devastating effect on millions of people. We need to shut down and decommission the Peach Bottom atomic power plant before a horrible accident occurs. (PBD16-13)

Comment: And I just beg you, I will tell you this, I will give you the shirt off my back, I will give you everything I own, to shut this plant down. I would stand here and allow you to take my life because I love all people so much. Shut it down. (PBD04-7)

Comment: Please shut this place down, let us begin to bear this burden and figure a way out of it. (PBD04-8)

Comment: So in conclusion I would highly recommend that no decision be made, by the NRC, to extend the license of this plant until a much more thorough assessment of environmental health threats are made. (PBD06-11)

Comment: Based on Peach Bottom's threat to human health and safety, as well as long-lasting destruction of our environment, we urge the Nuclear Regulatory Commission to deny the license renewal for Peach Bottom. (PBD09-1)

Comment: Is it true that the NRC called Peach Bottom one of the worse plants in the nation, and shut down Peach Bottom 1 in 1987? Do you think people are more efficient today? (PBD08-5)

Comment: Until such time as the government can promise to protect present and future generations, Peach Bottom should not have its license renewed. (PBD08-9)

Comment: I urge, really a total reworking of this EIS, of the environmental review necessary. (PBD05-10)

Comment: And I would strongly, strongly urge the NRC to set a precedent of denying a license extension. (PBD05-11)

Comment: The no-action alternative in here I think is the best alternative and ought to be adopted, of course. (PBD14-9)

Comment: You people are crazy to keep that kind of plant in operation. (PBD23-5)

Response: *The comments are noted. The comments oppose license renewal at Peach Bottom Atomic Power Station, Units 2 and 3, and do not provide new information. These comments are not within the scope of 10 CFR Part 51 for the environmental review associated with the application for license renewal at Peach Bottom Atomic Power Station, Units 2 and 3. Therefore, these comments will not be evaluated further in the SEIS.*

A.1.6 Comments Concerning Surface Water Quality, Hydrology, and Use Issues

Comment: Section 2.2.3 – Are there any storm water control measures or requirements that are considered in water quality or resource issues. (PBD22-4)

Response: *Section 2.2.3 of the SEIS includes requirements applicable to storm water outfalls. Part C of the Peach Bottom site's NPDES permit (PA0009733) referenced in Section 2.2.3 describes the prohibition of non-storm water discharges and spills; the requirement to prepare a Preparedness Prevention and Contingency (PPC) Plan; and requirements for storm water sampling and reporting. The current NPDES permit expires in 2005. Any additional requirements can be addressed when the permit is renewed. Because the information identified in the comment was already included in the analysis, there was no need to change the SEIS text.*

Comment: Section 4.1.1 – Water Use Conflicts – Are drought conditions incorporated into water use conflict planning. Minimum monthly average flows are discussed but not discrete significant events or worse case conditions. (PBD22-6)

Response: *Minimum monthly average flows are used in the analysis of water use conflicts because they are more representative of the overall environmental impacts of the Peach Bottom facility. The Susquehanna River Basin Commission (SRBC) is the governing body that regulates withdrawals and diversions from the Susquehanna River under Resolution Numbers 93-04, 91-02, and 83-04 referenced in Section 2.2.2. The SRBC would regulate discrete significant events or worse case conditions. Accordingly, there was no need to change the SEIS text.*

A.1.7 Comments Concerning Category 1 Aquatic Resources Issues

Comment: A thorough review should be made on the effects of various levels of radiation exposure on fish and wildlife resources and their habitats. Such exposure may result from

leakage, accident (e.g., Three Mile Island, Chernobyl) or disposal. [We suspect that the risk of radiation exposure over time may increase, despite planned maintenance as plants age.] (PBD21-7)

Response: *The NRC has not established radiation exposure standards for fish and wildlife because it is assumed that radiation guidelines which are protective of the public also provide adequate protection to plants and animals. The validity of this assumption has been upheld by national and international bodies that have examined the issue, including the National Council on Radiation Protection and Measurement (NCRP Report No. 109, Effects of Ionizing Radiation on Aquatic Organisms, 1991), the International Atomic Energy Agency (IAEA Technical Report Series No. 332, Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards, 1992), and the International Commission on Radiological Protection (ICRP Publication 26, 1977). In all of these cases, it has been emphasized that individuals of non-human species may be adversely affected by such radiation levels, but effects at the population level are not detectable. The comment contained no new information and will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: I'm concerned, I know some people that have lived here all their life, and they have fished here all their life. And starting in the '80s they've noticed carp in this area that are one-eyed, have strange fins, are different, they don't fight much to be caught. And I'm under the impression; I don't fish or anything but this is not common for carp. (PBD03-1)

Comment: But ten years ago my family, we decided not to take any fish, or partake of any fish out of the lake, because we noticed ten years ago that sores and abnormalities on fish in the lake. (PBD04-1)

Response: *The NRC staff contacted Dr. Dilip Mathur, Vice President and Technical Director for Normandeau Environmental Consultants at the Muddy Run Ecological Laboratory in Drumore, Pennsylvania. Normandeau Environmental Consultants started sampling in Conowingo Pond in 1966 and continued until about 1988. Normandeau conducted additional sampling from 1995 to 2000. Normandeau estimates that over a million fish (of 56 species) have been collected from Conowingo Pond and examined. In addition, they have observed over 20 million fish in the fish lifts. In the earlier sampling period, Normandeau staff was on the Pond nearly every day of each year. Most of this time was associated with the Peach Bottom Units 2 and 3 technical specifications. In addition, Normandeau staff were involved with examining impingement samples at the intake screens and would make observations of the condition of fish.*

Dr. Mathur stated that the type of abnormality described for carp has not been observed over the years of sampling by trawl, trap nets seines, and general observations of fish in Conowingo Pond. He further stated that this includes the most recent sampling in calendar year 2000. The Normandeau staff also monitors the fish lifts at the two upstream dams, Holtwood and Safe Harbor, and have not reported any occurrences of deformities in fish collected there. The only

deformity noted by the fisheries staff is, on rare occasions, a channel catfish afflicted with scoliosis (bent back), a situation commonly seen in catfish farming and related to the environment of Conowingo Pond. A letter in response to this issue is included in Appendix C. In addition, losses from predation, parasitism, and disease among organisms exposed to sublethal stresses is a Category 1 issue in the GEIS. Absent significant information regarding this issue, the staff considers the conclusions in the GEIS to be appropriate for Peach Bottom Units 2 and 3. The was no change to the SEIS text.

Comment: We also recommend that ichthyoplankton be considered with aquatic resources. (PBD21-16)

Response: *In the GEIS, the staff concluded, "Entrainment of phytoplankton and zooplankton has not been found to be a problem at operating nuclear power plants and is not expected to be a problem during the license renewal term." Additionally, the staff has reviewed the available information and based on the results of entrainment studies and the operating history of the Peach Bottom Units 2 and 3 intake structure, concludes that the potential impacts of entrainment of fish and shellfish in the early life stages (ichthyoplankton) in the cooling water intake system are SMALL. See SEIS Section 4.1.2. During the course of the SEIS preparation, the staff considered mitigation measures for the continued operation of Peach Bottom Units 2 and 3. When continued operation for an additional 20 years is considered as a whole, all of the specific effects on the environment (whether or not "significant") were considered. Based on its assessment, the staff expects that the measures in place at Peach Bottom Units 2 and 3 (e.g., intake screens and the waste heat treatment facility) provide mitigation for all impacts related to entrainment and no new mitigation measures are warranted. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: We recommend the inclusion of "thermal release" in final Supplement 10 as a "source of potential or known impact." One of the reported negative effects of thermal discharges is increased incidence of disease and parasites in fish attracted to the plume. (PBD21-1)

Response: *Impacts resulting from the thermal release is considered in the assessment of potential impacts for continued operation of Peach Bottom. In addition, losses from predation, parasitism, and disease among organisms exposed to sublethal stress is a Category 1 issue in the GEIS. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: One question that should be evaluated is the cumulative impact of impingement and entrainment on finfish or other aquatic life in the Conowingo Pool area. To answer this question, NRC or Exelon would first need to know the losses from all water intakes in the water body; the finfish population size, dynamics, exploitation, structure, etc; and how the impingement/

entrainment losses are partitioned among the various intakes. This information is useful for determining where, when, and under what conditions entrainment and/or impingement losses cause an observable effect on fish populations or other aquatic life. This question will be difficult to answer without sufficient advanced preparation, however. (PBD21-17)

Comment: Require an assessment of cumulative impacts of all projects from all water intakes in the Conowingo Pool area, including finfish population size, dynamics, exploitation, and structure, and the partitioning of impingement/entrainment losses among the various intakes. (PBD21-29)

Response: *As set forth in the SEIS, the staff has evaluated the impacts on the environment which are likely to result from incremental impact of the continued operation of Peach Bottom Units 2 and 3 for an additional 20 years when added to other past, present and foreseeable future actions. The staff did not specifically note all the intakes on Conowingo Pond; however, the aquatic populations of the Pond are sufficiently stable such that the staff concluded that potential impacts are small and no further mitigation of Peach Bottom Units 2 and 3 operations are needed. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

A.1.8 Comments Concerning Category 1 Air Quality Issues

Comment: There are tremendous air quality advantages from nuclear energy, for both the health of Pennsylvania citizens, and from an economic view. (PBD07-2)

Comment: First, license renewal will maintain economic electric generation that does not produce green house gases, or other air pollutants, such as sulfur dioxide, nitrogen oxide, and particulars. (PBD07-3)

Response: *The comments are noted. They are general in nature and supportive of license renewal. The comments provide no new information and will not be evaluated further.*

A.1.9 Comments Concerning Category 1 Terrestrial Resourses

Comment: We recommend that secondary and cumulative evaluations of this project be primarily quantitative, that nuclear plants be considered along with the “other sources” of cumulative impacts, and that cumulative impacts to avian and terrestrial resources be included along with aquatic resources. (PBD21-15)

Response: *The impacts on the environment which result from incremental impact of the continued operation of Peach Bottom Units 2 and 3 for an additional 20 years when added to other past, present and foreseeable future actions were considered in the staff’s analysis set forth in the SEIS. The comment provides no new information and, therefore, will not be evaluated further. There was no change to the SEIS text.*

Comment: Multiple strata of vegetation would also create feeding and nesting cover for some migratory bird species, while perhaps reducing the effects of forest fragmentation on others. The Department is concerned that fragmentation of large forest blocks is reportedly contributing to the population decline of some area-sensitive migratory birds. Appropriate management of rights-of-way would make considerable land available for wildlife. (PBD21-11)

Comment: We also recommend that the cumulative effects of transmission line operation and maintenance be part of the evaluation. Topics such as forest fragmentation, electromagnetic field effects, bird collisions, and contaminants should be explored. (PBD21-18)

Comment: As implied elsewhere, Exelon should identify state-of-the art technology, design, operation and maintenance for cooling water systems, transmission lines and other operating features of nuclear plants. These features should be incorporated into the cumulative impact analyses and the existing projects when appropriate during the relicensing process. (PBD21-19)

Comment: Require an assessment of cumulative effects from transmission line operation and maintenance, including forest fragmentation, electromagnetic field effects, bird collisions, and contaminant issues. (PBD21-30)

Response: *The comments are noted. During the course of the assessment the impacts on the environment which result from incremental impact of the continued operation of Peach Bottom Units 2 and 3 for an additional 20 years when added to other past, present and foreseeable future actions were considered. The GEIS for license renewal (NUREG-1437) determined that the effects of electromagnetic fields on vegetation or wildlife and the effects of bird collisions with transmission lines were not likely to be significant at any site. Evaluation of the information provided by the applicant and inspection of the transmission corridor did not indicate the presence of any new and significant information with respect to this generic conclusion.*

The applicant has indicated that the Peach Bottom to Keeney transmission line is an integral part of the electrical transmission grid in southeast Pennsylvania, northern Maryland, and northern Delaware, and that the line will remain operational and in use even if the license for Peach Bottom Units 2 and 3 are not extended. In general, the right-of-way is maintained with a multi-layer vegetative community that reasonably minimizes the impacts of fragmentation. Accordingly, removal of the Peach Bottom to Keeney transmission line would, at best, have no effect on forest fragmentation and would likely exacerbate any problems because new corridors or tie-ins would need to be developed.

There is no indication that there are significant contaminant issues associated with continued operation and maintenance of the Peach Bottom to Keeney transmission right-of-way. With respect to cooling water systems, the staff did identify the technology used for the design, operation and maintenance for cooling. The potential impacts of cooling are addressed and the

staff concluded that no further mitigation was needed. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.

Comment: Transmission towers frequently leach zinc, which is toxic to vegetation and creates bare soil areas. PCBs often leak from old transformers. Remediation is possible and should be a condition of relicensing. Herbicide use should be minimized. (PBD21-8)

Response: *Although it is acknowledged that zinc can leach from galvanized steel structures such as transmission towers, the scientific literature indicates that detectable levels of soil contamination are not normally found more than a couple of meters from the towers. In those cases in which detectable levels are found in the soil, it rarely appears to be at levels that are detrimental to plants. No bare areas or other obvious signs of contamination were observed during the on-site inspection of the transmission right-of-way. There are no transformers on the Peach Bottom to Keeney transmission line. Herbicides are used in accordance with applicable regulations and has maintenance procedures that help to minimize the use of herbicides. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Transmission lines are frequently kept in early stages of succession, grassed or farmed. Soil erosion from these areas contributes to the degradation of streams, rivers, and bays by adding nutrients, sediment, and pollutants of concern in the Chesapeake and Delaware Bay drainages. We recommend that rights-of-way be maintained to avoid erosion of sediments into surface waters. One measure to control erosion would be to maintain multiple vegetative strata to reduce splash, sheet and gully erosion. (PBD21-9)

Comment: Require applicant to maintain multiple layers of vegetative cover in transmission line rights-of-way to reduce or control splash, sheet and gully erosion. (PBD21-27)

Response: *The rights-of-way maintenance practices used by the applicant were evaluated during the preparation of this SEIS, and the rights-of-way associated with this relicensing action were inspected. No signs of significant erosion were observed during the field inspection. The lines are maintained with the goal of keeping a self-perpetuating, mixed vegetative stand within the rights-of-way that are not used for agriculture. The applicant has supported research on this topic (e.g. Green Lane Research Project). The applicant believes, and the Staff agrees, that such a vegetation maintenance program is not only the most environmentally benign, but also can significantly reduce right-of-way maintenance costs. Portions of the rights-of-way are currently farmed, but these areas constitute well under 1% of the agricultural land in the area, and removing these areas from agricultural production would have an undetectable effect on the regional water bodies. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: We suspect that many transmission line corridors expand opportunities for various forms of recreation. Some of these (i.e., off-road vehicle use) may result in alteration, degradation or destruction of fish and wildlife habitats, particularly streams and wetlands, as well as the harassment and disturbance of wildlife. We recommend that controlled public use of rights-of-way (type and season) to avoid such degradation be a condition of relicensing. (PBD21-10)

Comment: Require controlled public use of transmission line rights-of-way (type and season) to avoid erosion and sedimentation. (PBD21-28)

Comment: Transmission lines kept in early successional stages prevent nesting by birds requiring tree cavities. Excellent management opportunities exist to enhance some rights-of-way by providing and maintaining nest boxes for cavity-nesting species like bluebirds, great crested flycatchers, wrens, and chickadees, displaced from areas where forest has been cleared. (PBD21-12)

Response: *In the GEIS, the staff concluded that the impacts of power line right-of-way management (cutting and herbicide application) on wildlife are expected to be of small significance at all sites. No new and significant information regarding the Peach Bottom Atomic Power Station was identified that would change this generic conclusion. The lines are maintained with the goal of keeping a self-perpetuating, mixed vegetative stand within the portions of their rights-of-way that are not used for agriculture. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: We recommend that plans for routing existing lines to avoid wetlands be developed in consultation with the USFWS as part of the relicensing process. (PBD21-13)

Response: *The Peach Bottom-to-Keeney transmission line does not cross any wetlands that would be used by waterfowl or herons, except for the required crossing of the Susquehanna River at the plant site. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: To avoid and minimize taking migratory birds, active nests, and their eggs, we recommend that time-of-year restrictions on vegetation clearing and maintenance on rights-of-way be part of any license or amendment. In the Northeast, such restrictions would include the primary migratory bird nesting season from April 1 to July 15 (for raptors, it is February 1 to July 15). Buffers around active raptor nests of at least 100 meters may be sufficient. In addition, activity within a 100-meter radius of raptor nests should be avoided from February 1 through July 13. (PBD21-14)

Response: *The contractors who perform the majority of the transmission right-of-way maintenance for the applicant have a nation-wide policy concerning Migratory Bird Treaty Act compliance which stipulates that field crews must look for signs of birds and wildlife, and they must not disturb any birds, nests, or other wildlife. These restrictions are sufficient to address the concern identified in the comment. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Require maintenance of transmission line right-of-ways for wildlife feeding cover and nesting activities, while minimizing habitat degradation and encouraging habitat enhancements. (PBD21-26)

Response: *The applicant's right-of-way maintenance procedures were evaluated and the rights-of-way associated with the proposed license renewals were inspected by the staff. The rights-of-way were found to support a mixture of shrubs, forbs and grasses that would be supportive of a diverse wildlife community and there was minimal indication of erosion or other forms of habitat degradation. The applicant strives to maintain a self-perpetuating, mixed vegetative stand within the rights-of-way that are not used for agriculture. The staff has concluded that these procedures adequately provide for wildlife habitat while minimizing adverse impacts. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

A.1.10 Comments Concerning Category 1 Human Health Issues

Comment: Realistically there is no safe level of radiation. Why do we play these safe level radiation games? Why do we do that? (PBD09-10)

Comment: So why would we continue a process when we know it does this kind of harm to human health? I believe Peach Bottom has the potential to be an enormous, enormous health risk. (PBD09-11)

Comment: I would like to have data on cancer cases, birth defects, and stillbirths in a ten mile radius of the plant, and compare this information to the national average. (PBD16-10)

Comment: The Trade Center was attacked, and numerous chemicals, such as silicon, and asbestos, were put into the atmosphere at higher levels. Well the EPA went in, did a study and said, yes, the levels are higher, but they are within safe limits, therefore they are harmless. At the same time this is happening about a quarter of the workers were suffering from some sort of respiratory ailment. Three percent of them so badly that they are on the verge of having to retire. So we think the same should occur here in terms of nuclear reactors. And to do that you need two items. (PBD06-5)

Comment: You must look at the disease rates and particularly at the cancer rates in the local area. (PBD06-6)

Comment: Since 1987 the rate is 31 percent above the U.S. average, okay? Something happened that turned a low childhood cancer area into a high childhood cancer area. Is it radioactive, is it some sort of other factor that must be looked at? (PBD06-7)

Comment: Again, these are questions that remain unanswered. Whether or not radioactive plays a role, or not has to be determined. (PBD06-8)

Comment: A geneticist has asked me, repeatedly, how the NRC, in determining dose impacts, deals with not only the child, and not only the fetus, and not only the embryo, but cumulative impact upon the ova that a woman carries through her life, and that are the basis of, of course, the ultimate embryo, fetus, and child? (PBD05-1)

Comment: I am appalled at the unwillingness of the Nuclear Regulatory Commission, and EPA, and DOE, to consider the information that is now becoming available concerning the impacts of ionizing radiation on the well being of living creatures, organisms of all kinds. (PBD05-6)

Comment: Because those standards that were mentioned to us by Dr. – those standards were, in fact, developed based upon standard man, using weighting factors for organs, divorced from the reality of the variabilities in human susceptibilities to diseases, to exposures, to the synergies between and among the sources of contamination that are with us, throughout our environment. (PBD05-7)

Comment: But the situation with regard to the health impact of the uses of ionizing radiation that increase within our society, within our environment, those today are being looked at in a very different way. And that way is through molecular and cellular radiation biology, that is really beginning to get us an understanding of the mechanisms of the damage. And I don't see that is being factored into this study, anymore than the totalities, the systemic approaches that are necessary in order to have a valid environmental impact statement. (PBD05-9)

Comment: What is meant by small risks? Does that mean if my family and I get sick, that is just a small amount? What happens as the environmental impact statement said, that in 45 years the increase in population will be 62 percent, does small then become medium risks? (PBD08-1)

Comment: In considering a 20-year license extension, and 20 years additional operation, in our view the critical population that would determine that operation is the children. And that the cumulative effect, that there is a cumulative effect of 20 years a additional operation, with ongoing routine releases that build up in the environment, that bio-magnify. The focus of our

concern, and it should be your concern, is the bio-magnification to the children in this area. (PBD01-2)

Comment: So there are, suddenly, a great many additive sources for exposures. And it is not clear how those are incorporated in your analyses (PBD05-3)

Response: *Section 2.2.7 presents the radiological impacts of effluents from Peach Bottom Units 2 and 3 operations. This section presents information about the amount of radioactive material released in effluents by the plant and assessed the radiation doses to the general public. Based on this data, the staff concludes that the impact to the environment from radioactive releases from Peach Bottom Units 2 and 3 is SMALL.*

Information on public health issues is readily available from the Commonwealth of Pennsylvania Department of Health. The Pennsylvania Department of Health provided a review of the information submitted by the Radiation and Public Health Project (RPHP) on increased cancer rates (letter from Joel H. Hersh, Pennsylvania Department of Health to the U.S. NRC dated November 12, 2002). This correspondence is included in Appendix A of this SEIS. The review states that the conclusions of increased cancer rates in the area of the Peach Bottom site by RPHP cannot be supported. The review by the Pennsylvania Depart of Health also points out that "radiation exposures from nuclear power plants are extremely low" with a range of 0.00001 miilirem to 0.05 millirem per year. The staff observes that these doses are at least three orders of magnitude less than the average dose to a person in the United States from natural radiation sources.

Health effects from radiation are a well-studied environmental hazard according to the General Accounting Office. Over 86,000 studies have been performed on the biological effects of radiation, and none of the scientifically valid studies show any radiation effects at doses less than 10,000 millirm. For example, in 1990, the U.S. Congress requested the National Cancer Institute to study cancer rates in the areas surrounding nuclear power plants to determine if there were detrimental effects on the population. This extensive report found no evidence of a link between operating nuclear power plants and any increase in cancers. In addition, there are no indications in any of the scientific studies that low-level radiation exposure is harmful to children or a contributory factor to infant mortality. There are new studies examining molecular effects of radiation. However, the implications of these studies are not clear at this time. The NRC is always interested in new information and will continue to evaluate such information in terms of public health and safety.

The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.

Comment: If somebody came into this room with a gun and killed 24 people in this room, promised not to kill anybody else for the next 20 years, would we allow them to walk out? Would

we allow them not to be held responsible for those 24 lives in this room? That is what the Nuclear Regulatory Commission is saying, that they are going to give a license to Peach Bottom to continue to do, 24 deaths. (PBD13-12)

Comment: According to the Federal Register Notice, each re-licensing is expected to be responsible for the release of 14,800 person rem of radiation during its 20 year life extension. (PBD03-7)

Comment: The NRC calculates that this level of radiation release, spread over the population, will cause 12 cancer deaths per unit. (PBD03-8)

Comment: The NRC acknowledges that the allowable limit, 100 millirem a year, for radiation exposure, via air, from any reactor to the general public, will cause a fatal cancer in 1 out of 286 people exposed. This is very high when compared to the standard of 1 in a million considered an acceptable level of human sacrifice for industrial activities. (PBD03-11)

Response: *This calculated value of 12 additional deaths from fatal cancer over the 20 years of additional operation of a nuclear power plant is the result of several conservative assumptions. This value is, in fact, a calculated upper bound value. It does not mean that 12 people will die from cancer as a direct result from an additional 20 years of continued routine operation of any nuclear power plant.*

These calculations use the concept of collective dose. Collective dose estimates effects across a very large population, assuming that a small amount of radiation dose spread out among a large population would yield similar effects to a larger amount of radiation dose to a much smaller population. This is a very conservative assumption. The Health Physics Society, www.hps.org, states "[b]elow the dose of ten rem, estimations of adverse health effect is [sic] speculative. Collective dose remains a useful index for quantifying dose in large populations and in comparing the magnitude of exposure from different radiation sources. However, for a population in which all individuals receive lifetime doses of less than 10 rem above background collective dose is a highly speculative and uncertain measure of risk and should not be quantified for the purposes of estimating population health risks."

The cancer risk factors used in this calculation are also quite conservative. They are from the BEIR-V report, "Health Effects of Exposure to Low Levels of Ionizing Radiation." In this report it is estimated that "if 100,000 persons of all ages received a whole body dose of 0.1 Gy (10 rad) [roughly equivalent to 10 rem] of gamma radiation in a single brief exposure, about 800 extra cancer deaths would be expected to occur during their remaining lifetimes in addition to the nearly 20,000 cancer deaths that would occur in the absence of radiation. Because the extra cancer deaths would be indistinguishable from those that occurred naturally, even to obtain a measure of how many extra deaths occurred is a difficult statistical estimation problem."

The radiation dose contribution to the population from current nuclear power plants is estimated to be 4.8 person-rem per year, whereas the dose contribution to the population from the complete uranium fuel cycle is 136 person-rem per year. The dose to an individual is only a very small fraction of these population doses. The contribution to the average dose received by an individual from fuel cycle-related radiation and other sources is listed in the following table. The nuclear fuel-cycle contribution to an individual's average radiation dose as shown in the table is extremely small (less than 0.001 rem per year).

At the request of Congress, the National Cancer Institute (NCI) conducted a study in 1990, "Cancer in Populations Living Near Nuclear Facilities," to look at cancer mortality rates around 52 nuclear power plants, including Peach Bottom Units 2 and 3, nine Department of Energy facilities, and one former commercial fuel reprocessing facility. The NCI study concluded, "from the evidence available, this study has found no suggestion that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancers in populations living nearby." In addition, the American Cancer Society has concluded that although reports about cancer case clusters in such communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population.

Source	Dose (mrem/yr)	Percent of Total
Natural		
Radon	200	55
Cosmic	27	8
Terrestrial	28	8
Internal (body)	39	11
Total Natural	300	82
Artificial		
Medical x-ray	39	11
Nuclear medicine	14	4
Consumer products	10	3
Total Artificial	63	18
Other		
Occupational	0.9	<0.30
Nuclear Fuel Cycle	<1	<0.03
Fallout	<1	<0.03
Miscellaneous	<1	<0.03

Source: NCRP Report 93, "Public Radiation Exposure from Nuclear Power Generation in the United States" as abstracted by te University of Michigan (http://www.umich.edu/~radinfo/).

The GEIS identified radiation exposures to the public during the license renewal term as a Category 1 issue. This comment provides no new information and, therefore, will not be evaluated further in the SEIS.

Comment: I would like to know the type of radioactive isotopes at the plant, and the half life of these isotopes. Are strontium 90 and strontium 89 the only radioactive isotopes at the plant? (PBD16-11)

Comment: And very interesting that here in Lancaster, York, and Chester County it [strontium-90?] is very high, it is 26 percent higher with the children. (PBD03-20)

Comment: Why has the government stopped taking in body measurements of strontium 90 in bones and teeth? The U.S. Agency for Toxic Substances and Disease Registry, is starting to measure toxic chemicals to determine human exposure. This is the best proof of toxins in the environment. The same needs to be done for radionuclides, particularly Sr-90 in the bones and teeth. Why hasn't the government done this since 1963? (PBD08-3)

Comment: And the other thing we found, so far, in southeast Pennsylvania and elsewhere, the children born in the 1990s have higher levels of strontium 90 than do those born in the '80s, they are going up slightly in Pennsylvania up 12 percent. This cannot be due to the old bomb test fallout just decaying, it has to be due to a current source of strontium 90 which is, can only be nuclear reactors. (PBD06-9)

Response: *Section 4.7 of this SEIS evaluated the studies related to strontium-90 radiation levels in deciduous (baby) teeth and the use of these studies as "in-body" measurements of radioactive materials. The staff concluded from this evaluation that the claims of elevated levels of childhood cancer in the vicinity of the plant caused by the release of strontium-90 during routine operations is without scientific merit. The staff also concluded that these comments do not provide any new and significant information. As part of its Radiological Environmental Monitoring Program, Exelon conducts monitoring of a wide range of fission and activation products (including strontium-89 and strontium-90) in and around the Peach Bottom site. Monitoring of liquid and gaseous effluents is discussed in Section 2.2.7 of this SEIS. This section concluded that the impact to the environment from radioactive releases is SMALL. Sampling and analysis of the environment, which includes fish samples, is also conducted. All fission and activation product concentrations were below the specified limits of detection for the instruments used to measure them.*

The Federal government stopped the analyses of strontium-90 in bones and teeth after atmospheric testing of nuclear weapons was discontinued by the Soviet Union and the United States because there were no significant additional sources of strontium-90. However, the Environmental Protection Agency maintains a sampling program across the United States, including the Philadelphia and Washington, DC areas. The results of these studies are reported

quarterly and can be located on the EPA website. All sampling results for the latest reporting period, April–June 2000, were below the non-detected levels. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.

Comment: And not, since we are all here, and I accept your, I'm not angry with anyone, but now they are going to give all of us their toxicological waste. And no provision or thought was given to this at the inception of these plans, none. I hope you are thinking about it, gentlemen. (PBD04-5)

Response: *Nonradioactive Waste Systems are described in Section 2.1.5 of this SEIS. Section 2.1.5 states that Peach Bottom Units 2 and 3 are small quantity hazardous materials generators, with the principal non-radioactive effluents consisting of hazardous (chemical) wastes, lubrication oil wastes, and sanitary waste. This section also provides data on yearly generation amounts. All of the hazardous materials waste is shipped to licensed facilities for proper storage and disposal. No other significant toxicological waste is generated from the plant. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Twenty years ago the federal government did a study and showed that if either one of the cores of the Peach Bottom reactors had a full meltdown, 72,000 people would die, 45,000 would suffer acute radiation poisonings, and 37,000 others would develop cancers. Now, remember, this is minimum estimate, because if both reactors had meltdowns you could double that. This was done 20 years ago, the population has grown since, it only considers the area within 30 miles of the plants, and it ignores the stored fuel, the radioactive waste, which consists of much, much more radiation than is in the core in fact, there is hundreds of Hiroshima bombs worth of radiation in there. The EIS ignores this. (PBD06-1)

Response: *The CRAC-2 study evaluated siting criteria and was not designed or intended to be used as a study on health effects from nuclear power stations. These numbers are not representative of actual or projected deaths. The uranium in nuclear reactors is not fissile grade material and therefore will not explode like a nuclear weapon.*

Comment: But whenever a community has requested a health study, and the health study has shown that, indeed, there are excesses of certain cancers, or leukemia, the response has been, but that is too small a sample to have statistical significance. And I think we are at the point where we need to think about how many such insignificant studies add up to very substantial significance to be taken seriously. (PBD05-8)

Response: *The American Cancer Society, on its web site, has stated "Ionizing radiation emissions from nuclear facilities are closely controlled and involve negligible levels of exposure for communities near such plants. Although reports about cancer case clusters in such*

communities have raised public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population." The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.

Comment: And related to it is the issue of how the NRC will incorporate the additive doses received from deregulated released, recycled, and reused radioactive materials, not only those generated at the plant, and then subsequently released, either as materials or waste, for recycle, but also essentially the other doses, each of them presumably small, that would be received from other sources of recycled radioactive. (PBD05-2)

Response: *Any radioactive materials that are released will be within regulatory limits. In determining the release limits for recycled materials, several scenarios were developed. These scenarios were worst case scenarios where the individuals would receive maximum exposures from all types of background radiation as well as from recycled materials. The limits therefore account for such impacts from radiation dose. The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: The Pottstown area gets much of its milk from dairies located in Lancaster and York counties, near Peach Bottom. And people ingest Peach Bottom milk. (PBD09-12)

Response: *As part of its Radiological Environmental Monitoring Program, Exelon conducts sampling and analysis of the terrestrial environment, including analyzing milk samples for concentrations of iodine-131 and gamma emitters. No fission or activation products have been found. Sampling locations, collection methods, frequencies, and results are reported in the yearly Annual Radiological Operating Report.*

Additionally, the EPA Office of Radiation and Indoor Air, National Air and Radiation Environmental Laboratory (NAREL) provides data from the Environmental Radiation Ambient Monitoring System (ERAMS). The environmental radiation data (ERD) is compiled and published quarterly, and the reports are available online at www.epa.gov/narel*. Sampling for radioactivity (including iodine-131 concentrations) in milk is done quarterly at 55 sampling sites in the U.S. The latest published data for April - June 2000 shows that iodine-131 concentrations were below the "not detected" levels for all 55 sampling sites (including Philadelphia and Washington DC). The comment provides no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: How often are measurements done on the milk, and milk products that enter our communities? (PBD08-7)

Response: *The Environmental Protection Agency maintains a sampling program across the United States. The result of these studies are reported quarterly and can be located on the EPA website.*

Comment: How often are these products tested for strontium 90 and cesium 137, the longer acting isotopes? What about measurements in fish? (PBD08-8)

Response: *As reported in the Peach Bottom Units 2 and 3, Annual Radiological Operating Report, milk samples are collected biweekly from several farms at varying distances from the plant. Typically, two gallon grab samples are collected from a bulk tank at each farm twice a week while cows are on pasture, and monthly during other times. Analysis is done on iodine-131 on biweekly and monthly samples, and gamma spectrometry is conducted quarterly. The sampling for gamma emitters includes potassium-40 and cesium-137, among others. During the sampling period, January 1 through December 31, 2000, naturally occurring potassium-40 was found in all samples with values ranging from 1,360 to 1,700 pCi/L. These values are consistent with natural potassium-40 found in milk (typically 2,000 pCi/L). All other nuclides analyzed for were less than the minimum detectable concentrations.*

Fish samples (bottom feeders and predators) are collected from two locations semi-annually. Sampling for gamma emitters includes cobalt-60 and cesium-137, among others. During the sampling period January 1 through December 31, 2000, all fission or activation products were below the non-detectable levels. The comment provides no new information and, therefore, will not be evaluated further. There was no change to the SEIS text.

Comment: Section 4.1 – Accumulation of contaminants in Sediment Page 4-6. Is there routine monitoring of sediments to assess changes in conditions. (PBD22-5)

Response: *Section 2.7 of this SEIS briefly describes the radiological environmental monitoring program (REMP) conducted by the licensee at the Peach Bottom site since 1974. The program requires sampling and analysis for surface waters, aquatic environment (fish and sediment), atmospheric environment (airborne and terrestrial), milk, and ambient gamma radiation levels, among others. The sediment sampling program includes several locations downstream of the Peach Bottom site. The sampling results are summarized in an "Annual Radiological Environmental Operating Report." The results from the activities of contaminants in the samples represents a dose which is 0.005% of the annual limits. These results were found to be consistent with those from previous years. The comment provides no new information, therefore the comment will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

A.1.11 Comments Concerning Category 1 Socioeconomic Issues

Comment: Second, license renewal will preserve good jobs for this area, and communities like Delta and Peach Bottom Township, where these plants are located, will benefit from the plant's continued operation. (PBD07-4)

Response: *The comment is noted. The comment is consistent with the findings of the SEIS. Public services were evaluated in the GEIS and determined to be a Category 1 issue. The comment provides no new information and, therefore, will not be evaluated further.*

A.1.12 Comments Concerning Category 1 Uranium Fuel Cycle and Waste Management

Comment: The entire nuclear fuel chain, the uranium, primary mines on the lands remaining to the indigenous people, uranium conversion, enrichment, fuel fabrication, each step possesses workers, exposes workers and communities to radioactivity, and each step generates radioactive waste. (PBD03-10)

Comment: Almost 30 years later the fuel pools here at Peach Bottom are almost full. In fact they are putting some into dry cask storage, and the issue of Yucca Mountain, Nevada, being a permanent site, is moving along but it is still up in the air. It will be at least eight years before any transfers are to be made from there. That goes un-addressed here, as well. And the existence of this fuel, again, presents a threat to the public's health. (PBD06-4)

Comment: Why would the NRC renew the license for any nuclear plant when there is no safe way to dispose of the radioactive waste these facilities produce? (PBD09-6)

Comment: When spent fuel rods can't be disposed of safely, why would the NRC allow the process to continue, which produces more of them? (PBD09-7)

Comment: We must assess the nuclear age very carefully. There are more than 450 reactors in operation on the planet today. Each generates radioactive waste that will be a threat to human life for hundreds of thousands of years. (PBD03-17)

Comment: But even if that happens Yucca Mountain is not going to have room for the waste that would be created in these extra 20 years. So you need to be talking about this in this report. Where is that waste going to go? (PBD14-4)

Comment: Now, why are we possibly allowing more of the spent fuel to be created when we can't fit it in this reactor? We are not going to have any place to throw it away, like Yucca Mountain. (PBD14-7)

Comment: Leaving the nuclear waste on site presents additional risks to the surrounding populations. We face far, far too much risk from nuclear waste already. Common sense tells us that the older the nuclear plants get, the more chance there will be for accidental disasters. Why would the NRC allow this increased risk? (PBD09-9)

Comment: There was no mention of my concern of the danger of spent radioactive fuel being stored on site. (PBD16-3)

Comment: Actually Frieda already made mention of it, in Northeast Pennsylvania, where they filled the dry casks with the wrong gases, argon and helium instead of just helium. Now the

NRC report from that stated that they don't know what impacts that might have, but it might degrade the effectiveness of these containers. (PBD14-5)

Comment: And in Point Beach, Michigan, and Palisades, you have the same kind of – not the same kind, but you have other dry cask storage incidents with hydrogen bubble explosions, and wind several times blowing several feet off of the surface, near defective wells with dry casks. (PBD14-6)

Comment: Indeed, it is imperative that we are supposed to be continuing in all our nuclear plant facilities, and the waste transportation actions, to improve in this new era of our homeland security concerns. (PBD17-3)

Comment: Furthermore, I suggest updated commentary be made from NRC persons to address highlighted security measures, both for on-site facilities and for nuclear waste transport off-site. It should be made clear that we all share responsibility as active citizens in Homeland Defense efforts to support continuing safe, efficient operation of our nation's nuclear power plants. (PBD17-5)

Response: *The comments are noted. Onsite storage of spent nuclear fuel is a Category 1 issue. The safety and environmental effects of long-term storage of spent fuel on site has been evaluated by the NRC, as set forth in the Waste Confidence Rule (10 CFR 51.23). In the Waste Confidence Rule, the Commission generically determined that spent fuel generated by any reactor can be safely stored on site for at least 30 years beyond the licensed operating life of the reactor, which may include the term of a renewed license. In the rule, the Commission also generically determined that such storage could be accomplished without significant environmental impact. In addition, the Commission stated in the rule its belief that there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for any reactor to dispose of the spent fuel generated in such reactor up to that time. The "Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS)," NUREG-1437 is based upon the assumption that storage of the spent fuel onsite is not permanent. This plant-specific supplement to the GEIS regarding license renewal for the Peach Bottom Atomic Power Station Units 2 and 3, is based on the same assumption. Likewise, the matter of processing and storage of low level waste is considered a Category 1 issue. The conclusion regarding this issue in the GEIS included consideration of the long-term storage of low level waste on site during the license renewal term. The comments provide no new information; therefore, the comments will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Transporting spent fuel rods from nuclear plants such as Peach Bottom in Pennsylvania, across the nation to Yucca Mountain, opens the door for all kinds of natural and terrorist catastrophes all along the way. (PBD09-8)

Comment: One of the things that I think need to be addressed in here, though, that I just looked through this and noticed, is that there is nothing addressing the spent fuel, and where that would go. And even if Yucca Mountain is built, and even if it manages to ship all the waste there with

no accidents, and all these things that we are all hoping, some people are hoping would happen, I don't want to see Yucca Mountain at all. (PBD14-3)

Comment: If you have an accident with one of these trucks carrying the waste, do not expect us to be capable of good care. So I'm sorry about that. As far as I know, at the present time, it is still in the state of lack of preparedness. (PBD11-1)

Comment: Baltimore had a little accident last summer, in one of our tunnels a train carrying chemicals, so that we are a little sensitive about the possibility that any waste materials that might come from here, might come down interstate 95 and maybe go through some of our tunnels. (PBD11-2)

Comment: We would, therefore, come to the conclusion, especially in Baltimore, and our steering committee has authorized me to tell you, keep your waste here, don't bring it through Baltimore, which is essentially saying close the plant down, and don't make any more waste. (PBD11-4)

Comment: And not just for the reasons that I'm telling you, we are not prepared to take care of the casualties if there is accidents, but because of the general idea of terrorists, and also the idea that the waste, if you are going to carry the waste, if you are going to create the waste, then it is best to have it stored at the most local site that there is, in terms of general hazard. (PBD11-3)

Response: *The comments are noted. The radiological and nonradiological environmental impacts from the transportation of fuel and waste attributable to license renewal of a power reactor were evaluated in Section 6.3 of the GEIS and the Addendum and are considered Category 1 issues. The Addendum to the GEIS specifically addressed whether the environmental impacts of the transportation of spent nuclear fuel are consistent with the values of 10 CFR 51.52, Table S-4 "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor" as applicable to license renewal, given that it is likely that spent fuel will be shipped to a single destination, such as the proposed repository at Yucca Mountain in Nye County, Nevada. The values in Table S-4 were found to be bounding when accounting for spent fuel shipments to a single destination.*

NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including threats against transporters of nuclear fuel and waste. Malevolent acts remain speculative and beyond the scope of a NEPA review. NRC routinely assesses threats and other information provided to them by other Federal agencies and sources. The NRC also ensures that licensees meet appropriate security levels. The NRC will continue to focus on prevention of terrorist acts for all nuclear facilities and will not focus on site-specific evaluations of speculative environmental impacts. While these are legitimate matters of concern, they should continue to be addressed through the ongoing regulatory process as a current and generic regulatory issue that affects all nuclear facilities and many activities conducted at nuclear facilities. The NRC has taken a number of actions to respond to the events of September 11, 2001, and plans to take additional measures. However, the issue of security and risk from malevolent acts against nuclear fuel and

waste transporters is not unique to facilities that have requested a renewal to their license and, therefore, is not within the scope of this Supplement. The comments do not provide new information and, therefore, they will not be evaluated further. Accordingly, there was no need to change the SEIS text.

A.1.13 Comments Concerning Category 1 Postulated Accident Issues

Comment: By 1985 the Mark 1 boiling water reactor, or BWR, was again singled out by the NRC for special attention, because of strong indications of a high probability that its containment would not survive several accident scenarios. (PBD01-4)

Comment: NRC director of nuclear reactor regulation, Harold Denton, told an industry conference that the Mark 1 has a high probability, as high as 90 percent for some accident sequences, such as an over pressurization accident. (PBD01-5)

Comment: And as one NRC staffer described, the containment's effectiveness, in an over temperature accident, core melt, as "like a hot knife through butter." (PBD01-6)

Comment: Well, on the risk assessment, I don't think any – the risk is always, it is a risk. And we shouldn't be, I don't think you would have a risk with how many people are going to die from windmills. (PBD03-19)

Comment: I continue to be concerned about an earthquake, given the proximity of the martic fault line (PBD16-7)

Comment: According to a Lancaster New Era article, on July 1st, 1994, corrosive cracks found inside a Peach Bottom reactor "could cause a meltdown during an accident or earthquake, the Nuclear Regulatory Commission said today. Cracks in the York County nuclear reactor are expected to grow, and will have to be monitored, the NRC said. NRC officials also warned that the cracks could lead to a meltdown if they shift during an accident, or a natural disaster? (PBD16-8)

Response: *The comments are noted. Design Basis Accidents, including events initiated by earthquakes, were evaluated in the GEIS and the impacts were determined to be small for all plants. As such, Design Basis Accidents are considered a Category 1 issue. The comments provide no new information and, therefore, will not be evaluated further.*

Comment: I would still like to know how many accidental releases of radiation have occurred at Peach Bottom since it began operations. I would like to know the type of radiation, the amount of each release. (PBD16-9)

Response: *Abnormal releases from Peach Bottom Units 2 and 3 are reported to the NRC as part the yearly Radioactive Effluent Release Report. If the abnormal event involves releases of radioactive materials, their isotope quantities and dose contribution is added to yearly totals being reported. A review of the past several years of the Radioactive Effluent Release Report*

shows that the yearly doses from all releases are well within the annual limits. There was no change to the SEIS text.

Comment: But as the technology has proven, with its people who are in pursuit of nuclear weapons, and the security structures that are required for nuclear technology can't, and will never be there, for the total protection of the population at large. (PBD12-9)

Comment: Why would the NRC renew the license for such a major target for terrorism? The potential to destroy so much, and harm or kill so many people must be ended, not renewed. Even people in the greater Pottstown area could have their health adversely impacted by a terrorist attack, or accidental disaster at Peach Bottom. (PBD09-3)

Comment: The environmental impact statement does not address security concerns regarding the structure vulnerabilities of Peach Bottom's elevated irradiated fuel storage ponds. (PBD01-8)

Comment: It is NIRS stated concern that these elevated storage ponds are extremely vulnerable to a variety of acts of sabotage, radiological terrorism. The environmental impact statement does not adequately address the increased risk by significantly extending the Peach Bottom operating license, and the adverse environmental impact associated with a successful terrorist attack on this vulnerable target. (PBD01-9)

Comment: The NRC report goes on to state; "it is further estimated that one of two [aircraft] crashes damage the spent fuel pool enough to uncover the stored fuel. For example, 50 percent of the time the location of the damage is above the height of the stored fuel." (PBD01-10)

Comment: This raises the questions for NIRS what is the blow-in-rating for such, for this particular section of Peach Bottom? Where has NRC structurally analyzed this section of the reactor building and evaluated the degree of risk associated with extending the time at which we are vulnerable to the consequences of off-site radiation releases from an act of radiological sabotage at Peach Bottom? NIRS contends that the identified vulnerability is an unacceptable risk, with unacceptable consequences, in the clear and present danger of a post September 11th world. A re-licensing proceeding that turns a blind eye on this glaring vulnerability is a sham on the public health and safety, and the environment. (PBD01-11)

Comment: Much to the discussion since the September 11th. Attacks has focused on the resistance of reactor contaminant structures to aircraft strikes. I wonder about Peach Bottom. We all know it was built way too long ago, it won't hold up. (PBD03-16)

Comment: And while that is admirable that you have that, I think it would also be appropriate to have site specific terrorism impact information in here. (PBD14-1)

Comment: But there is nothing about severe, like deliberate damage being done to this reactor. And as Paul Gunter gave, on some very clear testimony on the vulnerability site specifically to this reactor, I think that needs to be addressed. (PBD14-2)

Comment: And the dry cask storage facilities don't even work, and they are glaring terrorist targets, and we know this, and I talked about this the last time, it was after September 11th, then too. (PBD14-8)

Comment: It does not ignore two new threats that we have here, beyond when the plant was opened. First of all, September 11th., changed everything. We now have this very new, and very clear, and very serious threat of a terrorist attack towards a nuclear plant, which certainly calls out for a new study, and consideration of safety factors. Number two, we are not talking about a plant that is just about to open, we are talking about a nuclear plant that is going to be operating from age 40 to 60. (PBD06-12)

Response: *In a recent decision in another license renewal proceeding, the Commission discussed the terrorism and sabotage issues raised in the comments. See Duke Energy Corp. (McGuire Nuclear Station, Units 1 & 2, and Catawba Nuclear Station, Units 1 & 2), CLI-02-26, 56 NRC ___ , slip op. at 6-7 (Dec. 18, 2002). In that decision, the Commission found that NEPA imposes no legal duty on the NRC to consider intentional malevolent acts on a case-by-case basis in conjunction with commercial power reactor license renewal applications. The Commission concluded that the "environmental" effect caused by third-party miscreants is simply too far removed from the natural or expected consequences of agency action to require a study under NEPA.*

The Commission has also indicated that terrorism differs from matters ordinarily considered in an EIS. An EIS may discuss, for example, such matters as likely effects on local water, air quality, vegetation, wildlife, culture, and socioeconomic concerns. These effects are reasonably certain; an EIS can quantify them to a fair degree of precision. Terrorism, by contrast, comes in innumerable forms and at unexpected times and places. It is decidedly not predictable, and it is not a natural or inevitable byproduct of the granting of an application. For these reasons, the Commission has stated that an EIS is not an appropriate format in which to address the challenges of terrorism.

In its recent license renewal decision, the Commission also noted that, particularly in the case of a license renewal application, where reactor operation will continue for many years regardless of the Commission's ultimate decision, it is sensible not to devote resources to the likely impact of terrorism during the license renewal period, but instead to concentrate on how to prevent a terrorist attack in the near term at the already licensed facilities. Finally, the Commission determined that there appears to be little practical benefit in conducting a license renewal terrorism review.

Nevertheless, the Commission did indicate that its decision not to use NEPA as a vehicle for a terrorism review does not mean that it is ignoring the issue. Rather, the Commission is closely examining the current security and protective framework and already has ordered interim improvements at licensed nuclear facilities, including reactors. We expect further improvements as the internal comprehensive review moves forward.

A.1.14 Comments Concerning Category 2 Aquatic Resource Issues

Comment: Section 4.1.2 – A 1977 NPDES permit is referenced and the best technology available for the intake structure for minimizing adverse environmental impacts. Although subsequent permit reviews have required no further entrainment studies is this still the best technology available? (PBD22-7)

Comment: This text is somewhat confusing in that it can be interpreted as meaning that only 23 samples were taken at the plant and that the numbers impinged should be extrapolated to determine the total annual impingement. However, we are aware that each of the samples represents a cumulative sample – since the prior sample – such that the numbers of fish reported from the 23 samples represents the total number impinged over the study period. We suggest that clarification is necessary to substantiate the conclusion that impingement is not regarded as significant. (PBD20-1)

Comment: In the same section, on page 4-16, the statement is made that the losses of shad and river herring due to impingement are a very small percentage of the total number of out migrating fish and that fish losses are not sufficiently high to pose a threat to the fish restoration effort. While the numbers are small at the present time, the Anadromous Fish Restoration Cooperative 2002 for the Susquehanna River anticipates much larger run sizes in the future. With significant population increases, the numbers impinged may increase and could begin to assume significance. Because current EPA regulations require that PBAPS renew its NPDES permit every five years, we recognize and accept that this issue can be addressed and, if necessary, mitigated through the NPDES process at the time of each renewal. We suggest here, however, that this document in its final version should note that an expected increase in abundance of migratory fishes as a result of restoration efforts could result in an increase in impingement, but that such impingement impacts will be captured and addressed by the NPDES permitting process. (PBD20-2)

Comment: Require development and implementation of an appropriate year-round assessment method for evaluating Susquehanna River fish losses and a mitigation plan for losses of Susquehanna River fish (resident and anadromous) caused by intake impingement. (PBD21-31)

Comment: Currently, there are no provisions for mitigating impacts to Susquehanna River fish caused by impingement by the intakes at the Peach Bottom facility. The current fish collection practices conducted by the licensee's consultant, Normandeau, while useful for monitoring shad

mortality, cannot be considered an acceptable form of mitigation. As a long-term (for the life of the license) mitigation practice we find this practice inappropriate. Although the current level of mortality of American shad, by itself, is not considered detrimental to the Shad Restoration Program, the loss must be considered within the context that fish mortality numbers are expected to increase as the number of American shad restored to the river also increases. Additionally, the losses of resident fishes are not accounted for. In this context, we strongly recommend that NRC and Exelon determine the impact on all finfish, not only American shad, and other aquatic life due to impingement in the Peach Bottom water intake in the Conowingo Pool, and that appropriate long-term mitigation measures be developed and implemented by the licensee to mitigate for riverine and anadromous fish losses. (PBD21-20)

Comment: The number of impinged juvenile shad found has ranged from a high of 341 fish (October 14 - December 10) to a low of 3 fish in 1989 (August 22 through November 22). This level of mortality, by itself, is not considered detrimental to the Service's restoration program, but the loss must be considered within the context of other sources of loss. These numbers are expected to increase as the number of American shad restored to the Susquehanna River also increases. (PBD21-3)

Comment: At a minimum, the applicant should establish a year-round screen sampling protocol to account for year-round fish losses. (PBD21-4)

Response: *The NRC staff concludes that no further mitigation is needed for impingement. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: As a means to avoid adverse impacts to aquatic life, the Department recommends that NRC require upgrading of this project to include a closed cooling system instead of the existing open cooling system. (PBD21-2)

Comment: Require system upgrading at this project to include a closed cooling system instead of the existing open cooling system. (PBD21-23)

Response: *As set forth in Sections 4.1.1 - 4.1.4 of the SEIS, the staff reviewed the Clean Water Act 316(a) and (b) demonstrations for Peach Bottom, Units 2 and 3 (PBAPS) and the ER relative to potential effects of the cooling system due to operation of PBAPS on the aquatic and other resources in the area. Based on this review, the staff has concluded that the potential impacts are SMALL, and further mitigation is not warranted. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Exelon uses traveling mesh screens and a spray wash system together to reduce or minimize impacts of fish. To further minimize the impacts, in the process of replacing worn or damaged screens, the screens should be replaced with mesh size less than or equal to one

millimeter. Additionally, entrance velocities should be less than or equal to 0.5 feet per second (Gowan and Garman 1999). Impinged biota should be removed from the traveling screens and returned to the river. (PBD21-5)

Comment: Require the intake screen replacements to have a mesh size of one millimeter or less, intake water velocities less than 0.5 feet per second, and return biota collected by the traveling screens returned to the river. (PBD21-25)

Response: *The staff has reviewed the available information and based on the results of entrainment studies and the operating history of Peach Bottom Units 2 and 3 intake structure, concludes that the potential impacts of entrainment of fish and shellfish in the early life stages in the cooling water intake system are SMALL. Additionally, the staff has reviewed the available information and based on the results of impingement studies and the operating history of Peach Bottom Units 2 and 3 intake structure, concludes that the potential impacts of impingement of fish and shellfish the on debris screens of the cooling water intake system are SMALL. During the course of the SEIS preparation, the staff considered mitigation measures for the continued operation of Peach Bottom Units 2 and 3. When continued operation for an additional 20 years is considered as a whole, all of the specific effects on the environment (whether or not "significant") were considered. Based on its assessment, the staff concludes that the measures in place at Peach Bottom Units 2 and 3 (e.g., intake screens and the waste heat treatment facility) provide mitigation for all impacts related to entrainment and no new mitigation measures are warranted. The comments provide no new information and, therefore, will not be evaluated further. Accordingly, there was no need to change the SEIS text.*

Comment: Relicensing has the same consultation requirements as original licensing under the Fish and Wildlife Coordination Act (FWCA). Consultation under NEPA does not supplant the need for consultation under FWCA; although these laws are similar, they do not have the same requirements with respect to fish and wildlife, and reporting by the USFWS. As Exelon develops an application for relicense, the USFWS should be consulted during scoping of issues, study needs, and interpretation of results. Draft applications should be made available by the applicant for review and comment. The USFWS comments (i.e, FWCA report) will be provided to the applicant and should be part of their application submitted to the NRC. That report should be considered by NRC when preparing the EIS for the plant. There may be a need for further consultation under the FWCA on NRC's preferred alternative if the "Federal Action" will be significantly different than that proposed by the applicant. (PBD21-21)

Comment: The Department appreciates NRC's request for comments on the draft Supplement 10 and is willing to cooperate further to the extent that we can. At the same time, the USFWS requests that the NRC initiate consultation under the FWCA for relicensing nuclear power plants. The Service does not believe that either the equal consideration or mitigation planning provisions of the FWCA are satisfied by the NEPA process alone. To fully consider the protection of fish and wildlife resources and their habitats affected by each plant, NRC should request that the

Service provide NRC with reports in accordance with the FWCA which should be part of NRC's decision document. (PBD21-22)

Comment: Initiate and continue consultation with the USFWS under the FWCA for the relicensing of the Peach Bottom Nuclear Power Plant. (PBD21-32)

Response: *The FWCA requires federal agencies to coordinate their activities to minimize adverse effects on fish and wildlife. Regarding the environmental review for the Peach Bottom license renewal, the NRC staff interaction with Fish and Wildlife Service consisted of the following correspondence as described below.*

On October 11, 2001, the staff sent a letter to Mr. John Wolflin, USFWS, informing them of receipt of the Exelon application for license renewal at Peach Bottom, and our intent to prepare an EIS for this proposed action. The staff requested any information USFWS could provide us which would be pertinent to our review of the license renewal application, including any listed, proposed, or candidate species that may occur within or near the project area, and any critical habitats that may occur near the project area. A map was enclosed indicating the location of the power plant site and the transmission line.

By letter dated November 19, 2001, USFWS replied to the staff request. The letter provided information on the presence of species which are federally listed, or proposed for listing, as endangered or threatened within the project area in accordance with Section 7 of the Endangered Species Act. The bog turtle was identified in the letter as a species of interest.

By letter to Ms. Bonnie Crosby, USFWS, dated January 17, 2002, the NRC staff requested FWS concurrence with staff conclusions which had been developed during the preparation of the environmental impact statement. The conclusions pertained to threatened and endangered species in the project area for the proposed license renewal of the Peach Bottom Atomic Power Station and included "no effect" and "not likely to adversely affect" determinations for threatened and endangered species. Three species were identified: the bog turtle, the bald eagle and the swamp pink (a flower).

On April 17, 2002, USFWS replied to the staff's January 17, 2002, letter. FWS concurred with the staff conclusions concerning the bog turtle and bald eagle. The swamp pink was not mentioned in the FWS response. The FWS also included the statement that this correspondence was not to be construed as addressing potential FWS concerns under the FWCA.

As summarized above, the NRC staff was in communication with the USFWS as part of the agency's environmental review of this license renewal application. In addition, the Department of Interior was provided with a copy of the draft EIS and had the opportunity to comment on the license renewal. The Department's comments have been carefully considered by the NRC during the preparation of and included in the final EIS. Our examination of judicial precedent

concerning implementation of the FWCA indicates that an agency's satisfaction of its NEPA obligations automatically satisfies the requirements of the FWCA. We believe that our activities have met our NEPA obligations and, thus, have satisfied the FWCA.

A.1.15 Comments Concerning Category 2 Transmission Line Issues

Comment: Section 4.2.1 – Electromagnetic fields, acute effects. – Are there any considerations for anticipating what would trigger a concern for future effects during the license renewal term? For example, if additional transmission lines are added in the area will it change the conclusion of this section. (PBD22-8)

Response: *Section 4.2.1 of the GEIS concluded that acute effects from electromagnetic fields from the power lines at the Peach Bottom site are small. This conclusion was reached after calculation results showed the induced effects were below the standards established by the National Electric Safety Code (NESC). The conclusion is consistent with the current scientific data and studies on effects from power line electromagnetic fields. If additional power lines were to be constructed during the license renewal period, consideration would be given to engineering designs such that the collective induced effects from the power lines would still remain below the NESC standards. There was no change in the SEIS text.*

A.1.16 Comments Concerning Category 2 Socioeconomic Issues: Historic Resources

Comment: Pg. 4-36/24-25 "The applicant should reflect the aforementioned in its licensing basis commitments and…" comment not applicable to issue. (PBD18-16)

Response: *The text has been changed to remove the reference to licensing basis commitments*.

Comment: A letter dated September 9, 2002, from the Delaware State Historic Preservation Officer (DE SHPO) is included in this appendix. In this letter, the DE SHPO made several comments.

Comment: The Atomic Energy Commission might not have met National Historic Preservation Act Section 106 responsibilities when it made its early 1970s decisions to grant operating licenses for Units 2 and 3 at Peach Bottom. (PBD19-1)

Response: *The NRC staff carefully reviewed the records and found that the Atomic Energy Commission (AEC) met the compliance standard for historic preservation consideration when the AEC made its decisions to issue the initial operating licenses for Peach Bottom Atomic Power Station, Units 2 and 3 (PBAPS).*

The original regulations, implementing Section 106 of the Act (36 CFR 800), were promulgated in 1979, five years after the NRC granted the original licenses for operation of Units 2 and 3 at Peach Bottom Atomic Power Station. The Advisory Council on Historic Preservation had no prescribed regulatory process for Federal agencies to demonstrate compliance with National Historic Preservation Act Section 106 responsibilities until 1979.

As required by Section 106, in 1972 the AEC provided information on the proposed action for PBAPS, including information on historic and archeological resources and determinations, to the Advisory Council on Historic Preservation with a request for comment. There is no record to indicate that the Advisory Council on Historic Preservation objected to the AEC's determinations.

The feeder canal, now identified as a historic property by the DE SHPO, was documented in September 1974, after the AEC issued the operating licenses. The NRC was not aware of the feeder canal until informed by the DE SHPO's office in 2001.

Comment: The proposed license renewal is a Federal undertaking with the potential to affect historic properties. (PBD19-2)

Response: *The NRC staff agrees.*

Comment: The feeder canal is a historic resource that meets standards for listing on the National Register of Historic Places. (PBD19-3)

Response: *Without taking a position in agreement or disagreement with the DE SHPO, the NRC staff considered the canal as though it were a historic resource potentially eligible for listing on the National Register for the limited purpose of addressing the DE SHPO's interests.*

Comment: Operation of the PBAPS under the current license has caused adverse effects on the feeder canal at the transmission line crossing. (PDB19-4)

Response: *Operation and maintenance of the Peach Bottom-to-Keeney transmission line was not the cause of past adverse effects on the feeder canal at the transmission line crossing. The utility corridor at the intersection with the feeder canal is approximately 400-feet wide; it is the same width as it was in 1968, well before the Peach Bottom line was added to the corridor. Three other overhead transmission line easements, and at least one underground utility easement share the corridor at the crossing. An NRC decision to either approve or deny the license renewal applications for PBAPS would not alter maintenance practices along the Delaware portion of the Peach Bottom-to-Keeney transmission line; maintenance would continue the same with or without the use of an easement on the corridor for the Peach Bottom-to-Keeney transmission line. The licensee does not own the land at the corridor crossing of the feeder canal nor does it have maintenance responsibility for the corridor at the crossing. The corridor is clear of trees, but is grass and brush covered, and has been in a similar condition since before the Peach Bottom-to-Keeney transmission line was constructed. A gravel-surfaced*

utility road meanders through the corridor and crosses the remnant trench for the feeder canal underneath the Peach Bottom line, but is not exclusively for maintenance of the Peach Bottom-to-Keeney transmission line. The access road that crosses the feeder canal replaced previous fords in the area of the corridor dating back to as early as 1937.

The old feeder canal alignment remains a visible and well-defined feature along much of its original route through present-day woodlands. It displays less definition and more in-filling as it passes under the transmission corridor. The changes under the transmission corridor are cumulative effects from a range of human and natural activities that extend back in time to a period well before the addition of the Peach Bottom-to-Keeney transmission line to the utility corridor.

NRC team review of aerial photographs indicates the feeder canal remained relatively intact until after 1968. At that time, and before 1977, small noticeable changes began to occur and continue today. First, a utility road crossed the feeder canal at a new place in the transmission corridor and below the present-day Peach Bottom-to-Keeney transmission line. Second, a series of cumulative changes began then, and continue to the present. These include gradual loss of vegetation along the alignment of the canal and a progressive loss of sharpness in the features of the canal as viewed from the air.

The license renewal process for Peach Bottom Units 2 and 3 is an undertaking and is subject to the regulations of the Advisory Council on Historic Preservation. The Chesapeake and Delaware Feeder Canal (Feeder Canal, which the transmission line connecting Peach Bottom Units 2 and 3 with the Keeney substation bisects, is not beyond the area of potential effects of the license renewal. Ownership or control of the lines does not limit the consideration of whether to include the property within the area of potential effects because such a limitation would hamper identification and consideration of the type and degree of undertaking effects on historic properties. Also, when there is a disagreement between a federal agency and a State Historic Preservation officer with regard to the eligibility of a particular property as historic, it is the federal agency's responsibility to seek a formal determination of eligibility from the Secretary of Interior. The DE SHPO contends this has not been done. And, the Feeder Canal, which may be eligible for listing on the National Register of Historic Places has and is subject to future damage or destruction due to lack of adequate maintenance of the transmission line. The loss of physical features, and the in-fill of the Feeder Canal where it is crossed by the transmission line, constitutes adverse effects due to destruction and neglect. (PBD19-5)

Response: *The NRC staff has determined that the Delaware portion of the Peach Bottom-to-Keeney transmission corridor is outside of the Area of Potential Effects (APE). Notwithstanding any representations made by NRC applicants, the Agency official (the Director, Office of Nuclear Reactor Regulation) has determined that the APE for a license renewal action is the area at the power plant site and its immediate environs which may be impacted by post-license renewal land disturbing operation or projected refurbishment activities associated with the proposed action. The APE may extend beyond the immediate environs in those instances where post-license*

renewal land disturbing operations or projected refurbishment activities specifically related to license renewal of the nuclear power plant potentially have an effect on known or proposed historic sites. This determination is made irrespective of ownership or control of the lands of interest.

For the proposed PBAPS license renewal, the licensee has stated, and our review has shown, that there will be no major structural modifications, that maintenance activities will be confined to previously disturbed areas, and that there will be no additional land disturbance. Further, the NRC staff has determined that the decision to approve or deny the requested license renewals would not affect maintenance practices or land disturbances beyond the substations at the PBAPS site where the generating units are connected to the distribution system. Therefore, the APE for the proposed PBAPS license renewal is the plant site, which is wholly within the Commonwealth of Pennsylvania. The PBAPS APE does not extend into Maryland or Delaware. In its letter of December 14, 2000, the Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation (the State Historic Preservation Office), determined that National Register-listed, eligible, historic, and archeological resources are present in the general vicinity of the PBAPS site, and stated an opinion that the proposed license renewal will not affect any of those resources. The NRC staff agreed with this determination and opinion. Therefore, consultation was not required.

Regarding the degraded portion of the feeder canal, where it crosses the transmission line corridor in Delaware, the NRC staff included this site in its review of environmental resources of interest as the staff prepared its environmental impact statement (EIS) to comply with the National Environmental Policy Act (NEPA). The NRC staff review included a visit to the canal during the staff's PBAPS site audit in November 2001. The staff disclosed its NEPA findings in its Draft Supplemental Environmental Impact Statement (SEIS) issued for public comment on July 5, 2002.

The NRC staff has determined that, even if the APE were to be extended through Maryland to the Delaware portion of the Keeney transmission line corridor, the proposed renewal of the PBAPS operating licenses would have no effect on the feeder canal where it crosses the Peach Bottom-to-Keeney transmission line corridor.

Comment: In correspondence received during the scoping period, The DE SHPO also stated that the NRC staff should consider three specific actions to take into account the effects of the undertaking to grant the license renewals for PBAPS. (PDB19-6)

Response: *The DE SHPO requests fall into two categories: (1) an action suggested with the intent to correct the perceived negative result of past operations, and (2) specific actions to prevent future deterioration of the feeder canal. The NRC staff forwarded the recommendations to the applicant in correspondence dated November 26, 2001, even though the recommended actions have no direct bearing on the undertaking.*

For the license renewal period, the applicant indicated that it plans (1) no major structural modifications, (2) to limit maintenance activities to previously disturbed areas, and (3) no additional land disturbance. Consistent with the NRC's "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437), under such conditions, the NRC staff believes continued operation of PBAPS would have no effect on any known or on potential unknown or undiscovered historic or archaeological resources located in areas of potential effect.

As part of its consideration of the DE SHPO correspondence, the NRC staff completed a supplementary analysis based on a scenario which postulated the inclusion of the Delaware portion of the Peach Bottom-to-Keeney transmission line corridor in the National Historic Preservation Act Area of Potential Effect. In that supplemental analysis, the NRC staff applied the criteria of adverse effect pursuant to 36 CFR § 800.5(a)(1) and found that the proposed undertaking to extend the PBAPS licenses would not alter the characteristics of the potentially historic property known as the Chesapeake and Delaware feeder canal. This conclusion followed consideration of DE SHPO views concerning such effects and incorporated analyses of past, present, and potential future conditions.

A.1.17 Comments Concerning Decommissioning Issues

Comment: The draft Supplement 10 contains an evaluation of partial or total decommissioning of existing facilities as the alternative to relicensing. Such analysis should answer at least the following additional questions: How would contaminated facilities and unused or spent fuel be disposed? How would the project sites be reclaimed? What would be the consequences for fish and wildlife resources and their habitat at both the former project sites and disposal area? (PBD21-6)

Comment: Evaluate the potential consequences of decommissioning (contaminated facilities and unused or spent fuel disposal, reclaiming project site, consequences for fish and wildlife resources and their habitats at former project sites and disposal areas) in the alternatives analysis for relicensing. (PBD21-24)

Response: *As described in Section 7 of the SEIS, environmental issues associated with decommissioning which result from plant operation during the renewal term are discussed in the GEIS. Decommissioning issues applicable to Peach Bottom Units 2 and 3 include radiation doses, waste management, air quality, water quality, ecological resources, and socioeconomic impacts. During its review of the license renewal application, the staff did not identify any new and significant information beyond that which is in the GEIS. For all of the applicable issues related to decommissioning, the staff concluded in the GEIS that the environmental impacts are SMALL, and additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted. The comments provided no new and significant information. Accordingly, there was no need to change the SEIS text.*

A.1.18 Comments Concerning Alternatives to License Renewal

Comment: But to replace nuclear power with solar power, you are telling me has a large environmental impact. Quite amazing. How can you say this and get away with it? (PBD13-1)

Response: *The LARGE environmental impact has to do with the potentially large scale of land and other resources required for the amount of solar panels necessary to replace 2186 MW(e) at Peach Bottom. NUREG-1437 reports that 14,000 ha of solar panels are required to generate 1000 MW at 7% conversion efficiency, so to replace Peach Bottom's capacity would require 30,000 ha, or about 3.3 billion square feet. That is 306 km^2 (118 mi^2), if placed on the ground, resulting in the loss of the land for other uses. Rooftop applications could reduce the impact but, would require the equivalent of 80% of all commercial building rooftops in the Mid-Atlantic Census Division (all of Pennsylvania, New York, and New Jersey).*

Staff inquiries to the National Renewable Energy Laboratory yielded a current average commercially available conversion efficiency of perhaps 10% today, 25% availability, and a lower overall requirement for land (approximately 8,000 ha per 1000 MW), which reduces the figures to 175 km^2 and 1.9 billion square feet of rooftop by about one-half. However, even if efficiency of solar panels increases substantially from today's levels, a large amount of land or rooftop space still would be required for the necessary solar arrays. If the panels were mounted on greenfield sites rather than rooftops, the impact on ecological resources could also be substantial.

Minor changes were made to the SEIS to clarify the staff's conclusions.

Comment: The amount of solar energy striking Pennsylvania each year is 140 times greater than all the electrical and fossil fuel energy consumed in the state annually. Even it the conversion efficiency of sunlight to energy is only 5 percent, solar energy could still supply 7 times more energy than is consumed. (PBD13-9)

Response: *The overall supply of solar irradiance on Pennsylvania is not in dispute. Chapter 8 deals with the question of environmental and cost requirements to exploit this solar energy for electricity. No changes were made to the SEIS as a result of this comment.*

Comment: So when I read that the environmental impact of replacing nuclear energy with solar power was large, and the impact of continuing Peach Bottom for 20 more years was small, I was totally blown away. (PBD13-10)

Comment: I wonder where you got all your information from? The numbers that are cited have NRC in parentheses. Since when is the Nuclear Regulatory Commission experts on solar energy? (PBD13-11)

Response: *The NRC document is NUREG 1437, the Generic Environmental Impact Statement for License Renewal of Nuclear Plants. Chapter 8 of that document reports the results of an extensive exercise by staff at the Oak Ridge National Laboratory to characterize the technical performance and environmental impacts of a large number of energy generation technologies, including solar. Recent contacts with the staff of the National Renewable Energy Laboratory*

solar energy program lower the amount of land necessary to replace the Peach Bottom plant with solar photovoltaic panels but do not invalidate the LARGE land impacts stated in Section 8.2.5.3.

Comment: The draft report notes the socioeconomic problems associated with the shutdown and decommissioning of Peach Bottom. However, if a power plant were to operate around the same area, using renewable resources, such a plant would need a large number of employees who would probably be just as involved in the community as the current Peach Bottom employees. (PBD16-12)

Response: *Chapter 8 discusses the socioeconomic impacts of replacement power plants. Generally speaking, replacement plants would require fewer long-term employees than Peach Bottom. In addition, the local community would experience the impacts associated with constructing the replacement plant or plants. No changes in the SEIS text were made as a result of this comment.*

Comment: You said there were places that would be good for wind, but it would be inaccessible. I can't imagine any place being inaccessible, when you think of where all the high tension utility wires are going through right now. It almost looks like it would be inaccessible and yet they are there. What place in Pennsylvania would be inaccessible for wind? (PBD03-2)

Comment: Now, in this report, under wind, it mentioned that ridge lines are unsuitable for wind resources. Now, that is the most ridiculous thing I have ever heard. (PBD14-15)

Response: *The best wind resources in Pennsylvania are along ridge tops in the steeper parts of the Allegheny and Appalachian Mountains (see, for example, the Pennsylvania Wind Map available from the Pennsylvania Department of Environmental Protection (http://www.dep.state.pa.us/dep/deputate/pollprev/energy/wind/windmap.htm). The largest wind generators are likely to be 1 MW to 1.5 MW units, so about 1500 to 2200 wind towers would have to be installed to replace Peach Bottom capacity. Since wind is an intermittent resource (perhaps 30percent to 35percent availability), three to four times this number would be needed to replace the kWh generated by Peach Bottom.*

Accessing many of the best wind energy ridgelines would require extensive road building, as well as land clearing (for tower and blades) and leveling (for the tower bases and associated facilities) in very steep terrain. While not impossible, this is expected to be very costly, so many of the ridgelines with good wind resources may be inaccessible from a practical standpoint. Also, some of these areas are not already developed as farmland. They are in state parkland or not near transmission lines or would require clearing forested land. No changes were made to the SEIS as a result of these comments.

Comment: When, indeed, there are available other much cleaner, much cheaper, much more durable sources to generate the electricity, the energy that we need. (PBD05-4)

Response: *The other alternatives are considered in Chapter 8.0 and in NUREG 1437, Chapter 8. Although relative cost is an issue for the applicant, state energy regulators, and the marketplace to resolve, the environmental impacts of the various alternatives to relicensing are*

not obviously less than those of the routine operation of the Peach Bottom Plant, and in most cases are considerably greater. While the durability of wind, solar, and water resources is theoretically greater than that of fossil and nuclear fuels, the durability of facilities to convert these resources to electricity is not. Need for energy is outside the scope of the relicensing EIS, since the renewed license only preserves the option to operate the plant.

No changes were made to the SEIS as a result of this comment.

Comment: There is plenty of wind along the ridge lines, and Exelon knows this, because community energy is going ahead and building large wind farms in Pennsylvania, some of them on ridge lines. Yes, they are deforesting some of them, and there are impacts. (PBD14-16)

Comment: There is a 60 megawatt wind farm going on line in Northeast Pennsylvania. Exelon is underwriting that. There are already two in Southwest Pennsylvania, Exelon underwrote those as well. There is another one going in, in West Virginia, in the Backbone mountain, another 60 megawatts. (PBD14-17)

Response: *The wind farms discussed are relatively small scale. Somerset is 9 MW, Mill Run is 15 MW, Pocono is 60 MW, Moosic Mountain is 50 MW. Backbone (in West Virginia) is 65 MW. Mountaineer (in West Virginia—due to open in the spring of 2003) is 66 MW. These are considered among the best sites in the Eastern United States. The replacement of Peach Bottom power would require an additional 36 wind farms of the size stated for the West Virginia site or replicating the entire existing Exelon wind resource 12 times to produce the necessary generating capacity, and 40-45 times to generate the replacement kWh because of the 30-35 percent capacity factor for wind energy. Wind energy cannot be used as base load power since capacity factors are in the mid-30-35 percent range. Based on figures available in the NUREG-1437, Chapter 8, the amount of land dedicated to wind facilities would be about 61 ha (134 ac) per MW based on the Altamont Pass, California facility.*

Based on the latest Storm Mountain proposal in West Virginia, the land needed might be only 18 ha (40 ac) per MW. Even this lower figure results in a need for 153 square miles of land to replace Peach Bottom capacity. Assuming a capacity factor of 30-35 percent yields 450-500 square miles dedicated to wind farms to replace Peach Bottom, clearly a large potential impact on land use and ecological resources.

Comment: And so the wind part of this report is woefully inadequate, it is scientifically inaccurate, it is just wrong, you need to do your homework. (PBD14-18)

Response: *Wind figures were double-checked (see answers to comments) and land requirements appear reasonable. See answers to PBD03-2 and PBD14-17.*

Comment: The head of the Department of Environmental Protection in Pennsylvania, David Hess, was actually quoted at the Energy Conference where that natural gas presentation was given, saying that using just the decent wind speed sites in Pennsylvania, we can supply 30 percent of our electricity needs in this state. Now, what he is quoting is from the American Wind Energy Association, which is using Department of Energy data, which is working on being

revised, it is not really that optimistic. However, 30 percent is pretty high. And even if it turns out to be 10 percent, that is very significant, and that needs to be addressed in this report. (PBD14-19)

Response: *The American Wind Energy Association report addresses wind potential in very general terms. While there are several wind farms in various stages of development by Exelon and others in Pennsylvania and nearby states to address increases in future demand (not replacement of currently operating plants) it would be necessary to increase in wind generating facilities by a factor of between 15 and 45 times current capacity in difficult terrain to replace Peach Bottom. Approximately 450 to 500 square miles of the best wind sites would be committed for this purpose, with accompanying land and environmental impacts. No changes were made in the text of the SEIS.*

Comment: And also, a lot of this is addressing section E, on A-48 you mention over 50 competitive suppliers in Pennsylvania. This report, again, needs to be updated. There were close to 50 when deregulation first hit Pennsylvania, that is before we had PPL doing the Enron-like games here. Since then competitors have fled as quickly as they can, we have very few suppliers that are left in this state right now, especially for the residential sector. For the business sector we have some, but it is still not looking that good. (PBD14-20)

Response: *According to the Pennsylvania Public Utility Commission website on September 30, 2002, there were 63 companies licensed to be competitive electricity suppliers in Pennsylvania (*http://puc.paonline.com/electric/elect_comp.asp*). No changes were made in the text of the SEIS.*

Comment: And also on that same page, on page 8-48, there is basically no incentive for Exelon to be pushing conservation in a competitive market. Well, yes, that is a problem, that is a problem with the whole system of having a competitive market for things, when the logic in this report is saying, Exelon is not going to do it, that is not going to happen. (PBD14-21)

Response: *The commenter appears to agree with the staff position that demand side programs are less likely in a competitive environment than in a regulated monopoly environment. No changes were made to the draft SEIS as a result of this comment.*

Comment: And that is, basically, the assumption that I saw in here because, otherwise, we can easily talk abut methods of conserving enough electricity, and without just looking back at their failed attempts as a utility to work as against their own economic interest. (PBD14-22)

Response: *Despite indications in section 8.2.5.11 that the environment for demand reduction would be difficult under competitive electricity supply regimes, staff assume in Section 8.2.6 that some additional electricity (half of the amount supplied by Peach Bottom), can be conserved, with the rest supplied by natural gas combined cycle generation. The amount conserved in this scenario is 8.2 GWh, the equivalent of 20percent of all Pennsylvania households' annual electricity consumption or 37 percent of all PECO electricity sales in Pennsylvania in the same year. No changes were made to the draft SEIS as a result of this comment.*

Comment: So the whole no-action alternative, the wind, the solar estimates, the conservation efficiency estimates completely need to be rewritten. (PBD14-24)

Response: *Minor changes to text have been made to elaborate on Staff conclusions regarding the alternatives to relicensing Peach Bottom Units 2 and 3.*

Comment: The findings, the second reason is the findings of ongoing studies that show that fossil fuel plants emissions are considerably more damaging to the local health and welfare than previously thought. (PBD10-2)

Response: *While the SEIS presents information on the impact of relicensing and its alternatives, it is unclear from the comment what was "previously thought" concerning the effects of alternatives on local health and welfare. No changes were made as a result of this comment.*

A.1.19 Comments Concerning Out of Scope Issues: Operational Safety, Emergency Preparedness, Aging Management, Cost of Power, and Need for Power

Operational Safety and Emergency Preparedness

Comment: I found no mention of my request that past performance of the plant be taken into account, including control room operators sleeping on the job. (PBD16-2)

Comment: There was no mention of my comments about the problems with the emergency warning sirens. (PBD16-4)

Comment: "Two former contract technicians deliberately falsified siren testing maintenance records, and performed inadequate siren tests while professing that all activities on siren records were properly done. And, two, one of these technicians knowingly installed jumper wires to bypass failure detection circuitry on at least 10 siren boxes, which would demonstrate that the sirens were working properly, even if they were not." (PBD16-5)

Comment: Shouldn't the public be made aware of why Peach Bottom 1 was closed in 1987? It is true that the cause was operators were sleeping on the jobs, and taking drugs? Where are the records published about the plant violations, such as those in 1982, '83, and the death of an employee in 1985? (PBD08-4)

Response: *The comments are noted. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. Operational safety is outside the scope of this review. An NRC safety review for the license renewal period is conducted separately. Although a topic may not be within the scope of review for license renewal, the NRC is always concerned with protecting health and safety. Any matter potentially affecting safety can be addressed under processes currently available for existing operating licenses absent a license renewal application. The comments provide no new information, and do not pertain to the scope of license renewal as set in 10 CFR Part 51 and Part 54. Therefore they will not be evaluated further.*

Comment: This idea that people will evacuate under some sort of system is completely baseless and irrelevant. There has been reports that come from the accident at Three Mile Island, whereas earlier the doctor mentioned about not having adequate physicians, and people to use in the evacuation. Will they be around? (PBD12-3)

Comment: This has been determined that nuclear accidents are not the same as natural disasters. People who are responsible, who want to be, the system relies for their jobs to show up, will not show up. (PBD12-4)

Comment: And what is going to happen if a nuclear evacuation is called? There is going to be spontaneous evacuation outside the ten mile EPZ, further jamming up the highways, and making it impossible for anybody to get out. (PBD12-5)

Comment: So as I always say at these hearings, when I go to them, is that the least you can do is to tell the people to stay put in their houses. (PBD12-6)

Comment: Somebody else is talking about how we will evacuate. I live next door to an amish family, lots of buggies here, lots of buggies. Very dangerous, normally, on route 74 with those buggies. I can't imagine evacuating all the people from this area. (PBD13-7)

Comment: There is no way that anybody escapes out of a ten mile EPZ safely, within a certain amount of time. (PBD12-1)

Comment: If nukes are so safe why do our phone books have an evacuation route, why is the industry trying to figure out where to dump their deadly waste, and why is 46,000 dollars of your country's budget, our money, going yearly to radiation emergency response? (PBD03-18)

Comment: I've never seen any evacuation plant for the Amish. (PBD16-1)

Response: *The comments are noted. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. Emergency preparedness is outside the scope of this review. An NRC safety review for the license renewal period is conducted separately. Although a topic may not be within the scope of review for license renewal, the NRC is always concerned with protecting health and safety. Any matter potentially affecting safety can be addressed under processes currently available for existing operating licenses absent a license renewal application. The comments provide no new information, and do not pertain to the scope of license renewal as set in 10 CFR Part 51 and Part 54. Therefore they will not be evaluated further.*

Comment: Are Emergency Planning and Community Right to Know (EPCRA) 313 reporting requirements considered or are any of the EPCRA requirements applicable to this supplement. (PBD22-2)

Response: *The supplemental environmental impact statement (SEIS) considers the environmental impacts associated with renewing an operating license for up to 20 years beyond the current operating license expiration date. Renewal of the Peach Bottom Units 2 and 3 operating licenses does not, by itself, alter the applicability of EPCRA reporting requirements already in effect prior to the time the license renewal is issued. Therefore, EPCRA reporting requirements are not applicable to this SEIS.*

Comment: KI must be given to all the populations within at least 50 miles of the plant. (PBD12-7)

Comment: The social consequences of a nuclear evacuation has been underplayed and on the side line for the last 30 years. It really has come to fore because of 9/11, and now the redistribution of potassium iodide tablets. (PBD12-2)

Comment: The NRC would also have to stockpile iodine pills in schools, day care centers, places of work, and so forth. Soaring rates of thyroid cancer are still appearing in children from the former Soviet Union, who were exposed to Chernobyl nuclear accident, and who received too little potassium iodine, and too late. (PBD03-13)

Response: *The NRC has made potassium iodide available to States that wish to include thyroid prophylaxis in their range of public protective actions to be implemented in the event of a serious accident at a nuclear power plant that would be accompanied by a release of radioactive iodine. The Commission issued a Final Rule on potassium iodide in the Federal Register on January 19, 2001 (66 FR 5427), which includes the Rule, a statement of considerations, and responses to public comments received during the rule-making process.*

Aging Management

Comment: We have been following the issue of there are a whole host of issues, particularly with regard to age related deterioration of the reactors. And the vulnerability of some of the materials that make up the reactor are being evaluated 10, 12 years in advance of the issuance of the license. And what we are seeing is that by and large there are more uncertainties with regard to how cracks grow, how they initiate, how quickly they can grown up to failure. (PBD01-1)

Comment: Vent containment to save it. A botched design, a proposed ban by its own safety officials. Its primary containment system later verified to have an irreversible design flaw. A principal safety boundary jury rigged, and Peach Bottom was given its first new lease on life with significant reduction of its often touted defense in depth hardware and philosophy. Today these badly designed and deteriorating reactors are being re-licensed for an additional 20 years only if increased risk of adverse environmental impact to our safety, and the economy, and the water, and the land resources. (PBD01-7)

Comment: My name is Frieda Berryhill, and I'm concerned with this aging management program because we had a lot of problems with the cracks and embrittlement in the nozzles, particularly. (PBD02-1)

Comment: To make my point, cracks and leaks, and embrittlement of the material of the materials in aging plants is well known by the NRC. (PBD02-4)

Comment: And, again, after extension the nozzle cracks were discovered. And earlier this year Quartz City in Illinois reported a problem with those. And that is a dangerous problem with those. And that is a dangerous problem. (PBD02-5)

Comment: Although I'm angered that this old nuclear plant is even up for the license renewal, the NRC's own standards stated Peach Bottom was supposed to close 30 plus years ago. What has changed? Has anyone from the NRC personally inspected every piece of rusty metal, worn parts, fractured cement? There is no way Peach Bottom can operate safely, or economically, and should be shut down, according to the Nuclear Regulatory Commission's own figures. (PBD03-3)

Comment: We don't know what a 40 or 50, or 60 year nuclear plant will be like; will the plants wear out mechanically? (PBD06-2)

Comment: So it is clear here that we need to see more in terms of what would happen in terms of an aging plant, and in terms of a possible accident. (PBD06-3)

Comment: It is – maintenance is a continual problem. (PBD08-6)

Response: *The comments are noted. The NRC's environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant. Safety matters related to aging are outside the scope of this environmental review. To the extent that these comments pertain to managing the effects of aging on components and structures specified in 10 CFR 54.21 during the period of extended operation to ensure functionality, they will be addressed in the parallel safety review. The comments provide no new information and will not be evaluated further in the context of the environmental review. However, the comments will be forwarded to the project manager for the license renewal safety review for consideration.*

Cost of Power

Comment: The production of nuclear power is extremely energy intensive. The energy consumed by future needs, such as shipping 77,000 tons of nuclear waste all over the country, much more being produced, this doesn't even figure into the calculations. (PBD02-6)

Comment: Everything from the insurance that Peach Bottom has that all nuclear power plants have is paid for by me, the taxpayer, through the federal government. (PBD13-2)

Comment: The other thing is we fund the nuclear regulatory industry through our taxes. I don't know how much you all make, but I bet it can buy a lot of solar panels. (PBD13-3)

Comment: Let's see, Yucca Mountain. If you decide to put that waste at Yucca Mountain how much are you planning on spending to do that? How much do you spend in regulation and cleanup from the mining of uranium? I mean, you put all that money together, it can buy a hell of a lot of solar panels. (PBD13-4)

Comment: It is estimated that over 50 billion dollars per year is spent by the Federal Government in directly subsidizing the costs associated with fossil and nuclear fuels. (PBD13-5)

Comment: These costs do not show up in the price we pay for energy, but we pay for them just the same. We pay for them in our tax dollars, we pay for them with our lives, in cancer. If these hidden costs, often referred to as externalities, were included in the price we pay for energy, then solar energy would be in a far better position to compete with conventional fuels. (PBD13-6)

Comment: Why would the NRC renew the license of any nuclear plant, when it costs the public so much money to protect these facilities from terrorism? How long can we afford to absorb that kind of cost? (PBD09-4)

Comment: What kind of debt would we be planning to leave for our children, and their children, just for the constant surveillance of nuclear plants? (PBD09-5)

Comment: Why do our tax dollars have to pay for Peach Bottom, a private company, hazardous operation? (PBD03-14)

Comment: Is Peach Bottom required to put up a bond and for how much? Is there any insurance for an accident, and what amount of insurance? (PBD03-4)

Comment: What will happen if and when the plant becomes so unsafe that our land values go down and we can no longer live here? (PBD03-5)

Comment: Will the owners of Peach Bottom go into bankruptcy, like Enron? What will happen, who will pay for all this? (PBD03-6)

Comment: How much disaster insurance does Peach Bottom carry for York County? We have a right to know. Are you going to pay for our land when it becomes useless? What will happen? (PBD03-12)

Comment: But the big concern that I have here is the future generations. We are talking 250,000 years of financial indentured servitude. Because the Exelon Corporation is not going to pay for the maintenance and the overhead costs of this facility for 500 years, 1,000 years, and so on. Who is going to do it? It is our children, and our grandchildren, and or great-grandchildren, and countless future generations. (PBD04-3)

Comment: I don't know if they are in bed with Enron, but I tell you what, Exelon, when they are done with it, probably already has secret plans to simply go bankrupt And when they do, who pays the bill? (PBD04-4)

Comment: Third, renewal of Peach Bottom's license is far more economical than building a new power plant. (PBD07-5)

Comment: Well, building on the economy of scale that would be less than a billion dollars, 6 to 700 million dollars, will bring the cost of solar panel production down by four to five times, so that is cost effective with other forms of electricity generation. (PBD14-25)

Comment: And when I say cost effective I'm talking about cost effective with the subsidized, and not real cost that nuclear reactors are currently getting because nuclear reactors are currently getting, because nuclear reactors aren't cost competitive either, that is why they are so heavily subsidized. (PBD14-26)

Response: *The comments are noted. The economic costs and benefits of renewing an operating license are specifically directed to be outside the scope of license renewal in 10 CFR 51.95(c)(2). The comments provide no new information and, therefore, will not be evaluated further. There were no changes made to the SEIS.*

Need for Power

Comment: We export so much electricity, I know it is not done on a state by state basis, but how much is generated versus used in each state? Pennsylvania is the largest exporter. (PBD14-10)

Comment: Now, on top of that excess capacity, Pennsylvania has been faced with 50 to 70 new natural gas power plants. One of them right here in the Peach Bottom area. Now, these power plants, first of all, just the one here at Peach Bottom would be at least half as large as the reactors that are already here. So half the capacity could, theoretically, if they build this plant, be shut down. (PBD14-11)

Comment: But even the ones that are likely to go through is more than 10,000 megawatts. Meaning we can not only shut down Peach Bottom, both units, we can shut down all the nukes in Pennsylvania, and no one's lights are going to go out, no one is even going to notice. (PBD14-12)

Comment: The mid-Atlantic region generating capacity in 2001 through '3, you have approximately 20,000 megawatts, maybe a little less than that, being added, according to this. Now, PJM has a lot more than that. But even in the lower end of these two estimates you have twice as much of all the nuclear capacity in Pennsylvania being filled, mostly by natural gas, in the next few years. So the no-action alternative already says that this power is getting replaced, whether you like it or not. (PBD14-13)

Comment: Earlier in the presentation today it was explained that the reason that is being done twelve years in advance is to give Exelon time for replacement power. Now, that is ridiculous because it is already getting replaced, so that is not a legitimate argument. The replacement power time frame that is needed, even if there was a need for replacing this specific reactors power, could be done within two to three years, because that is the time frame for establishing wind, and/or natural gas, both power plant technologies take only a few years. (PBD14-14)

Comment: And, finally, page 8-49, the very first few lines it says, therefore it is not clear whether Exelon or another competitor supplier will construct new generating units to replace Peach Bottom units 2 and 3 if the license were not renewed. Again, you are getting at this idea that you have no idea what is going on currently, or if you do, you are not writing it into this report. This power is already being replaced. (PBD14-23)

Response: *The comments are noted. The need for power is specifically directed to be outside the scope of license renewal in 10 CFR 51.95(c)(2). The comments provide no new information and, therefore, will not be evaluated further. There were no changes made to the SEIS.*

A.1.20 Editorial Comments

Comment: Pg. 1-11 / 4,7 "Excelon" typo – correction "Exelon (PBD18-1)

Comment: Pg. 2-7 / 18 "The operation is infrequent" should say "This dredging operation is" (PBD18-2)

Comment: Pg. 2-7 / 29, 32, 34 "rocket" correction required "This term should be deleted (PBD18-3)

Comment: Pg. 2-6 / 25 "Conowongo" typo – correction required "Conowingo" (PBD18-4)

Comment: Pg. 2-11/17 “water storage tank” should say “water storage tank, and Torus dewatering tank. (PBD18-5)

Comment: Pg. 2-19/12 “…uses an ammonium chloride-based molluscide” verbiage should state “uses an Quaternary-amine-based molluscide” (PBD18-6)

Comment: Pg. 2-21/ 38 “…a consortium of Federal regional… rephrase wordage “a consortium of utilities and Federal, regional,…” (PBD18-7)

Comment: Pg. 2-37/ 8 “emission stacks” change word usage to “emission stack” (PBD18-8)

Comment: Pg. 2-37/8 “There is no visible plume” should read “There is no visible vapor plume…” (PBD18-9)

Comment: Pg. 2-43/24 “and railroads) were change word usage to “and railroads, etc.) were” (PBD18-10)

Comment: Pg. 2-47/39 “NRC is consulting with the FWS” change word usage to “NRC has consulted with the FWS” (PBD18-11)

Comment: Pg. 4-15/13 – 15 “The designed operation criteria are maintained in part by removal of sediments that are deposited in the canal. Maintenance of the designed depth for the intake canal helps ensure that approach velocities at the screens meet criteria. Delete text “These sentences should be deleted” (PBD18-12)

Comment: Pg. 4-15/19 “NPDES Permit PA00097733” correction required “NPDES Permit PA 0009733” (PBD18-13)

Comment: Pg 4-17/9 “Five mechanical draft cooling towers” correction required “Three mechanical draft cooling towers are located on berms…” (PBD18-14)

Comment: Pg. 4-34/33 “Hisroric” typo – correction required “Historic” (PBD18-15)

Comment: Pg. 4-36/26 “…not have an effect effect on any…” remove duplicate “…not have an effect on any…” (PBD18-17)

Comment: Pg. 4-36/35-36 “Given the commitments of the applicant to avoid future disturbances and to control access to lands it manages…” modification to original understanding as stated “Given the commitments of the applicant to limit land disturbances in support of license renewal…” (PBD18-18)

Comment: Pg. 4-38/6-10 "The listing of counties is not correct." Correction – proper information "For counties entirely in the 50 mile zone, delete Kent County DE, and add New Castle County DE. For countless partially in the 50 mile zone: add Kent County DE." (PBD18-19)

Comment: Pg. 4-38/22 "…criteria, Table 4-8 indicates…" correction – proper graphic "…criteria, Figure 4-1 indicates…" (PBD18-20)

Comment: Pg. 4-39/Map "Maryland Counties include Kent and Queen Annes." Typo/proper information "Maryland Counties include Queen Anne but not Kent" (PBD18-21)

Comment: Pg. 4-45/30-31 "…and its independent analysis, and pending the outcome of consultation with the FWS, it…" revise statement "…and its independent analysis, it…" (PBD18-22)

Comment: Pg. 4-45/34-35 "Therefore, it is the staff's preliminary determination…" revise statement "Therefore, it is the staff's determination…" (PBD18-23)

Comment: Pg. 4-48/38 "BEIR" correction required – spelling of acronym "Biological Effects of Ionizing Radiation (BEIR)" (PBD18-24)

Comment: Pg. 4-51/13 "isptope…" typo – correction required "isotope" (PBD18-25)

Comment: Pg. 4-51/35 "Considerable of technical literature" rephrase sentence to read "A considerable amount of literature" (PBD18-26)

Comment: Pg. 4-58/12 "Units w and E…DPR44 and Dpr-56 typo – correction required "Units 2 and 3…DPR-44 and DPR-56" (PBD18-27)

Comment: Pg. 6-6/17-21 and 6-8/29-30 "On February 15, 2002, subsequent to the…This change in regulatory status does not cause the staff to change its position…" status change to "On July 23, 2002, the President signed into law House Joint Resolution 87 designating Yucca Mountain as the repository for spent nuclear fuel." (PBD18-28)

Comment: Pg. 8-38/37 "…construc-tion…" typo – correction required "…construction…" (PBD18-29)

Comment: Pg. 8-55/7 "Pennsylvania Power & Light Company (Exelon)" typo – correction required "Exelon Generation Company LLC (Exelon)" (PBD18-30)

Comment: Pg. F-2/24 "A.1" correction "F.1" (PBD18-31)

Comment: I have read the above document and find the information content and its presentation to be clear and comprehensive, in response to the public needs regarding the license renewal process. All major regulatory requirements are noted and explained, in addition to specific responses to questions put forth during and after the general scoping meeting in November, 2001 in Delta, PA. Detailed coverage was given of all major environmental topics, including demographics, background operational data, and reasonable future activities. Current data that addressed specific health and operational concerns were presented, as requested by local residents and concerned citizens. Using risk management procedures, it was shown that any / all plant activities have minimal or small levels of risk to the environment or to human health. (PBD17-6)

Response: *The comments are noted. As appropriate, the comments resulted in modification of the SEIS text.*

Comment: Please elaborate on the term "staff" used frequently throughout the EIS. Specifically, the relationship of the Staff to the NRC and Exelon. (PBD22-1)

Response: *The term "staff" refers to the NRC staff and its contractors who participated in the environmental review and the preparation of the SEIS. The contractors were experts in selected environmental disciplines from Lawrence Livermore National Laboratory, Argonne National Laboratory, Pacific Northwest National Laboratory and Information Systems Laboratory. A listing of these experts is included in Appendix B of the SEIS. There is no organizational relationship between Exelon and the NRC staff and its contractors.*

Comment: Is there any information contained in document that is sensitive or classified, that should be removed or made available through different means? (PBD22-3)

Response: *There is no sensitive or classified information contained in the document that should be removed or made available through different means. Since September 11, 2001, the NRC staff has implemented a broad range of measures to strengthen the processes for protecting sensitive and classified information. One of these measures includes the establishment of a step in the SEIS pre-publication process which requires a review for the specific purpose of ensuring the published draft and final SEISs contain no sensitive or classified information.*

A.2 Public Meeting Transcript Excerpts and Comment Letters

Transcript of the Afternoon Public Meeting on July 30, 2002, in Delta Pennsylvania

[Introduction, Mr. Cameron]
[Presentation by Mr. Tappert]
[Presentation by Mr. Anand]

FACILITATOR CAMERON: Raj, let's see if there are some questions for you. And I just wanted you to clarify one thing before we go out to the audience.

You said the schedule was 25 months. Can you give people a specific target date, or month, for when this decision is supposed to be made?

MR. ANAND: The Commission plans to issue operating licenses for both units, units 2 and 3, in July 2003.

FACILITATOR CAMERON: You mean they will issue their decision on whether to renew the licenses?

MR. ANAND: Right.

FACILITATOR CAMERON: All right. You heard Raj talk about the overall process and, specifically, about the safety evaluation. We are going to go on to other subjects.

Are there any questions about the process at this point? Yes. And give us your name, please.

PBD01 0 1-1

MR. GUNTER: My name is Paul Gunter, and I'm with the Nuclear Information Resource Service in Washington.

We have been following the issue of -- there are a whole host of issues, particularly with regard to age related deterioration of the reactors.

And the vulnerability of some of the materials that make up the reactor are being evaluated 10, 12 years in advance of the issuance of the license. And what we are seeing is that by and large there are more uncertainties with regard to how cracks grow, how they initiate, how quickly they can grow to failure.

And, yet, this license proceeding is taking it, basically, approaching this issue of age related deterioration, 10, 12 years in advance of when this license will be necessary.

Can someone address, to us, why the license renewal proceeding is occurring 12 to 14 years, in some cases, before the license is actually to expire?

FACILITATOR CAMERON: Thanks, Paul. And I not only would like the NRC staff to answer that question, but I think the implication in Paul's question is between the time the decision is made on these license renewal applications, if there was an affirmative decision, how will the NRC monitor continued aging types of impacts after that point.

We are going to John Tappert.

MR. TAPPERT: All right. Yes, you are accurate, we do it often well in advance of the expiration of the license. Our regulations allow them to submit an application up to 20 years before the original license expires.

The reason for that is to allow them to make economic decisions if, in fact, the license is not renewed, to replace base-load power. I mean, there is a long lead time for those kinds of facilities.

What we are assessing is to make sure that they have aging management programs in place to identify cracking and to replace components as they are needed.

Additionally, just because the license is renewed doesn't mean they are exempt from regulatory oversight. If a mechanism has come to our attention, I'm sure you are familiar with the Davis-Besse head degradation event, that is an operating reactor issue, and we are dealing with that, with all of the entire fleet of PWRs, irrespective of whether they are coming into license renewal or not.

So we still have a variety of regulatory means to go out and do inspections, and request actions for the licensees to respond to aging management or any other degradation mechanisms.

FACILITATOR CAMERON: Okay, thank you John. Let's go to -- yes, ma'am?

PBD02 02-1

MS. BERRYHILL: My name is Frieda Berryhill, and I'm concerned with this aging management program because we had a lot of problems with the cracks and embrittlement in the nozzles, particularly.

Will this be managed centrally from Washington, or does each plant have a managing program concerning aging?

FACILITATOR CAMERON: That is a great question. Can we have someone talk about how the NRC headquarters and regions, in our regional office, divide up responsibility for not only the license renewal review, but continued aging management issues? Does someone want to try to handle that?

We are going to go to John.

MR. TAPPERT: The question is, is the program being run out of headquarters, and the regional offices?

MS. BERRYHILL: Centrally, yes. We cannot address our concerns due to aging because that is really the main problem that concerns us.

MR. TAPPERT: Yes. I would say headquarters is -- we are running the license renewal review out of headquarters. I'm out of headquarters, most of these gentlemen are also out of our headquarters office, and the office of nuclear reactor regulation.

And we are doing the reviews of the aging management programs to make sure that they are in place, and acceptable. The region has a role, they do inspections for us, they inspect to make sure that they are looking at the right components, and that they have appropriate programs in place.

They also have ongoing inspection activities at the plant. You may or may not be aware we have NRC employees stationed at the plant, around the year. And those are regional employees.

So all the inspection activity is coming out of the region, but this particular review is being run out of headquarters, and we have contact numbers that will be provided in the presentation, to get a hold of us.

MS. BERRYHILL: But aging managing is the new –

FACILITATOR CAMERON: We need to get everybody on the transcript, so let me bring this out to you if you have a follow-up question. If you could just repeat that question, the last one you asked for?

MS. BERRYHILL: Yes, aging management is a new department, do we have someone to address when something like this comes up?

FACILITATOR CAMERON: Absolutely. John, why don't you go up to that mike and I will stay out here.

MR. TAPPERT: Okay. The branch that I'm part of is called license renewal and environmental impacts. And one of the sections looks at aging management programs.

And Raj Anand is the safety project manager who specifically is overseeing that review. We are going to give you a bunch of names at the end. You can contact any of us, and we will get you in contact with the right person. Actually Dr. P.T. Kuo is the one who is actually heading our organization.

FACILITATOR CAMERON: Thanks, John. And I would just emphasize, when we are done with the meeting today, please take the opportunity to talk to the NRC staff that are here, they will try to be helpful with questions.

And I think we do have some of our regional staff here, today, too. Let's go to this gentleman, and then we will go over here.

MR. NELSON: Allan Nelson, NEI. I would just like to respond a bit to the woman's question, if I may.

The NRC has developed a document called Generic Aging Lessons Learned, where it takes into all the operating experience that have occurred up to April 2001. From that point on it is up to the NRC, and the licensee, to evaluate any aging lessons learned that can take place from that time forward, and incorporate it into its license.

And then as part of its ongoing program continue to evaluate operating lessons learned, and implement those into their program, as they see fit for that particular licensee.

FACILITATOR CAMERON: Thanks, Allan, for that additional information. Let's go to you.

MR. SILVER CLOUD: Rutisa Lugisky, here locally. That is Silver Cloud in the English language. The question I have, has any forethought been given to 500 years, 1,000 years from now, as to the aging management thing? Honestly, has anyone thought that far out?

FACILITATOR CAMERON: Okay, thank you Silver Cloud. And I'm not going to try to say the Cherokee word for your name, for obvious reasons.

John, Raj, you heard the question, and it deals with continual evaluation. And do you have something for Silver Cloud?

MR. TAPPERT: This particular review that we are doing now is to relicense the plant for an additional 20 years. So the focus is to have aging management programs to cover that period of time.

When you are talking to these longer time frames, it is not so much this particular facility, which will not be operating in those times, but there will be a geological repository to handle the spent fuel waste, and those areas we do look at those kinds of time frames.

FACILITATOR CAMERON: When this license, if this license is renewed, it will be renewed for a specific period of time. Can you just tell people, you or Raj, what that renewal period is?

MR. TAPPERT: Right. The current expiration is 2013 and 2014, they will be adding another 20 years to that, 2033 and 2034.

FACILITATOR CAMERON: Thank you very much. Any other questions on this part of the process, before we go to the environmental?

(No response.)

FACILITATOR CAMERON: Okay, thank you very much, and thank you Raj, thank you John. Now we are going to go to Duke Wheeler, who is the project manager for the environmental review, and he is going to give you an overview of the environmental review process.

[Presentation by Mr. Wheeler]

MR. MCDOWELL: As Chip said, my name is Bruce McDowell, I work at the Lawrence Livermore Laboratory, and I'm the task leader for the team that prepared the supplemental EIS for the Peach Bottom Power Plant.

This slide shows that the approach that we use in making this analysis. The generic environmental impact statement, which Duke has referred to as the GEIS, NUREG 1437, identifies 92 environmental issues that are evaluated for license renewal.

Sixty nine of these issues are considered generic, or category one, which means that the impacts are the same for all reactors, or the same for all reactors with certain features, such as plants that have cooling towers.

For the other 23 issues, referred to as category 2, the NRC found that the impacts were not the same at all sites, and therefore a site-specific analysis was needed. And on this slide it shows the category 2 approach.

Only certain issues addressed in the GEIS are applicable to Peach Bottom. For those generic issues that are applicable to Peach Bottom, we assessed if there was any new information related to the issue that might change the conclusion in the GEIS, which is the new and significant information on the slide.

If there is no new information, then the conclusions of the GEIS are adopted. If new information is identified, and determined to be significant, then a site-specific analysis would be performed.
For the site-specific issues related to Peach Bottom, a site-specific analysis was performed

And, finally, during the scoping period, the public was invited to provide information on potential new issues, and the team during their review looked to see if there were any new issues that needed evaluation.

For each issue identified in the GEIS, an impact level is assigned. These impact levels are consistent with the Council on Environmental Quality Guidance for NEPA analysis.
For a small impact the effect is not detectable, or too small to destabilize, or noticeably alter any important attribute of the resource.

For example, the plant may cause the loss of adult and juvenile fish at the intake structure. If the loss of fish is so small that it cannot be detected in relation to the total population of the river, the impact would be small.

For a moderate impact the effect is sufficient to alter noticeably, but not destabilize important attributes of the resource. Using the fish example, again, if losses at the intake canal cause the population to decline, but then stabilize at a lower level, the impact would be moderate.

And, finally, for an impact to be considered large the effect must be clearly noticeable and sufficient to destabilize important attributes of the resource.

So if losses at an intake canal, for instance at Peach Bottom, cause the fish population to decline to the point where it cannot stabilize, and continually declines, that impact would be large.

In Chapter 2 of the draft supplemental EIS we discuss the plant and the environment around the plant. In Chapter 4 we then looked at the potential impacts for an additional 20 years of operation at the Peach Bottom Nuclear Power Station.

The issues that the team looked at are issues related to the cooling system, the transmission lines, radiological issues, socioeconomic issues, groundwater use and quality, and threatened and endangered species.

I'm going to take a few minutes to discuss the highlights of our analysis. If you have any questions about our findings, Chip will give you an opportunity to ask them.

One of the issues we looked at, closely, is the cooling system for the Peach Bottom station. This is the ladder, the cooling intake, and the canals.

Although there are a number of category 1 issues related to the cooling system, and remember that we said that category 1 issues are those that have been determined to have the same significance for all plants, no new and significant information was identified, either during scoping, by the Applicant, or by the Staff during the review.

The issues that the team looked at on a site-specific basis include water use conflicts, entrainment, and impingement of fish and shellfish, heat shock, and enhancement of microbiological organisms.

We found that the potential impacts in these areas were small and additional mitigation measures were not warranted.

Radiological impacts are a category 1 issue, because it is often a common concern to the public I want to take a minute to discuss this issue at Peach Bottom.

We looked at the effluent release and monitoring program during our site visit. We looked at how the gaseous and liquid effluents were treated and released, as well as how the solid wastes were treated, packaged, and shipped.

We also looked at how the Applicant determines and demonstrates that they are in compliance with the regulations for release of radiological effluents.
This slide shows you the near site, or on-site location the Applicant monitors for atmospheric releases and direct radiation. There are a number of other monitoring stations beyond the site boundary, including locations where water, milk, fish, and food products are sampled.

Our review of the releases, and the resulting dose calculations, found that the doses to the maximally exposed individuals in the Peach Bottom vicinity, were very small fractions of the EPA environmental radiation standards.

In addition we found no new and significant information relating to this issue. The releases from the plant and the resulting off-site potential doses are not expected to increase on a year to year basis, during the 20 year license renewal term.

During scoping comments were received with claims of elevated childhood cancer resulting from releases of strontium 90. I'm going to do a short summary at the end of my presentation. Any questions, I think, would best be directed toward Tricia, who is here from the NRC.

But to summarize the findings in Section 4.7, doses to the public from routine Peach Bottom emissions were specifically evaluated in the 1996 generic EIS for license renewal, and were found to be within regulatory limits.

In-plant monitoring of effluent streams establishes that there have been no significant releases of strontium 90 from the Peach Bottom plant. In addition no causal relationship has been established between levels of strontium 90 and deciduous teeth, and childhood cancer.

Lastly there is a unanimous consensus, in the scientific community, that current radiation protection standards are protective of public health. Therefore the team concluded that the information provided during the scoping period, regarding strontium 90 releases is not new and significant, and does not change the conclusion in the 1996 GEIS, that the radiological impacts are small.

The last issue I would like to discuss from chapter 4 is that of threatened and endangered species. There are no federally listed aquatic species that occur, currently occur, within the vicinity of Peach Bottom and the Conawingo pond.

There are a number of terrestrial species listed as threatened and endangered that may occur in the range of the Peach Bottom Power Station and the transmission lines.
The lower Susquehanna river is an important bald eagle area in Pennsylvania, and one of the areas in the state where bald eagles can be observed year round.

There are ten active bald eagle nests near the Conowingo pond, and recent surveys indicate that as many as 10 to 15 eagles over-winter in the vicinity of the Peach Bottom discharge canal, which may be the only part of the river that is not frozen.

Bog turtles are known to occur in the vicinity of the transmission line, but a survey performed on the line did not find any suitable habitat of those areas in the corridor.

Peregrine falcons are very rare in the Peach Bottom area, although the area is within their range. There is a plant species called the swamp pink, which was not observed during surveys of the transmission corridor.

In other chapters of the GEIS we evaluated the uranium fuel cycle and solid waste management, and decommissioning. All issues for the uranium fuel cycle and solid waste management, as well as decommissioning, are considered category 1.

For our analysis we did not find any new or significant information related to these issues, and so we adopted the conclusions in the GEIS.

The team evaluated the potential environmental impacts associated with the Peach Bottom power station not continuing operation. The team looked at no-action, new generation from coal-fired, gas-fired, and new nuclear, purchased power, alternative technologies such as wind, solar, and hydropower, and then a combination of different alternatives.
For each alternative we looked at, we looked at the same type of issues. For example, we looked at land use, terrestrial ecology, aquatic ecology, socioeconomics that we looked at during the license renewal term.

Our preliminary conclusion for the alternatives, and this includes the no-action alternatives, is that these alternatives may have environmental impacts that at least in some impact categories, reach moderate or large significance.

Now I would like to turn this back over to Chip, and if there are any questions specifically regarding the radiation issues?

FACILITATOR CAMERON: Okay. I think that we might have some follow-ons to Paul's question on radiation and other questions. So perhaps the easiest thing to do is to find out, to ask, to deal with the questions that are on other aspects of the draft environmental impact statement, get those questions in to Bruce, and answers, and then start off with Trish Milligan addressing Paul's question about who the regulations, NRC regulations, are targeted to.

So with these non-radiation questions, Judy, and Marcia.

MS. JOHNSRED: Judith Johnsred. I do want to ask Mr. McDowell to repeat his statement that I jotted down as: There is unanimous agreement in the radiological public health sector that the existing standards are adequately protective of public health.
Did I get that correct, based on what you've just said?

MR. MCDOWELL: I can read it again.

MS. JOHNSRED: Yes, please.

MR. MCDOWELL: I said: Lastly, there is near unanimous consensus in the scientific community.

MS. JOHNSRED: Yes, I don't think you said near before, did you? Go ahead, I'm sorry.

MR. MCDOWELL: I may have misspoke. There is near unanimous consensus in the scientific community that current radiation protection standards are protective of public health.

MS. JOHNSRED: Have you looked at the, what I believe is, the current ICRP reexamination, specifically of tritium?

MR. MCDOWELL: This sounds like a radiation question that I think Trish Milligan could better answer.

MS. JOHNSRED: I have a second question here. I will come back to my second one if it comes to me.

FACILITATOR CAMERON: Marcia, I'm going to come over to you. But let me just make a point. Is that even though Judy Johnsred had a question about have you considered, and we are going to go to that for answers, that some of these questions implicitly raise comments on the draft environmental impact statement, and we will take them as such, comments to consider in our review.

Marcia:

MS. MARKS: My question was on consideration of alternatives. I didn't see up there conservation. I mean, take a look at this room right now. If you would use some proper lighting you could reduce the energy needs extremely.
And I think this is one of the best ways to reduce energy needs.

FACILITATOR CAMERON: Okay, Bruce, how was conservation considered in terms of alternatives?

MR. MCDOWELL: As I said at the start of this presentation, this is sort of the highlights of our presentation. But conservation is considered in chapter 8 of the supplemental EIS.

FACILITATOR CAMERON: Okay. Another question before we go to the radiation? Yes, and give us your name, please.

PBD03

MS. SMITH: I'm Sandy Smith, a member of Pennsylvania Environmental Network. I don't know, is this the time to ask a question that I have on environmental impact? I just heard you mention it.

03-1 I'm concerned, I know some people that have lived here all their life, and they have fished here all their life. And starting in the '80s they've noticed carp in this area that are one-eyed, have strange fins, are different, they don't fight much to be caught. And I'm under the impression, I don't fish or anything, but this is not common for carp. And this seems to be the only area around here that there seems to be some sort of a problem with the carp.

Have you, has anyone brought this to your attention, have you done anything about it, has it been identified, what is happening to the carp?

FACILITATOR CAMERON: Thank you.

MR. MCDOWELL: During our analysis we met with the Fish and Wildlife Service, and with the people that are responsible for the Fishery Restoration Program, where they do sampling, and they inspect, or they monitor the progress of the Shad Restoration Program in the river.

And so the people that we talked to I think were fairly familiar with the fishery in the river, and this has not come up. This has not come up. It may be a valid comment, it has not come up in our conversations with the state and local agencies.

MS. SMITH: Would you look into it?

FACILITATOR CAMERON: Absolutely, Sandy, we will consider that as a comment on this, that will be evaluated.

Judy, do you have that second question?

MS. JOHNSRED: Yes.

FACILITATOR CAMERON: All right.

MS. JOHNSRED: It came back to me. So Pennsylvania is in process of the introduction of a substantial package of legislation resulting from our joint state government commission's work this past year, that would foster the use of alternative sources, with particular emphasis on wind development.

Now, I do know, understand, that Exelon had been considering a 100 megawatt PB, peeble bed modular plant, and has apparently decided not to do so, reactor.
And we will be having, to my understanding from the Penn State Research Center, approximately that amount of additional electricity committed from wind by the end of this year.

So my question is, how and to what extent, did you handle the potential for wind development to satisfy future demand, alternatively, from the Peach Bottom plants?

MR. MCDOWELL: If you would like to look in chapter 8, that is where it is discussed. Our general approach to looking at alternatives were looking at alternatives that would replace the capacity of the Peach Bottom plant.

And we looked at a report, I can pull out the exact report for you, that analyzed or looked at the potential for wind sites in Pennsylvania. And a lot of the wind sites, as I remember, were in inaccessible locations, or were in environmental sensitive areas.

And that limited the number of wind sites, and made some, I think, uneconomic. But due to the fact that wind power is not a very economic, or all the economies, it is not competitive, economically, and the fact that there is not very many locations within Pennsylvania, it didn't look in our analysis, and I will have to go back and show you what we looked at.
That the -- I'm sorry, did you want to rephrase that?

FACILITATOR CAMERON: Judy, do you have a follow-up?

MR. MCDOWELL: That there wasn't a potential for wind power to replace the site.

MS. JOHNSRED: In your economic analysis of wind were you including in comparison with the operation of the nuclear reactor, waste costs for management and disposal?

MR. MCDOWELL: I think it was all costs.

MS. JOHNSRED: All costs of wind. And what were the waste costs associated with wind that you considered, please?

MR. MCDOWELL: No, I didn't say that there were waste costs of wind. I said we considered all the costs associated with the operation.

MS. JOHNSRED: So were there costs associated with waste, related to wind generation?

MR. MCDOWELL: I think that in any operation there is some waste.

MS. JOHNSRED: And what would the waste be with respect to wind?

MR. MCDOWELL: Well, I think you would have maintenance waste.

MS. JOHNSRED: And how does that compare, in cost analysis, with the waste generated by the Peach Bottom reactors for the additional 20 years of operation?

MR. MCDOWELL: We did not do a comparison of waste streams between wind --

MS. JOHNSRED: Thank you.

MR. MCDOWELL: -- power and nuclear.

MS. JOHNSRED: Thank you.

FACILITATOR CAMERON: And, Judy, again the implication, I guess, is there is a critique implied there of the analysis. Sandy?

03-2 MS. SMITH: It kind of took me back. You said there were places that would be good for wind, but it would be inaccessible. I can't imagine any place being inaccessible, when you think of where all the high tension utility wires are going through right now.

It almost looks like it would be inaccessible, and yet they are there. What place in Pennsylvania would be inaccessible for wind?

MR. MCDOWELL: I'm sorry, I didn't mean it was inaccessible for wind, I thought it was inaccessible for connection to a transmission grid.

MS. SMITH: I don't understand if the wires can go there?

MR. MCDOWELL: I can show you in the report. It is hard for me to talk without having the report in front of me. But we can talk about this, and I can discuss it with you, off-line.

FACILITATOR CAMERON: And, Sandy, is that okay with you if we do it specifically? All right, okay.

Let's do a couple more questions, and let's get to the radiation issue. All right, Silver Cloud, do you have a quick question for us? And then I'm going to ask Bruce if it is okay if Trish shares the microphone, comes up there to answer the questions?

MR. MCDOWELL: Sure.

FACILITATOR CAMERON: Silver Cloud?

PBD04-01 MR. SILVER CLOUD: Well, this is actually a statement of fact. I'm glad the lady made mention of something about the fish. But ten years ago my family, we decided not to take any fish, or partake of any fish out of the lake, because we noticed ten years ago that sores and abnormalities on fish in the lake.

We love perch, and we love etcetera, etcetera, the various things, the blue gill. So this is not a new thing, it is going on. And, apparently, not enough investigation is going on to really check this out.
I can say this because I have seen it with my own eyes, and I do not lie.

FACILITATOR CAMERON: Thank you, Silver Cloud. In other words, well not in other words, but another comment on issues to explore.
And, Trish, could you come up and at least start with this issue?

MS. MILLIGAN: Hi, I'm Trish Milligan, I'm a certified health physicist with the NRC. I'm also a pharmacist, I'm licensed to practice pharmacy in 13 states, including Pennsylvania.
I spent a number of years as a nuclear pharmacist, dealing with radioactive drugs for diagnostics, and also for treatment. I've spent a fair number of my professional career working for nuclear reactors.

I also worked for myself for a while, it didn't work out too well, and then I came to the NRC.
To answer your question here, who we are trying to protect? When we do, we require licensees to file each year an annual effluent report. And in that annual effluent report we expect them to characterize the waste stream, and then we expect them to do dose calculations.

In fact we require them to do dose calculations, looking at all of the critical groups. And the critical groups include infants, because we know infants are more than just small adults, they aren't, they have very different metabolisms, they breathe at different rates, they have different dose factors connected with infants.

We also have them do calculations that look at children, and then we have them look at calculations for adults. And when they go through and do these calculations, and I've done these for a number of years for myself when I was working for a utility, that was my responsibility, was to do these calculations.

You would do the calculations, and then one would float to the surface, if you will, as the critical group. Sometimes it was children, sometimes it was infants, occasionally it was adults, but typically it was children.

These doses were reported in the annual effluent reports which are available publicly through the NRC, and I believe the licensee, Peach Bottom can supply them to you, also.
And in these reports you look at what these doses are, and they are typically reported in milli rem doses. They are appendix I limits, which are very conservative limits, 5 milli rem whole body, and numbers that are similar to that for organ doses.

And these doses are typically infractions of milli rem doses. So we look at these constantly. Each year that the licensee operates they file with us this report. So we have an ongoing

understanding of what the doses are to the whole range of the population. Not just organ doses, but skin dose, and whole body dose.
Does that answer --

FACILITATOR CAMERON: Paul, does that answer your question? And if you have a follow-up, if you wouldn't mind using that microphone?

MR. GUNTER: Well, obviously this is -- I'm Paul Gunter with Nuclear Information Resource Service.

Obviously there is an ongoing dialogue here. But just a simple question, in administering therapeutic radiation, do children get the same dose as adults, or is it recognized, in the therapeutical use of radiation, that children have a lower tolerance to radiation?
Is that generally correct?

MS. MILLIGAN: It depends on what you are treating, and what --

MR. GUNTER: I'm just saying generally.

MS. MILLIGAN: -- you are doing.

MR. GUNTER: Is it acknowledged that children have a lower threshold to radiation than adults?

MS. MILLIGAN: You would typically give a child a lower dose because it is a lower body mass.

MR. GUNTER: Right.

MS. MILLIGAN: But you are talking, in terms of therapy, you are talking extraordinarily high doses that are well above NRC dose limits, well above.

MR. GUNTER: My point, though, is that in considering a 20 year license extension, that what our concern is that there is a cumulative value there. And that the children, in our mind, is the target population, the critical population when evaluated the cumulative effect of 20 years additional operation of that reactor.

And it is our concern that that be the determining factor for a 20 year license extension.

MS. MILLIGAN: And you want us to look specifically at child dose?

PBD 01 2

MR. GUNTER: I think, again, I'm going to try to restate this clearly.
In considering a 20 year license extension, and 20 years additional operation, in our view the critical population that would determine that operation is the children. And that the

cumulative effect, that there is a cumulative effect of 20 years additional operation, with ongoing routine releases that build up in the environment, that bio-magnify.

The focus of our concern, and it should be your concern, is the bio-magnification to the children in this area. And it is our concern that that is not being addressed in the environmental impact statement.

MS. MILLIGAN: When we look at, in the operating reactor space, the dose limits that are set up from our appendix I limits, are very, very small.

To give you an example, if you ate one medium sized banana a day, every day for a year, you would come up with approximately a two milli rem dose to your whole body, from eating that banana, from natural radioactivity that is in that banana.

Our dose limits, whole body, for appendix I is 5 milli rem. So you double your banana dose a day, and you've got our effluent limits from our plants.

So when we look at what our licensees are actually releasing, they are releasing, typically, a tenth to a hundredth of that, in a total year's worth of dose to that particular critical group. So we are looking, very closely, and we watch closely, at what our licensees are allowed to release, and the doses are very, very small. You get, like I said, two bananas a day, and you are at our appendix I limits, and very few of our licensees, I think, have ever approached our appendix I limits.

FACILITATOR CAMERON: I think that we do have a comment there from Paul, is that the analysis in the environmental impact statement, or the analysis or radiation doses should be the critical path item, so to speak, not only the effect of radiation on children, but the cumulative effect over a 20 year period.
And Trish is, I take it, that what you are saying is that -- do we look at cumulative effects, in terms of -- it is all factored into the process?

MR. SHANBAKY: My name is Mohamed Shanbaky, I'm the branch chief, region one, responsible for the inspection program at NRC, and inspection program at Peach Bottom. As far as cumulative effect, the doses that are being calculated are mostly a committed dose, both national and international expert, they calculate internal doses of radioactive material, based on 50 years.

And when you talk about committed dose, to a child, it is still a very, very low fraction of what the EPA regulations say as to exposure to minors. So it is still, even if you consider the cumulative, and you talk about committed dose, it is still very low.

FACILITATOR CAMERON: Okay, thanks, Mohamed.

Let's take a few more questions on this issue, and then we are going to have to move on to consider severe accidents.
This gentleman?

MR. AUGUST: My name is Bernard August. My question to you is, I've gotten a bit jaded about corporate responsibility, and things of this nature, recently, because we have all been affected by it.

What guarantee that the information that you are getting from the utilities that run nuclear power plants is accurate?

MS. MILLIGAN: Well, we have resident inspectors at the sites that live there. We also have inspection teams that go out and routinely look at all these different parts of the NRC program, of the licensee's program. So they are inspected on a regular basis.

FACILITATOR CAMERON: Does anybody from NRC want to supplement --

MR. SHANBAKY: I'd like to say one word on this. I have, as we speak right now, have resident inspectors from the NRC, what they are doing, they are walking down systems, they are looking at equipment, and they are looking at maintenance activities.

The licensee gives us unfettered access to all the plant's area, including all the vital equipment in the plant. We look at them, we touch them, feel them, we test them.
So it is not just we take the word of the licensee. We trust, but we verify, we go out and verify that the licensee is giving us factual information.

FACILITATOR CAMERON: Thanks, Mohamed. Let me see if there is anybody that has a question that we haven't heard from.

Let's take Judy, and then Marcia, and then let's go to Bob Palla. And, Trish, I think these may be questions for you, I'm not sure.

PBD05

MS. JOHNSRED: Yes, thank you, Judith Johnsred. It is my understanding that the dose standards have been decided upon in terms of standard man. That is the measure for the setting of the doses that, then, presumably the plant will operate below.

05-1

And it raises a couple of questions. A geneticist has asked me, repeatedly, how the NRC, in determining dose impacts, deals with not only the child, and not only the fetus, and not only the embryo, but cumulative impact upon the ova that a woman carries through her life, and that are the basis of, of course, the ultimate embryo, fetus, and child?

That is one question. And related to it is the issue of how the NRC will incorporate the additive doses received from deregulated released, recycled, and reused radioactive materials, not only those generated at the plant, and then subsequently released, either as materials or waste, for recycle, but also essentially the other doses, each of them presumably small, that would be received from other sources of recycled radioactive materials. 0 5-2

And I'm thinking here, in particular, of the fact that not only the NRC is considering a large expansion of release and recycle but, in fact day before yesterday the comment period closed on Part 71, the transportation harmonization regulations that also involve exemptions.

Plus -- well, T-Norm is coming up, I guess, as well. So there are, suddenly, a great many additive sources for exposures. And it is not clear how those are incorporated in your analyses. 0 5-3

MS. JOHNSRED: Let me answer the first part of your first question.

When we established dose limits for the public, which is everyone in the public domain, not an occupational worker, we established doses that are at a considerably lower level, so 100 milli rem per year, for example, is a dose limit for the public.

With that we feel that we have, that we provide good protection to the public from radiation. Now, I referred earlier, and we've talked about the EPA limits, which are 5 milli rem per year, so that is one-twentieth of what our limits are for our general Part 20 limits for radiation to the public.

So we are looking at a very small fraction. And if you look at what is actually, what the members of the public receive from our power plant effluents, that is a fraction of a tenth, or a hundredth below that as well.

So with that kind of protection you are looking at, it would be extremely low doses, to a woman's ova. Now, if you look at the contribution, from background radiation, from just living here, living in Pennsylvania, where we have a high background, eating naturally radioactive food, you see a dose contribution including from other sources, such as medicine, somewhere around 300 to 400 milli rem per year.

I'm sorry? So you look at our limits are very, very small. And you look at other parts of the country that have even higher natural background radiation limits, and you see adequate protection provided by our licensee limits, from that added incremental dose.

FACILITATOR CAMERON: And, Trish, is there anything that you can say on Judy's second question about how, I guess, new sources of radiation are dealt with through the regulations?

MS. MILLIGAN: When we look at release of recycled materials, we create a series of scenarios, a whole series of scenarios that look at this recycled metal becomes a fork, for example, or becomes a tire, or table, or pick anything.

We look at what would be the exposure, what would be the people, what would be the contributing dose assuming a resident time of, you know, maybe 20 hours a day sitting on top of that table, what would be your dose?

We consider all these various exposure scenarios, and then we come up with a dose limit that says, at this point this amount of material could, potentially, be released.

But I don't work on the materials side of the house, and I can't talk to all the regulations and what they are doing, I strictly work on the reactor side. And the materials side has put a lot of work into that, and I don't know all the regulations.

What we could do would be to direct you to the appropriate people in the materials side that could answer your questions much better than I can.

FACILITATOR CAMERON: Thanks, Trish and thanks, Judy. Let's take one last question from Marcia and let's bring Bob Palla up to talk about severe accident mitigation alternatives.

MS. MARKS: I think that Judy asked my first question, which was exposure to the pregnant woman, and to the ova over a woman's lifetime. And she asked that.

And most of the public isn't aware, Dr. Ellis Stuart just died, and she was able to prove transgenerational effects of radiation to the pregnant woman, onto the children.
My question, though, is when you are -- on your measurements, you said you measure the effluent. And if I read this correctly, in the environmental impact statement, you measure the strontium 89 only every four months.
If the half life is only 50 days, how in the world are you finding it? How often do you measure this effluent? You talked about a yearly report.

MS. JOHNSRED: What you are asking is how often do the licensee's measure their effluent stream? The licensee's monitor their effluent stream on a regular basis, regular being daily, minute by minute, hour by hour, day by day.

They have a good handle on what their water chemistry is, and what their effluent stream is.

MS. MARKS: Then what I read in the report was not --

MS. JOHNSRED: No, the numbers are tabulated quarterly. All the effluents and the water chemistry is done on a daily basis.

[Presentation by Mr. Palla

MR. AUGUST: In light of the fact that -- Bernard August -- that this plant here gets its water from the river, was any consideration at all given just in case a natural disaster, like the dam breaking, or anything like that, taken into consideration during this report?

MR. PALLA: Dam break type of events, and floods, external floods, these type of events are considered in what was -- we term it the individual plant examination for external events. It is a type of a risk study that was done. These studies are not strictly quantitative type analysis, they are more of a -- it is an engineering assessment, really.

But the results of those studies were submitted to the Staff, and reviewed as part of our review of the individual plant examination. They were found to be much lower in risk than the risk from internally initiated events.

So they did not play a role in this analysis. The risks that we are trying to reduce here is largely driven by internally initiated events, which did not include those types of events.

FACILITATOR CAMERON: Okay. Mohamed, before we go to the gentleman behind you, do you want to make a clarification?

MR. SHANBAKY: A quick clarification on this. That was assessed in the original plant design. The plant have emergency cooling towers. Emergency cooling towers would provide adequate cooling for all necessary equipment shut down.

The water supply is on hand, at the base of the tower you have, I believe, 3.7 million gallons of water that you would be using, it would give you seven days of water use to cool down the plant.
So that was assessed, and the equipment is operational, and on-site.

FACILITATOR CAMERON: Thank you, Mohamed. Let's go to this gentleman right back here.

MR. EGBERT: Lawrence Egbert from Baltimore. You eliminated 174 candidate improvement possibilities, and then you subsequently eliminated 25 of the remaining 30.
What was the difference between the way you eliminated them?

MR. PALLA: Well, it was a sequential process. It began, the large number was the result of basically throwing out a large net, trying to look at analysis that were done at several different plants, and effectively including those as candidate SAMAs.

And then so you start with a large number, many of which you know at the outset, probably aren't going to pass an initial screening, because in some cases an improvement might really have been evaluated at another plant, which is a pressurized water reactor.

So it may not be applicable, at all, in concept to a boiling water reactor, such as Peach Bottom.
So it is -- we actually outlined it fairly clearly, I think, in our report what that sequential process was.

But, as I mentioned earlier, the process was to eliminate things that had already been implemented. Sometimes you might have two different alternatives that by and large do the same thing, so you can combine them into a single alternative that you can consider further.
So there is some collapsing there, as well. Some of these fixes may address sequences that don't have any significant contribution to the risk profile, this would be another reason.
And then some are so clearly resource intensive and expensive that you can tell that even if you eliminated all of the risk at the plant that this would not be cost beneficial.

So there is some confusion, it wasn't a very straightforward process, it was a multi-phased process that I think is explained in the report. But I could talk to you more about it, later, if you have some specific questions.

FACILITATOR CAMERON: Okay, they very much, Bob.

MR. PALLA: We look at that process to see that it is systematic, and logical, and that the criteria used to screen these things is reasonable.

FACILITATOR CAMERON: Okay. We have one more question for you, and then we are going to get to Duke Wheeler, again, for the conclusion, so that we can hear from everybody that has comments.
Yes, sir?

MR. MCCONNELL: Sam McConnell, and I'm a Peach Bottom resident.
What is the agreement, or how does NRC operate with FERC, the Federal Energy Regulatory Commission, in regards to nuclear accidents, who takes priority, the requirement for electricity, or the nuclear accident?

FACILITATOR CAMERON: Do we have -- who wants to address that specific question, perhaps, within the general context of emergency planning? I think we will go to John Tappert for that one.
And, John, you heard the specific question that the gentleman had?

MR. TAPPERT: Yes. I mean, obviously, the mandate of the NRC is the health and safety of the public. So if there were an incident, or something, at the facility the first mandate of the Agency is the safety of the plant.
So energy concerns really aren't part of that picture.

FACILITATOR CAMERON: Do you want to comment on --

MR. GUNTER: I just wanted to -- Paul Gunter, Nuclear Information Resource Service. The term that the NRC uses is called as low as reasonably achievable, ALARA. Now, ALARA is used a lot in determining cost beneficial analyses for safety.

And I'm sure you worked ALARA into the license extension. But one of the principles of ALARA, one of the principal considerations of ALARA is economics. So -- and it is stated right there in the Code of Federal Regulations.

So when you talk about balancing dose, for example, against continued operation, economics does come into play through the ALARA principle.

FACILITATOR CAMERON: And, Paul, that is a good comment. And I think that maybe it would give Bob an opportunity to, when you talk about doing cost benefit on whether a particular SAMA should be implemented, you are talking about based on the assumption that the NRC regulations are being met.

All of these things are over and above what is necessary to provide adequate protection to public health and safety?

MR. PALLA: This is -- economics is deeply ingrained in this whole process. The SAMA evaluation is essentially looking at ways that risk can be reduced, these each have a cost. And then they would result in a reduction in core damage frequency, or person rem at the site, and the surroundings.

And these are all put in terms of dollars and compared. You are comparing cost of implementation against costs that are associated with, you know, the benefits of reducing, or eliminating the accidents.
So, yes, economics is really what this is.

[Presentation by Mr. Wheeler]

FACILITATOR CAMERON: Thank you very much. We are going to go right into our public comment portion of the program.

And our first speaker is Joe Mangano. And, Joe, I hope I'm pronouncing your name right. But correct that if I didn't. And Joe is with the Radiation Public Health Project. And he has come down from New York City.

And because of that I have to ask everybody to try to be brief, and I talked about the five to seven minute ground rule, because we do have a lot of speakers, and we do want to hear all of you.

Because Joe has come down from New York City, national group, we are going to give him just a couple minutes leeway, so he can make his presentation.

And, Joe, if you would come up? And I'm going to move this out in the center, and you can refer to it as you want, okay?

PBD06

MR. MANGANO: Good afternoon, everyone. Again, I'm Joseph Mangano, I'm the National Coordinator for the Radiation and Public Health Project in New York City.

We are a group of professional researchers. In the last eight years we have published 17 articles in medical journals, and written five books about the health effects of radiation exposure.

My comments today will be about, will be addressed to the environmental impact statement draft. And my -- the nature of my comment will be that, in essence, this is a very limited document to make any sort of decision on whether to extend the license of this plant for 20 years.

I will break my comments into three, very briefly. First of all, major meltdowns and accidents; number two, nuclear waste; number three, routine emissions and cancers.

First of all, in terms of accidents, we've known for a long time that any kind of a major core meltdown in a nuclear plant like Peach Bottom would be the worse environmental catastrophe in the United States history.

06-1

Twenty years ago the federal government did a study and showed that if either one of the cores of the Peach Bottom reactors had a full meltdown, 72,000 people would die, 45,000 would suffer acute radiation poisoning, and 37,000 others would develop cancers.

Now, remember, this is a minimum estimate, because if both reactors had meltdowns you could double that. This was done 20 years ago, the population has grown since, it only considers the area within 30 miles of the plants, and it ignores the stored fuel, the radioactive waste, which consists of much, much more radiation than is in the core.

In fact, there is hundreds of Hiroshima bombs worth of radiation in there. The EIS ignores this. It does not ignore the issue of an accident, but it ignores two new threats that we have here, beyond when the plant was opened.

First of all, September 11th changed everything. We now have this very new, and very clear, and very serious threat of a terrorist attack towards a nuclear plant, which certainly calls out for a new study, and consideration of safety factors.

Number two, we are not talking about a plant that is just about to open. We are talking about a nuclear plant that is going to be operating from age 40 to 60.

06-2 Now, so far the oldest reactor has been Big Rock Point in Michigan. It lasted 34 years, it is now closed, okay? We don't know what a 40 or 50, or 60 year nuclear plant will be like; will the plants wear out mechanically?

We just observed, recently, that the Davis-Besse reactor, in Toledo, Ohio, because of corrosion from the cooling water, a six inch steel lid, on top of the plant, was corroded down to 3/8ths of an inch of steel that was bent, and was found not by a routine inspection, but just by accident.

06-3 So it is clear here that we need to see more in terms of what would happen in terms of an aging plant, and in terms of a possible accident.

Number two is nuclear waste. The spent fuel pools that exist at Peach Bottom, and other reactors, were thought of as a temporary means of storing these radioactive fuel rods. They are still temporary, okay? Only they are filling up now.

06-4 Almost 30 years later the fuel pools here at Peach Bottom are almost full. In fact they are putting some into dry cask storage, and the issue of Yucca Mountain, Nevada, being a permanent site, is moving along but it is still up in the air. It will be at least eight years before any transfers are to be made from there.

That goes unaddressed here, as well. And the existence of this fuel, again, presents a threat to the public's health.

Now, in terms of routine emissions, the position of the NRC, traditionally, has been that emissions will be monitored, the environmental levels of radiation will be monitored. If they fall within the federal safe permissible limits, therefore they are declared to be harmless.

06-5 Our group believes that this is a presumptuous attitude to take. You don't know. For example, look at what happened at the World Trade Center. The Trade Center was attacked, and numerous chemicals, such as silicon, and asbestos, were put into the atmosphere at higher levels.

Well, the EPA went in, did a study and said, yes, the levels are higher, but they are within safe limits, therefore they are harmless. At the same time this is happening about a quarter of the workers were suffering from some sort of respiratory ailment.

Three percent of them so badly that they are on the verge of having to retire. So we think the same should occur here in terms of nuclear reactors. And to do that you need two items.

06-6 Number one, you must look at the disease rates, and particularly at the cancer rates in the local area. Our group spends lots and lots of time doing that. I will just point a few out here in the Peach Bottom area.

In Lancaster and York counties, which flank the reactor, in the years before, the 25 years before the plant opened, childhood cancer deaths in the two counties were seven percent below the U.S. rate.

06-7 Since 1987 the rate is 31 percent above the U.S. average, okay? Something happened that turned a low childhood cancer area into a high childhood cancer area. Is it radioactive, is it some sort of other factor that must be looked at?

Among adult cancers in Lancaster, York, and Chester county, the three closest counties, the rate since '87, the rate of all cancers is 9 percent above the U.S. Breast cancer is 26 percent above the U.S. Thyroid cancer, which is very sensitive to radioactive iodine, 60 percent above.

06-8 Again, these are questions that remain unanswered. Whether or not radioactive plays a role, or not, has to be determined. And the way to determine that is to look at the amount of radioactive in the body.

It is one thing to measure emissions, it is one thing to measure how much is in the air, and the water, and the grass. But the real question is, how much gets into the body? This is not something that we invented, this was done in St. Louis, years ago, to measure how much bomb test fallout went into people's bodies.

And it has been done in the 1990s in four different countries, in Greece, United Kingdom, former West Germany, and in the south Ukraine to measure how much is coming out from nuclear reactors like Chernobyl and Sulleyfied in England.

And in each case they looked at baby teeth and the amount of radioactive strontium 90, which only comes from atomic bombs and nuclear reactors. We are doing a study right now. I've collected almost 4,000 teeth.

Unfortunately here in Pennsylvania, southeast Pennsylvania, we only have 22 teeth, we need many more. We've collected many more, but are still in our processing them.

So far, based on just these 22 teeth, the average level of strontium 90 is 68 percent higher than the other six states that we've collected teeth from. That is Pennsylvania, Connecticut, New York, New Jersey, Florida, and California.

There is a reason for this. The EIS spent nine pages discussing, and challenging our baby teeth study, making the claim that this strontium 90 was all left over from the bomb test in the '50s and '60s.

Well, back in the '50s and '60s the strontium 90 levels in teeth were pretty much average, compared to the rest of the country, now they are much higher. I don't think it is because of old bomb testing.

06-9 And the other thing we found, so far, in southeast Pennsylvania and elsewhere, the children born in the 1990s have higher levels of strontium 90 than do those born in the '80s, they are going up slightly in Pennsylvania up 12 percent.

This cannot be due to the old bomb test fallout just decaying, it has to be due to a current source of strontium 90 which is, can only be nuclear reactors.

My time is almost up, here. Again, low levels, we are not talking about high levels of radioactive, here. This is not Hiroshima here, this is not Chernobyl, these are low levels of radiation.

But, again, before we make the conclusion that it is harmless, or harmful, we must do these studies. And we've been wrong in the past, before. Years, until the '50s doctors did pelvic x-rays on pregnant women saying that these x-rays were too low a dose to be harmful, until they found that the risk of the child getting cancer doubled.

For many years the Government said that bomb test fallout from the Nevada tests were harmless, even if it was getting in the milk, and the water, and the food. Finally in 1997 a study was done, by the federal government, showing that up to 212,000 americans developed just thyroid cancer from these bomb tests.

06-10 So this is a learning process, this is a relatively new technology, we are learning things, and we should engage in the same type of process with nuclear reactors.

06-11 So in conclusion I would highly recommend that no decision be made, by the NRC, to extend the license of this plant until a much more thorough assessment of environmental health threats are made. Thank you.

FACILITATOR CAMERON: And, Joe, thank you. And if we could, I don't know if it is possible to get a reduction of that map, an eight and a half by eleven that we could put on the transcript? We can try to work with that.

But since we have you here, live so to speak, and to make -- I guess I shouldn't say so to speak. Since we have an opportunity to talk to you, let me put it that way, I'm sorry. Would you mind if there is any questions that the NRC staff has to enable them to better evaluate this? And I don't want to get into a debate on this, okay? in terms of challenging. Could they ask you any questions that they have?
MR. MANGANO: Go right ahead.

FACILITATOR CAMERON: Is there any questions related to our evaluation? Trish?

MS. MILLIGAN: Yes, I just have two quick questions. NRC is always interested in new information, and we are constantly evaluating information on a regular basis.
On your report, there, if you could hold that up for me real quick? It says, right up here, strontium 90 concentrations in baby teeth measured at birth.

My first question is, how do you measure baby teeth at birth? Because that would be very new for us, to understand how you do that.

MR. MANGANO: Sure. The child aged 7, or whatever, loses a tooth, donates it to us, we measure it, and we –

MS. MILLIGAN: Back calculate?

MR. MANGANO: Basd on the half life of 29 years of strontium 90, extrapolate that level back. Most of the uptake is in the fetal, in the early –

MS. MILLIGAN: Right, so this is actually back calculation?

MR. MANGANO: So it is pretty close, that is what they did in St. Louis years ago.

MS. MILLIGAN: I just wanted to make sure that was clear. And the second thing is, could you please share with us your data on these increased cancer rates, so that we could see the data that you are looking at?

MR. MANGANO: Sure, I brought copies with me.

MS. MILLIGAN: Terrific, that would be great.

MR. MANGANO: Where I got them from, and all that, because I thought someone could use it.

MS. MILLIGAN: Thank you very much.

FACILITATOR CAMERON: Thank you very much, Joe. And we would be interested in a copy, a small copy, and I'm sure that there are members of the public that might be interested in looking at a copy of that, too.
Thank you very much, Joe. You had a question on, for Joe?

MR. PALLA: Yes.

FACILITATOR CAMERON: Joe, we have one more question from the NRC staff.

MR. PALLA: I had a question, at the beginning of your presentation you had some statistics about fatalities from major core melt events. And my question is, have you looked at, or are aware of more recent studies than the 30 or 40 year old? I forget exactly what -- okay.
Have you looked at anything more recent than that, as far as the plant specific analyses that have been done for Peach Bottom, for example? Because the results from those studies are considerably lower than the numbers that you had cited.

MR. MANGANO: To my knowledge that study, there has been one more subsequent study done after that, what they call the crack 2 report, in 1982 by Sandia National Labs.

It was done in 1989, and it makes updated judgements on what would happen during an accident, but it does not give any specific numbers yet. So at this point that is all we have to go on.

It is probably most useful not to make an exact judgement on exactly how many people would be injured, but just to give people an idea that, yes, hundreds of thousands of people would be involved, would either become ill or die.

FACILITATOR CAMERON: Okay, thank you and thanks, Bob.We are going to go on to our next speakers. And our next three speakers. And thank you again, Joe. Silver CLoud Washburn. Silver Cloud, would you come up and please talk to us?
And then we will go to Alan Nelson, and Dr. Judy Johnsred.

PBD04

MR. WASHBURN: Firstly I would like to start off by saying, to the person, the omnipotent, the it that made it possible for me to be here today, grandfather, Jehova.

And I thank grandfather that everyone who is here is here, because they are concerned about this issue. My major concern with this issue, and my prayer is simply this.

04-2 Has anyone, from the inception of the nuclear energy program, whether it be reactors or bombs, given any thought to what would happen seven generations in the future?
I would postulate to you, no. Because your opinion doesn't think that way. But I want you to know that the Native-American thinks about things in these terms. Not all of us, because there are rotten apples in our barrel, too, undoubtedly.

04-3 But the big concern that I have here is the future generations. We are talking 250,000 years of financial indentured servitude. Because the Exelon Corporation is not going to pay for the maintenance and the overhead costs of this facility for 500 years, 1,000 years, and so on. Who is going to do it?

It is our children, and our grandchildren, and our great-grandchildren, and countless future generations. Exelon Corporation is only interested in what they can extract financially out of this deal.

04-4 I don't know if they are in bed with Enron, but I tell you what, Exelon, when they are done with it, probably already has secret plans to simply go bankrupt. And when they do, who pays the bill?

Not only do NRC's progeny, and mine, and everyone else's, but it is passed down, and it is more than a lifetime sentence of debt, and burden. When you look at this debt and burden what is going to happen in the future, when the people decide we have had enough, we are not paying anymore.

Well, then the deterioration will begin at all of these plants. I don't know how many there are, exactly, 100 and some in the United States. But you know it doesn't make any sense to me, because what has happened here, the European came to these shores, and they gave the Native-American its bullets and disease.

04-5 And now, since we are all here, and I accept you, I'm not angry with anyone, but now they are going to give all of us their toxicological waste. And no provision or thought was given to this at the inception of these plans, none.

I hope you are thinking about it, gentlemen. I hope the people hearing my voice are thinking about this. Because this stuff must be contained. And Yucca Mountain, really, may not be the solution.

I would pray to Grandfather that it is, and that it has been well thought out. But it seems funny to me, why didn't they put it in the middle of New York City? Why did they have to put it on indian land?

Think about it, we are constantly punished. Well, you know something? There is not going to be enough trees left on the planet earth to print the money that it is going to take.

04-7 The word is a guguplex of dollars, it is not there. And I just beg you, I will tell you this, I will give you the shirt off my back, I will give you everything I own, to shut this plant down. I would stand here and allow you to take my life because I love all people so much.
Shut it down. I would walk out of here naked, I would be a pauper and a vagabond, I would be happy to do this. That is my contribution to the people. You have to understand that this is foolishness.

Whatever happened, in the name of heaven, to common sense? You can go to college and get all the education you want from the books. But you all fail to realize, and most people do, and even I, until I was in my 40s, realized that common sense is the higher level of intelligence.

And once you get in touch with the creator of all things, and ask to be shown, through these words given to me by a sacred spirit, isha del talalatacna (Phonetic) open my eyes that I may see.

That voice told me, use these words wisely. Use them where you see a need to do good. So to you people, you wonderful people who I love, Gonkieue (Phonetic) in my tongue that means I love you.

04-8 Isha delta lalatacna (Phonetic) open my eyes that I may see. This is my prayer for everyone in this room. Please shut this place down, let us begin to bear this burden, and figure a way out of it. Thank you.
(Applause.)

FACILITATOR CAMERON: Thank you very much, Silver Cloud. And I would not want to follow Silver Cloud on a presentation, because he is very impressive.
Alan Nelson will follow him, though.

PBD07 MR. NELSON: Well, how do you pick your spots?

Good afternoon. License renewal is the best option for Peach Bottom. My name is Alan Nelson, I'm a senior project manager at the Nuclear Energy Institute. I'm pleased to have the opportunity to join this discussion today, among

interested citizens of Pennsylvania, and Maryland, state and local officials, NRC staff, and other parties on license renewal for Peach Bottom.

By way of background, the Nuclear Energy Institute coordinates energy policy for the U.S. energy companies that own a nuclear power plant. The institute also represents industry suppliers, fuel cycle companies, universities, and colleges, and other organizations involved in the beneficial uses of nuclear technologies such as medicine, agriculture, and food safety and space exploration.

Nuclear energy provides electricity for one of every five homes and businesses in America. Here in Pennsylvania electricity customers get their electric power from nine nuclear reactors, including Peach Bottom, as well as Limerick, TMI, Susquehanna, and Beaver Valley.

The purpose of today's meeting is to discuss environmental issues related to the license renewal application for Peach Bottom that Exelon has submitted to the NRC back in July 2nd, 2001.

Exelon is the tenth utility to seek nuclear plant license renewal. In March of 2000 the NRC, for the first time, approved a 20 year license extension for two reactors at the Calvert Cliffs Nuclear power plant on the shores of the Chesapeake Bay, in Maryland.

That approval was a landmark in the industry and evidence of tremendous long term energy and environmental benefits of nuclear power. To date ten reactors have received 20 year license extensions from the NRC, and the Agency is reviewing requests from 14 others, including Peach Bottom.

More than half of all 103 U.S. reactors are expected to submit applications over the next several years. Many more are expected to join them. Renewing nuclear power plant licenses for an additional 20 years is economical compared to the development of alternative energy resources.

As both the Nuclear Regulatory Commission and stakeholders have become more familiar with the process, we expect the license renewal process to become even more efficient.

07-1 Moreover there is a growing recognition, among the public and policy makers, both in the United States, and internationally, that we must maintain the clean air and other environmental benefits of nuclear energy.

The White House recognized, very clearly, air benefits of nuclear energy in its comprehensive energy strategy. Vice President Dick Cheney has said, and I quote: "If you are really serious about reducing green house gases, one of the solutions to the problem is to go back and take another look at nuclear power."

07-2 There are tremendous air quality advantages from nuclear energy, for both the health of Pennsylvania citizens, and from an economic view. License renewal for nuclear power plants is important to our nation's future energy, security, and environmental needs.
Today's public meeting is part of an extensive process to help ensure that no important environmental issues are overlooked as the NRC continues to evaluate the Peach Bottom license renewal application.

Throughout its review the NRC will continue to keep interested citizens, and stakeholders, appraised of its progress. One of the requirements in the environmental review is for Exelon to compare the environmental impacts of alternative energy sources as part of evaluating possible alternatives to relicensing Peach Bottom.

The results of that evaluation are worth noting. For example, photo-voltaic cells generating the same 2,200 megawatts of power produced at Peach Bottom, will consume about 77,000 acres of land.

The draft generic environmental impact statement also evaluates other alternatives for providing electricity for the people of Pennsylvania, including power plants that burn coal, natural gas, oil, wind power, as well as hydro, geothermal energy, and biomass derivative fuels.

The GEIS even considers no-action alternative that was stated, do nothing. The report concludes that these alternative actions, including the no-action alternative, are not feasible, or have environmental impacts of moderate to high significance.
In contrast the report concludes that environmental impacts associated with renewing the Peach Bottom license are small. With the extension of the license it means 20 more years of environmental and economic benefits, and continued reliable electricity for consumers and businesses in southeastern Pennsylvania.

07-3 What exactly does license renewal mean? I happen to think it is a necessary option. Let me give you three key reasons why. First, license renewal will maintain economic electric generation that does not produce green house gases, or other air pollutants, such as sulfur dioxide, nitrogen oxide, and particulates.

07-4 Second, license renewal will preserve good jobs for this area, and communities like Delta and Peach Bottom Township, where these plants are located, will benefit from the plant's continued operation.

07-5

Third, renewal of Peach Bottom's license is far more economical than building a new power plant.

Many people don't realize that nuclear energy is the largest source of emission free electricity generation in America. It represents nearly 70 percent of our nation's emission free generation.

Hydroelectric power is second, with 29 percent, photo-voltaic cells, and wind power, each represent less than one percent of emission free generation.

It is obvious, from these figures, that nuclear energy provides vital clean air benefits to southeastern Pennsylvania, and the United States, considering that each state must control emissions from electric generating sources, through the Clean Air Act.

In your community Peach Bottom also provides stable jobs and safe, reliable, and affordable electricity. I want to close by saying that the draft GEIS is factual and complete, and could contribute to a fair and objective review of an environmental impact of license renewal at Peach Bottom.

And I would like to commend Exelon, and the nuclear professionals at Peach Bottom, for their continued excellent record of safety performance, and commitment, to protect the public health and safety, and the environment.

Together these are the key factors, in the NRC's conclusion, in the draft GEIS, that supports a positive decision on renewing the license for an additional 20 years.
Thank you very much.

FACILITATOR CAMERON: Thank you, Alan. next we are going to go to Dr. Judy Johnsred. Do you want to talk from here, or from there?

MS. JOHNSRED: Chip, I've already had a number of comments, and I think it would be preferable for others who have been silent, to proceed. And if I may, I would like to speak a little bit later.

FACILITATOR CAMERON: Thank you, Judy. Let's go to the next three speakers, then, and we can circle back to Judy. First Marcia Marks, then Paul Gunter, then Sandy Smith. Marcia?

PBD08

MS. MARKS: My name is Marcia Marks, and I live in Bethesda, Maryland.
I have about 40 years front line experience in public health, and social services. And I would like to talk to you, really, about what we are seeing in the community.

If many of you have seen this, there have been five full page ads in the New York Times saying, why are more kids getting brain cancer, why can't Johnny read, sit still, or stop hitting the neighbor's kid?

There are increases in asthma, diabetes, and many other diseases. Book titles by scientists, international scientists, "Our Stolen Future", "Our Children's Legacy", "Generations at Risk", and "Terminus Brain".

What we are seeing in the public health community is a very straight deterioration of human health, and the health care costs are out of control. In 1962 Rachel Carson wrote in her book, "Silent Spring": Chemicals and radiation are changing the very nature of this world". And that is what we are seeing.

In reading the environmental impact statement there were at least 132 references to the word small, and then in caps, SMALL, small risks, small environmental impacts, small significance, etcetera, etcetera.

08-1 What is meant by small risks? Does that mean if my family and I get sick, that is just a small amount? What happens as the environmental impact statement said, that in 45 years the increase in population will be 62 percent, does small then become medium risks?
The nuclear industry is protected by Congress, under the Price-Anderson Act, because no insurance company would take a financial risk of insuring a nuclear reactor.

Who will protect me and my family if we get sick? Certainly not the federal government. The record and history has proven the government does not take financial responsibility when it harms its citizens.

It took 50 years to get compensation for nuclear plant workers, and those who worked in the industry during the war. Gulf War veterans have received no remuneration.

08-3 My next question is, and I have a lot of questions. Why has the government stopped taking in body measurements of strontium 90 in bones and teeth?
The U.S. Agency for Toxic Substances and Disease Registry, is starting to measure toxic chemicals to determine human exposure.

This is the best proof of toxins in the environment. The same needs to be done for radio nucleides, particularly SR90 in the bones and teeth. Why hasn't the government done this since 1963?

08-4 Shouldn't the public be made aware of why Peach Bottom 1 was closed in 1987? It is true that the cause was operators were sleeping on the jobs, and taking drugs? Where are the records published about the plant violations, such as those in 1982, '83, and the death of an employee in 1985?

08-5 Is it true that the NRC called Peach Bottom one of the worse plants in the nation, and shut down Peach Bottom 1 in 1987? Do you think people are more efficient today? I certainly don't. I think general maintenance is improving. Maybe the people that are fixing the plant would like to come to my house, because my house is only 35 years old. Every time I repair one thing, something else breaks down.

08-6 It is -- maintenance is a continual problem. Look at today's schools where the children are getting sick because of maintenance problems, and other reasons.

08-7 Peach Bottom is the agriculture area for many parts of the east coast. How often are measurements done on the milk, and milk products that enter our communities? Isn't it interesting that the schools get free milk and free cheese?

08-8 When milk is mixed from different farms it becomes impossible to trace it to its source. How often are these products tested for strontium 90 and cesium 137, the longer acting isotopes?

What about measurements in fish? That was mentioned today, but it is well known that people eat the fish they catch, even if it is in contaminated water.

08-9 Until such time as the government can promise to protect present and future generations, Peach Bottom should not have its license renewed. Thank you.

Oh, one other thing, for those of you who don['t have much knowledge about nuclear waste, I suggest you read the July 2002 issue of National Geographic.

It was written by an ex-Marine officer who believes in the defensive mechanisms of nuclear, and he is appalled at the waste across this country. It is an excellent article. Thank you.

FACILITATOR CAMERON: Okay, thank you, Marcia. And if after the meeting, perhaps one of the NRC staff could just talk to Marcia about the availability of the records that she was talking about. They should be public, but we will find out if they are.
Paul Gunter.

PBD01

MR. GUNTER: Thanks, Chip. My name is Paul Gunter, I'm the director of the Reactor Watchdog Project for Nuclear Information and Resource Service.
I would like to focus my comments, tonight, on the environmental impact statement as it relates to one specific structure, the containment.

In 1972 the United States Atomic Energy Commission, their top safety advisor, Steven Hanaver, in a confidential memo to the general, regarding the General Electric Mark I containment pressure suppression system, as used at Peach Bottom, concluded that the safety hazards inherent in the GE containment design were preponderant, in excessive prevalence, and recommended that the Atomic Energy Commission not permit any more designs to be built.

Joseph Hendrie, later to become chairman of the AEC successor agency, the Nuclear Regulatory Commission, wrote in an internal response that banning the Mark 1 pressure suppression containment could well end nuclear power and "would generally create more turmoil than I can stand thinking about."

01-4

The AEC then issued operating licenses to Peach Bottom 2 in 1973, and unit 3 in 1974. By 1985 the Mark 1 boiling water reactor, or BWR, was again singled out by the NRC for special attention, because of strong indications of a high probability that its containment would not survive several accident scenarios.

01-5

NRC director of nuclear reactor regulation, Harold Denton, told an industry conference that the Mark 1 has a high probability, as high as 90 percent, for some accident sequences, such as an overpressurization accident.

01-6

And as one NRC staffer described, the containment's effectiveness, in an over-temperature accident, core melt, as "like a hot knife through butter."

By 1989 the NRC and the boiling water reactor owners, including Philadelphia Electric Company, began work on the Mark 1 containment improvement program.

With NRC approval Peach Bottom's operators installed an 8 inch diameter pipe, or hardened vent, that can be opened from the control room, to vent the reactor's primary containment through the 300 foot tall stack, bypassing the station's radiation filtration systems.

Operators at Peach Bottom now have the option to deliberately vent Peach Bottom's containment to the environment through controlled releases of the tremendous internal pressure of a nuclear accident, and its radioactive materials, such as noble gases.

01-7 Vent containment to save it. A botched design, a proposed ban by its own safety officials. Its primary containment system later verified to have an irreversible design flaw. A principal safety boundary jury rigged, and Peach Bottom was given its first new lease on life with significant reduction of its often touted defense in depth hardware and philosophy.
Today these badly designed and deteriorating reactors are being relicensed for an additional 20 years only if increased risk of adverse environmental impact to our safety, and the economy, and the water, and the land resources.

01-8 The environmental impact statement does not address security concerns regarding the structure vulnerabilities of Peach Bottom's elevated irradiated fuel storage ponds.
Every refueling cycle Peach Bottom's operators offload one third of the highly radioactive, and extremely hot nuclear fuel from the reactor core, and submerge it into a 40 foot deep elevated storage pond, for thermal cooling and radiation shielding, for a minimum of five years.

The Peach Bottom elevated storage ponds are located approximately between the sixth and the tenth story of each reactor building. Referred to as the spent fuel pool, in industry jargon, each storage pond is currently filled with hundreds of tons of high level radioactive waste.

01-9 As long as the reactors are operating they are constantly cycling thermally hot radioactive fuel rods into the attic of the reactor. It is NIRS stated concern that these elevated storage ponds are extremely vulnerable to a variety of acts of sabotage, radiological terrorism.

The environmental impact statement does not adequately address the increased risk by significantly extending the Peach Bottom operating license, and the adverse environmental impact associated with a successful terrorist attack on this vulnerable target.
As reported by NRC's own technical study on spent fuel pool accident risk at decommissioning nuclear power plants published in October 2000, before the attack on the World Trade Center, and the Pentagon "Mark 1 and Mark 2 secondary containments generally do not appear to have any significant structures that might reduce the likelihood of aircraft penetration of the spent fuel

pool. Although a crash into one of four sides of the BWR secondary containment may be less likely to penetrate because other structures are in the way of the aircraft."

In other words, the Peach Bottom's 40 foot deep spent fuel pool shares only one of its walls in common with the exterior of the reactor building.

NRC goes on to state, based on studies in NUREG CR 50.42, the evaluation of external hazards to nuclear power plants in the United States, "it is estimated that one of two aircrafts are large enough to penetrate a five foot thick reinforced concrete wall."

01-10 The NRC report goes on to state: "It is further estimated that one of two crashes damage the spent fuel pool enough to uncover the stored fuel. For example, 50 percent of the time the location of the damage is above the height of the stored fuel."

As stated earlier, the top of the reactor building surrounding the open surface of the spent fuel pool is basically a sheet metal siding with specified blow-out rating.
Now, basically, this references the blow-out panels that are around the top third of the reactor building. These are basically sheet metal siding that are rated to blow out at a quarter pound per square inch.

01-11 This raises the question for NIRS, what is the blow-in rating for such, for this particular section of Peach Bottom? Where has NRC structurally analyzed this section of the reactor building and evaluated the degree of risk associated with extending the time at which we are vulnerable to the consequences of off-site radiation releases from an act of radiological sabotage at Peach Bottom?

NIRS contends that the identified vulnerability is an unacceptable risk, with unacceptable consequences, in the clear and present danger of a post September 11th world.
A relicensing proceeding that turns a blind eye on this glaring vulnerability is a sham on the public health and safety, and the environment.

There are copies of this statement out front, and I will also submit a copy to NRC.

FACILITATOR CAMERON: Great, thank you Paul, we will attach that to the transcript, also. Sandy?

MS. SMITH: Good afternoon. I would like to comment, I didn't even think about it until I was standing here, listening to everyone's speeches. But my grim reaper outfit was made very quickly last night by my daughter, who is in theater, and so forth. And I was pregnant with Gretl

when TMI was 30 minutes from meltdown. So I guess this is a very apropos outfit that, in fact, I do wear to this. The grim reaper needs her glasses.

FACILITATOR CAMERON: And this is, I'm sorry, I didn't fully introduce you for the record, Sandy Smith.

PBD03

MS. SMITH: And I'm a member of Pennsylvania Environmental Network, and the human race.

03-3

Thank you for letting me speak today. Although I'm angered that this old nuclear plant is even up for the license renewal, the NRC's own standards stated Peach Bottom was supposed to close 30 plus years ago.

What has changed? Has anyone from the NRC personally inspected every piece of rusty metal, worn parts, fractured cement? There is no way Peach Bottom can operate safely, or economically, and should be shut down, according to the Nuclear Regulatory Commission's own figures.

When death, health, and environmental desolation are added up, Peach Bottom is not a cheap source of energy, only a cheap way for the owners to make billions.

03-4
03-5

Is Peach Bottom required to put up a bond, and for how much? Is there any insurance for an accident, and what amount of insurance? What will happen if and when the plant becomes so unsafe that our land values go down, and we can no longer live here?

03-6
03-7

Will the owners of Peach Bottom go into bankruptcy, like Enron? What will happen, who will pay for all this? According to the Federal Register Notice, each relicensing is expected to be responsible for the release of 14,800 person rem of radiation during its 20 year life extension.

03-8

The figure includes releases from the nuclear fuel chain that supports reactor operation, as well as from the reactors themselves. The NRC calculates that this level of radiation release, spread over the population, will cause 12 cancer deaths per unit.
And I think I figured that wrong, because I thought per unit meaning per nuclear facility, but we have two units here, so I guess that is maybe 24 deaths, instead of 12, I'm not sure about that.

Accidents and non-routine radiation releases are not included in the NRC's figures, and could cause still higher casualties. The NRC only calculated likely cancer deaths.

So deaths from other radiation induced diseases, and non-fatal cancers, are not included in the calculations. I don't think there are 12 people in York County willing to give up their life for Peach Bottom. And TMI is close by.

The NRC has said it expects as many as 100 reactors to apply for relicense extensions. This would result in some 12,000 cancer deaths among the U.S. population, but probably more because of the miscalculation on units.

03-9 Pennsylvania also has, is the second highest number of nuclear reactors, and is the second highest amount of nuclear waste. Because of this Washington says we have to have a nuclear dumping site.

Pennsylvania doesn't want a nuclear dumping site, so why do we have this reactor going off, why are we creating more nuclear waste?

03-10 Nuclear power is not an admission free technology. The entire nuclear fuel chain, the uranium, primary mines on the lands remaining to the indigenous people, uranium conversion, enrichment, fuel fabrication, each step possesses workers, exposes workers and communities to radioactivity, and each step generates radioactive waste.

03-11 It defies the concept of disposal, they don't go away, they just get moved around. There is no such thing as a nuclear dump that won't eventually leak. The NRC acknowledges that the allowable limit, 100 milli rems a year, for radiation exposure, via air, from any reactor to the general public, will cause a fatal cancer in 1 out of 286 people exposed.
This is very high when compared to the standard of 1 in a million considered an acceptable level of human sacrifice for industrial activities.

The 1986 catastrophe at Chernobyl has seriously affected the health and welfare of the byelorussian people. I was there, I met them, I know what I'm talking about, I saw the children.

The average life expectancy of women has declined by five years. Only ten percent of the children are completely healthy. Cancer among adults and children have increased in Ukraine and Moldova as well. Two-thirds of Ukraine is contaminated, and 70 percent of the food.

The watershed of Kiev basin has been so contaminated that it would require 200 billion dollars just to purify the water. 40 million people have to drink it and, yes, they are drinking it now. Children are drinking it, everybody is drinking it now.

03-12 TMI was 30 minutes from meltdown. How much disaster insurance does Peach Bottom carry for York County? We have a right to know. Are you going to pay for our land when it becomes useless? What will happen?

NRC has offered to pay the cost for two day's supply of potassium iodide pills to people living within ten miles of a nuclear power plant. And this is not Laugh-in, or Friday Night Live, this is really it, or Saturday Night Live.

Thyroid cancer is a major result of nuclear accidents. The exposures can continue for days, even after one leaves the area. It is in your blood, and so forth.

If a nuclear accident occurred during a natural disaster, earthquake, hurricane, blizzard, ice storm, or an attack, evacuation would be difficult and time consuming, and people would need at least ten days to a month's supply.

EPA's manual even states that it should be taken, the iodine tablets, three or four hours after the exposure if it is really going to work.

03-13 The NRC would also have to stockpile iodine pills in schools, day care centers, places of work, and so forth. Soaring rates of thyroid cancer are still appearing in children from the former Soviet Union, who were exposed to Chernobyl nuclear accident, and who received too little potassium iodine, and too late.

03-14 There is no way, even the seemingly simple protection can be carried out. Why do our tax dollars have to pay for Peach Bottom, a private company, hazardous operation?

In the past three years older, worn out equipment has caused dozens of accidents in plants, causing them to shut down. In May and August of 2000, Peach Bottom unit 3 was forced into an emergency shutdown when its instrument valve failed, and caused a leak of contaminated reactor coolant outside of primary containment.

03-16 Much to the discussion, since the September 11th attacks, has focused on the resistance of reactor contaminant structures to aircraft strikes. I wonder about Peach Bottom. We all know it was built way too long ago, it won't hold up.

We must assess the nuclear age itself in the wake of Chernobyl. These children are still going to Kiev, they are going to Israel for decontamination, coming back, and then suffering from radiation over, and over, and over again. But the mushrooms are big, let me tell you.

03-17 We must asses the nuclear age very carefully. There are more than 450 reactors in operation on the planet today. Each generates radioactive waste that will be a threat to human life for hundreds of thousands of years. That is everybody's children. Each routinely releases radioactivity into the air and water. Poland was the only country that protected their children with iodine pills. And that is not a polish joke.
To this day Scotland, sheep in Scotland are contaminated, and the land is contaminated from Chernobyl.

We have seen how far radiation can spread, which depends on the wind. We have also witnessed smoke from the CaPBDian forest fires. Radiation travels the same paths.

03-18 If nukes are so safe why do our phone books have an evacuation route, why is the industry trying to figure out where to dump their deadly waste, and why is 46,000 dollars of your county's budget, our money, going yearly to radiation emergency response?
If the NRC does not close down Peach Bottom we will not have to worry about the terrorists, because we have our government representing the corporate world of nuclear energy already terrorizing us.

Thank you, let's hope we can stop this.

FACILITATOR CAMERON: Okay, thank you Sandy. And the next three speakers that we have are Donna Cuthbert, Alliance for a Clean Environment; Sam McConnell, and Lawrence Egbert, from International Physicians for Prevention of Nuclear War.
Donna?

PBD09 MS. CUTHBERT: I am here today to address the common sense issues of this problem. The Alliance for a Clean Environment is a group founded in the greater Pottstown area, which is focused on harmful environmental health impacts in our region.

In the greater Pottstown area there is an enormous elevated childhood cancer rate. We also live right at the Limerick nuclear plant. It has been found that in our county there is an elevated cancer rate of childhood cancer deaths, ages 1 to 14, that have increased by 71 percent, from the '80s to the '90s.

Is it the Limerick nuclear power plant? Who knows, but it certainly had a part in it. Thyroid cancer has increased in the general population by 96 percent from the '80s to the '90s in that county, where we have the Limerick nuclear power plant.

09-1 Based on Peach Bottom's threat to human health and safety, as well as long-lasting destruction of our environment, we urge the Nuclear Regulatory Commission to deny the license renewal for Peach Bottom.

09-2 Closing Peach Bottom is clearly in the best interest of the health and safety of all residents in this region, and the best economic interest of the public, in general.

09-3 The President keeps reminding us that our war on terrorism is not likely to end in the near future, if ever. Why would the NRC renew the license for such a major target for terrorism? The potential to destroy so much, and harm or kill so many people must be ended, not renewed. Even people in the greater Pottstown area could have their health adversely impacted by a terrorist attack, or accidental disaster at Peach Bottom.

Pottstown is only about 50 to 55 miles from Peach Bottom. If prevailing winds blow only about 10 miles per hour, radiation can arrive in Pottstown in as little as five hours.

09-4 Why would the NRC renew the license of any nuclear plant, when it costs the public so much money to protect these facilities from terrorism? How long can we afford to absorb that kind of cost?

09-5 What kind of debt would we be planning to leave for our children, and their children, just for the constant surveillance of nuclear plants?

09-6 Why would the NRC renew the license for any nuclear plant when there is no safe way to dispose of the radioactive waste these facilities produce?

09-7 Spent fuel rods present enormous risks to public health and safety, to store, or to transport. When spent fuel rods can't be disposed of safely, why would the NRC allow the process to continue, which produces more of them?

09-8 Transporting spent fuel rods from nuclear plants such as Peach Bottom in Pennsylvania, across the nation to Yucca Mountain, opens the door for all kinds of natural and terrorist catastrophes all along the way.

09-9 Leaving the nuclear waste on site presents additional risks to the surrounding populations. We face far, far too much risk from nuclear waste already. Common sense tells us that the older the nuclear plants get, the more chance there will be for accidental disasters. Why would the NRC allow this increased risk?

In 1990 the National Academy of Science report called the biological effects of ionizing radiation stated that even, even quick decaying radiation is not necessarily safe.

09-10 Realistically there is no safe level of radiation. Why do we play these safe level radiation games? Why do we do that?

Nuclear power plants contain a toxic soup of extremely carcinogenic radiation. There is no way, there is no way to protect people from the ongoing radiation releases at a nuclear facility.

There is also no way to protect people from exposure as a result of a nuclear accident. Realisticaly this is not truly a guarantee. Some kinds of radiation from nuclear power plants remain in the human body forever.

09-11 So why would we continue a process when we know it does this kind of harm to human health? I believe Peach Bottom has the potential to be an enormous, enormous health risk.

09-12 In fact, even people who live in Pottstown could ingest airborne particulates routinely escaping from Peach Bottom. The Pottstown area gets much of its milk from dairies located in Lancaster and York counties, near Peach Bottom. And people ingest Peach Bottom milk.

Logically speaking it is irresponsible, and illogical, to extend the life of Peach Bottom. ACE urges you, urges you, to protect the enormous population which can be adversely affected by what happens at Peach Bottom.

09-13 Please, please, value the health and the environment. Please deny Exelon's application to extend Peach Bottom's license. Thank you.

FACILITATOR CAMERON: Thank you, Donna. Is Sam McConnell with us? Sam, do you want to come up and say a few words to us?

PBD10

MR. MCCONNELL: My name is Sam McConnell, I'm a local resident, and I'm concerned and presently involved with local environmental, health, welfare, and safety issues.
My background that allows me to, in my opinion, to become involved and voice my desires, is I have 20 years in military nuclear power, including operation and maintenance, RADCON, radiation control, setting up checkpoints, radiophysics, nuclear physics, and more importantly, probably, from a standpoint of understanding what happens, I was the team leader for the nuclear power plant casualty response team.

I have one year of environmental assessment of a fossil fuel plant permit application to PADET. I'm not now, or have ever been, involved financially with any commercial electric plant.

I personally have been through the Peach Bottom application, its environmental impact volume twice, which is rather boring, but I did it. The safety volume, once, because I can understand what they are talking about. And the draft impact assessment, once.
Unfortunately family got in the way, and I couldn't really tear it apart and digest it like I would have liked to.

10-1 As of today I'm personally in favor of approval of the application, as a local, for the following reasons.

Extending the license will be less of a local health, welfare, and safety impact than constructing a new plant, either nuclear, or fossil fuel.

10-2 The findings, the second reason is the findings of ongoing studies that show that fossil fuel plants emissions are considerably more damaging to the local health and welfare than previously thought.

Personal experience with the NRC oversight and control, for 20 years I had to live with them, and it was not easy, in the service. And NRC has been involved in monitoring nuclear power plants, and the military will tell you that it is rather grueling, what you go through, dealing with the NRC.

10-3 The fourth reason is because Peach Bottom has been a good neighbor. I've heard questions about release of information. I have news for you, we knew about the operators sleeping, as soon as it happened.

So far as I know we've known about every problem Peach Bottom has had. That is local information.

10-4 In summary, because I live here, in the real world today, and know that another plant will fill the void

less by Peach Bottom shutting down, I'm in favor of the licensing extension as more desirable than new construction of more nuclear reactors, or a fossil fuel facility, that would take their place in this void.

Because, unfortunately, we are in the Susquehanna river basin, and we will see, in fact today we generate more electricity, probably, than any other place in this country.

10-5 I've done the DOE studies, and we generate 17 percent more power than we can use in Pennsylvania, and we are doing it for people who don't live here. So we are getting the emissions that would have to come from a fossil fuel plant, right here, with no benefits. Thank you.

FACILITATOR CAMERON: Thank you very much, Mr. McConnell. And now Lawrence Egbert. Is it Dr. Egbert? Yes, Dr. Egbert could come up and speak to us.

PBD11 DR. EGBERT: My name is Lawrence Egbert, I'm a physician licensed in Maryland, and I live in Baltimore. I'm told that Baltimore tends to be downwind from here, but maybe Pottstown is worse.

I work with the International Physicians for the Prevention of Nuclear War in Texas, and we became very interested in the transportation of nuclear waste across New Mexico, and then evaluated, the Veteran's Administration evaluated the training of the physicians in the various hospitals along the route where waste would be transported.

And found that in New Mexico, at any rate, they weren't. So the physicians weren't trained to take care of the casualties, radioactive casualties, if a truck happened to have an accident in carrying the waste through their particular town.

We did a similar, but not as thorough, a study of the transportation across interstate 40 through Oklahoma, and also interstates 30, 10, and 20 in Texas, and basically came to the same conclusion.

11-1 If you have an accident with one of these trucks carrying the waste, do not expect us to be capable of good care. So I'm sorry about that. As far as I know, at the present time, it is still in the state of lack of preparedness.

11-2 I would say another thing about Baltimore. Baltimore had a little accident last summer, in one of our tunnels a train carrying chemicals, so that we are a little sensitive about the possibility that any waste materials that might come from here, might come down interstate 95 and maybe go through some of our tunnels.

The U.S. chapter, I'm from the Baltimore chapter of the International Physicians for the Prevention of Nuclear War, but our national, United States national chapter, has explicitly said do ont transport your waste to Yucca Mountain.

11-3 And not just for the reasons that I'm telling you, we are not prepared to take care of the casualties if there is accidents, but because of the general idea of terrorists, and also the idea that the waste, if you are going to carry the waste, if you are going to create the waste, then it is best to have it stored at the most local site that there is, in terms of general hazard.

11-4 We would, therefore, come to the conclusion, especially in Baltimore, and our steering committee has authorized me to tell you, keep your waste here, don't bring it through Baltimore, which is essentially saying close the plant down, and don't make any more waste.

Thank you.

FACILITATOR CAMERON: Thank you, Dr. Egbert. We have four remaining speakers, and possibly we will have some time, if Dr. Johnsred wants to talk to us for a little bit.

But we have Frieda Berryhill, Bernard August, Amy Donohue, and Mike Ewall. Frieda?

PBD02 MS. BERRYHILL: When you started you told us of the experiences of the people with the NRC, and years of service.

I was an intervenor when Delmarva Power and Light Company planned to build a nuclear power plant in Delaware, and that was in the early 1970s, and I've been at it ever since.
So as far as years of study, and interest goes, I'm older than all of you. I have read more documents than you can possibly imagine.

As a matter of fact, when we got started Dr. Judy Johnsred and I were young and beautiful. Now we are only beautiful.

I'm well aware that these hearings, we have been to so many CYR hearings, Ms. Johnsred and I, you can't imagine, and how many papers we have submitted, and how many studies we have read.

CYR hearings are called public hearings. We have no delusions that our being here has any effect on anything, never has had. The nuclear industry self-destructed, not because of our efforts, and we know that. But it is our religion, it has become our religion, you see.

Well, Peach Bottom at this time is one of seven nuclear power plants with active relicensing applications. Four plants have been licensed so far, and there is no indication that any statement in our position to this dangerous practice has any impact at all.

02-2 As a matter of fact, having any new, having no nuclear power plants to work with, the NRC's willingness to keep their jobs going, with the same disregard for safety concerns, and concerns by opponents, is quite clear.

Some years ago one of the NRC men said to me one time, well, no more new plants, we are out of a job. Well, now you are safe for God knows how many years.

02-3 Most licenses do not expire for another 15 to 20 years. So I ask myself why now? The present license hasn't expired, and they are already apply. Don't you want to know why? To amortize the plant's debt further, further into the future.

Therefore padding corporate revenues today. The NRC knows that, we know that, everybody knows that. This old worn and dilapidated plants originally licensed for 30 years, which was then considered to be reasonable. Having an extension for that reason only, keep the money going, just follow the money, and you have the answer.

02-4 To make my point, cracks and leaks, and embrittlement of the material in aging plants is well known by the NRC. Nozzle cracking in the pressurized water reactors started in the late '80s, and only two months after Oconee was given the 20 year extension, the nozzle cracks were discovered.

And I have an explanation, in the back of my statement, for anyone that wants to read it, what those nozzle cracks are.

02-5 And, again, after extension the nozzle cracks were discovered. And earlier this year Quartz City in Illinois reported a problem with those. And that is a dangerous problem. I urge you to read them.

Two other plants currently going through licensing process where cracks were found, that is North Anna, and Surrey. On March 7th, 2002, First Energy's Besse-Davis nuclear power in Ohio experienced the problem, which should alert the NRC to immediately halt all renewals. Boric acid corroded a six inch hole into the reactor vessel, leaving only a third of an inch metal cladding as protection against the reactor breach. The consequences could have been devastating.

And they discovered this by accident. I'm certain you will not permit me to list all the so-called close shaves and mishaps, and sloppiness with which this industry operates. Stupid mistakes with regularity.

At General Electric's Trojan plant the control room operator was listening to a baseball game while radioactive water was overflowing from a tank, and flooding the adjacent building.

On July 26th at Susquehanna a dry fuel storage cask had accidently been filled with argon helium gas in its place, instead of the correct 100 percent helium gas. Nobody knows what the effects on the storage system are, of this.

Now, how can you make a mistake just -- it is beyond imagination.

Finally, I would like to direct the NRC's attention to the international situation concerning nuclear power in general. And the reason I do this is because in all the 30 years we were told how wonderful the French have their nuclear program under control.

And the French nuclear power program from Framatome has been held up as a marvel. But the chickens are coming home to roost. With an original price tag of 4.3 billion dollars, the Phoenix ran for a total of 30 months, over a dozen years since it went into operation. And the world's largest fast reactor is now closed for good. And that was the model held up to us for all these years.

And, by the way, the breeder reactor in Japan are no better. If the serious accident investigating general commit suicide. We are finally beginning to look into the nuclear industry's claim as to the actual contribution to the nation's energy pool.

02-6

And this has not yet hit the national consciousness. But there are groups now working on this, and this is very interesting. The production of nuclear power is extremely energy intensive.

The energy consumed by future needs, such as shipping 77,000 tons of nuclear waste all over the country, much more being produced, this doesn't even figure into the calculations. If the trillion dollar taxpayer investment, it delivers little more energy than wood.
Globally it produces less energy than renewables. In the 1990s global nuclear capacity was only one percent a year, versus 17 percent for solar cells, 24 percent last year, and 24 percent for wind power.

Last year California added more decentralized megawatts than its two nuclear power plants. Does anybody really want these plants?

Over the last few years utilities have been trying to sell them. Maine Yankee even created a white page complete with color photographs to promote the sale. There were no takers, the plant was retired.

02-7 When will this country find its sanity? Its sanity. What are we doing to this planet? Plutonium is radioactive for 250,000 years, and some elements like iodine and tecnitsium won't decay for millions of years.

02-8 I think it is time to stop, and maybe I will be here another 10 or 15 years. Thank you.

FACILITATOR CAMERON: Thank you, Frieda, and we hope you are here with us for another 10 or 15 years.

I should just say that we are here to listen to everybody today, and if there are comments made that need to be factored into our environmental or safety reviews we will do that, and that is the main purpose for why we are here.
Our next speaker is Bernard August.

PBD12 MR. AUGUST: My name is Bernard August, I've been an activist for 37 years.
Of course I'm a really good activist, because I was trained by Mrs. Berryhill. So I want to give her credit for sticking my neck out like this, and not giving up.

My specialty has always been to study the social consequences of this technology in relation to evacuation zoning, and the study of these plans. These plans are totally required by law, in each state, to comply for a nuclear power license.

12-1 But the evacuation planning is a farcical project in itself. There is no way that anybody escapes out of a ten mile EPZ safely, within a certain amount of time.

Because what is expected of the society that live around the plant, is that they are giving proper notice that the accidents occur, and evacuation will be forthcoming.

12-2 The social consequences of a nuclear evacuation has been underplayed and on the side line for the last 30 years. It really has come to fore because of 9/11, and now the redistribution of potassium iodide tablets.

12-3 This idea that people will evacuate under some sort of system is completely baseless and irrelevant.

12-4 There has been reports that come from the accident at Three Mile Island, whereas earlier the doctor mentioned about not having adequate physicians, and people to use in the evacuation. Will they be around?

12-5 This has been determined that nuclear accidents are not the same as natural disasters. People who are responsible, who want to be, the system relies for their jobs to show up, will not show up.

Out of the doctors that were reported to show up for Three Mile Island, 70, I think only five or six showed up. That doesn't include the people who are going to have to drive the buses to bring the people out of the zone, the traffic police, and whatever.

12-6 And what is going to happen if a nuclear evacuation is called? There is going to be spontaneous evacuation outside the ten mile EPZ, further jamming up the highways, and making it impossible for anybody to get out.

12-7 So as I always say at these hearings, when I go to them, is that the least you can do is to tell the people to stay put in their houses. Because being on the road, in a disaster such as a nuclear accident, will lead to further loss of life, and environmental destruction.

12-8 KI must be given to all the populations within at least 50 miles of the plant. I think the new federal law stated that because of the war in terrorism, the Homeland Security Act, that the evacuation plans are going to be extended to 20 miles now, instead of 10.

I live in Delaware. I am surrounded by approximately six or seven nuclear power plants on all sides. There is no way in hell that I'm going to get off the Delmarva Peninsula, and there is no way in hell that they are going to be able to distribute KI to me, after the announcement has been announced.

So, therefore, the social premise of nuclear power, the fact is that it receives multi million dollar subsidies to keep it operating, is a sham, and a technologic lie.
Human nature cannot permit, does not permit perfection in its though process, and its designs, of such an egregious technology. It cannot be achieved.

12-9 The idea that technocrats, bureaucrats can sit down and degrade human liberty and freedom to an

insurance risk assessment is totally bizarre. And I know our lives are lived this way in this country, because everybody has their ox to protect.

12-10 But as the technology has proven, with its people who are in pursuit of nuclear weapons, and the security structures that are required for nuclear technology can't, and will never be there, for the total protection of the population at large.

Thank you.

FACILITATOR CAMERON: Thank you Mr. August. Do we have Amy Donohue?

PBD13 MS. DONOHUE: I was going to prepare a written statement but I got a little frustrated with it, so you will have to bear with me.

After the last meeting that the NRC held here I submitted, probably, an 18 to 20 page report to them. And I prefaced that report with the following statement:
I said, first of all let me be clear. I know that it doesn't matter what I say, or what anybody here says, during this process to relicense Peach Bottom nuclear power plant.

The regulations say you, meaning the NRC, has to get public input. So you let us have our say. But in the end the decision will be made despite anything we have to say.

Sometimes I really hate being right. I've put a lot of work into 18 pages, and what I've read in the draft environmental impact statement totally negated everything that I said.
I haven't read the entire thing because I haven't had that time yet. But I had a particular interest in alternative power, because I live off the grid. I make all my own electricity by solar panels, solar photo-voltaic panels. I buy no electricity from PECO.

So I've turned to page 8-43, to read what you had to say about solar power, I was quite amazed. Running Peach Bottom nuclear power plant for 20 more years, you are telling me, has a small environmental impact.

13-1 But to replace nuclear power with solar power, you are telling me has a large environmental impact. Quite amazing. How can you say this and get away with it?

I'm serious, I mean, it is laughable, if it weren't so serious. I was planning to have a poster sized photograph of my panels, but time ran out, so I don't have that.

If anybody is interested, let me know, and I will share with you the great possibilities that solar power has for us.

Underneath what it says about solar power is that it costs too much per kilowatt, I guess that is how it is. Well, let's talk about that, because I know that our federal government, meaning me the taxpayer, subsidizes the nuclear power industry quite a bit.

13-2 Everything from the insurance that Peach Bottom has that all nuclear power plants have is paid for by me, the taxpayer, through the federal government. Is the Federal Government going to pay my insurance? I don't think so.

13-3 The other thing is we fund the nuclear regulatory industry through our taxes. I don't know how much you all make, but I bet it can buy a lot of solar panels.

13-4 Let's see, Yucca Mountain. If you decide to put that waste at Yucca Mountain how much are you planning on spending to do that? How much do you spend in regulation and cleanup from the mining of uranium?

I mean, you put all that money together, it can buy a hell of a lot of solar panels. I make all my own electricity with just a few. That is quite a lot of solar panels that can be bought.

I know all this because I do a lot of reading. But as I was preparing this afternoon to come here, actually this morning, I was going through trying to find a phone number, and I came across something that is called Pennsylvania Solar Manual, and it is produced by the Pennsylvania Energy Office.

So this is a Pennsylvania government publication. Within that, let me see if I can find it very quickly, in that manual it says, so this isn't coming just from me, it is coming from our state government.

Present day energy suppliers benefit from billions of dollars in subsidies. And this was published in 1993, so that is 1993 dollars, I guess, we are talking about.

13-5 It is estimated that over 50 billion dollars per year is spent by the Federal Government in directly subsidizing the costs associated with fossil and nuclear fuels.

13-6 These subsidies take the form of tax breaks, research and development, environmental cleanup, health costs, and military expenditures to ensure energy supplies. These costs do not show up in the price we pay for energy, but we pay for them just the same.

We pay for them in our tax dollars, we pay for them with our lives, in cancer. If these hidden costs, often referred to as externalities, were included in the price we pay for energy, then solar energy would be in a far better position to compete with conventional fuels.
So it is not just me saying that. I, like I said, have a particular interest in solar because that is the way I live. And the reason I live that way is because I don't want to buy my energy from a nuclear power plant.

I live eight miles, approximately, from Peach Bottom. I hear the sirens go off, I have probably called the emergency number in our telephone book too often because sometimes I think I hear them, and I'm not quite sure, so I call to make sure.
I hear them in the middle of the night in the last couple of years. There was no emergency, it was a mistake. I said it at the first meeting. We live in a state of denial in the shadow of this nuclear power plant.

13-7 Somebody else is talking about how we will evacuate. I live next door to an amish family, lots of buggies here, lots of buggies. Very dangerous, normally, on route 74 with those buggies. I can't imagine evacuating all the people from this area.

You know, I have an interest in organic farming. If that melts down, if we get contaminated, that is gone. My land is useless for that, useless for pretty much anything.
So I want to get back to solar, I'm going off here, I'm sorry. The other thing you said about solar is that we don't have enough sun in Pennsylvania.

So I found it, again, Pennsylvania Solar Manual put out by the Pennsylvania Energy Office. I know we have enough sun because that is the way I get my electricity.

13-9 The amount of solar energy striking Pennsylvania each year is 140 times greater than all the electrical and fossil fuel energy consumed in the state annually.

Even if the conversion efficiency of sunlight to energy is only 5 percent, solar energy could still supply 7 times more energy than is consumed.

Yes, we have a lot of cloudy days, but the sun does come up every morning. There is no way for my solar panels except for, oh, maybe 20 years from now I may have to replace the batteries.

But those batteries can be recycled. They are not going to create cancer to populations around the country, around the world.

The panels that I use are by a company called Astropower. And Astropower is an independent solar panel company, and they produce their panels from recycled materials from the computer industry.

So even the materials used to make the panels is good for the environment, because they are using recycled materials.

13-10 So when I read that the environmental impact of replacing nuclear energy with solar power was large, and the impact of continuing Peach Bottom for 20 more years was small, I was totally blown away.

I don't need to read the rest of the report although I will, and I will submit, probably, another 20 page comment on it, to know that there is not a whole lot that I'm going to believe in that report.

13-11 Because this was just four paragraphs in your report. I wonder where you got all your information from? The numbers that are cited have NRC in parentheses. Since when is the Nuclear Regulatory Commission experts on solar energy?

I can give you, right now, names, telephone numbers of people who are experts on solar energy. I've spoken with them, they would agree to talk with you, they would agree to talk with the press, because they have studied it, they know. They are the experts.
You may think you are experts on nuclear industry, but you are not on solar.

The other thing that I want to say, just briefly, is somebody else Sandy, I believe, talked about the twelve extra cancer fatalities as a result of each unit for another 20 years.

13-12 If somebody came into this room with a gun and killed 24 people in this room, promised not to kill anybody else for the next 20 years, would we allow them to walk out? Would we allow them not to be held responsible for those 24 lives in this room?

That is what the Nuclear Regulatory Commission is saying, that they are going to give a license to Peach Bottom to continue to do, 24 deaths.

I would like to see the hands of 24 NRC or Exelon personnel, right now, who would be willing to give up their lives. Because you are asking us, those of us who live here 8 miles from that power plant, to do that.

FACILITATOR CAMERON: Amy, I guess I'm going to have to ask you to wrap up.

MS. DONOHUE: Okay, I'm done.

FACILITATOR CAMERON: And if you have the patience and willingness, maybe, after the meeting the NRC people can talk to you about what methodology was used in terms of the solar analysis, and we appreciate your comments on that and, thank you.

And we have Mike, Michael Ewall, now, to speak to us. Mike?

PBD14

MR. EWALL: My name is Mike Ewall, it is E-W-A-L-L, with the Energy Justice Network.

I testified back in November, and from my experience there I know that my comments will be ignored, because my comments were ignored then. And they actually told me why, so they weren't even pretending they were going to take them into consideration.

I spoke the last time about terrorism impacts, and I was told that that was not something that we are allowed to really give comments on. Not that we are not allowed to give comments to, but that we are not going to be listened to and, obviously, none of it ended up in this EIS report, because that is being handled in a separate process that is generic to all reactors.

14-1

And while that is admirable that you have that, I think it would also be appropriate to have site specific terrorism impact information in here. You talk about -- you had a great acronym for it, severe accidents.

14-2

But there is nothing about severe, like, deliberate damage being done to this reactor. And as Paul Gunter gave, on some very clear testimony on the vulnerability site specifically to this reactor, I think that needs to be addressed.

I don't have any illusions, either, that my comments are going to affect this in any way. I know also because some other things I said the last time about solar and wind, and conservation efficiency, also did not make it into this report.

14-3

I will go more into that in a minute. One of the things that I think need to be addressed in here,

though, that I just looked through this and noticed, is that there is nothing addressing the spent fuel, and where that would go.

And even if Yucca Mountain is built, and even if it manages to ship all the waste there with no accidents, and all these things that we are all hoping, some people are hoping would happen, I don't want to see Yucca Mountain at all.

14-4 But even if that happens Yucca Mountain is not going to have room for the waste that would be created in these extra 20 years. So you need to be talking about this in this report. Where is that waste going to go?

Because Yucca Mountain is not for that waste, it is only for the waste up to a certain point. Now, if a lot of that waste has to be temporarily stored in dry cask storage, we have a number of oops, mistakes, going on with dry cask storage, including one from just this past week.

14-5 Actually Frieda already made mention of it, in Northeast Pennsylvania, where they filled the dry casks with the wrong gases, argon and helium instead of just helium.

Now the NRC report from that stated that they don't know what impacts that might have, but it might degrade the effectiveness of these containers. And these are containers that we do not have the technology, or ability to repackage this waste, to put it back in the fuel pool.

14-6 So without those kinds of alternatives it is a big deal that they are filling these casks with the wrong gases. And in Point Beach, Michigan, and Palisades, you have the same kind of -- not the same kind, but you have other dry cask storage incidents with hydrogen bubble explosions, and wind several times blowing several feet off of the surface, near defective wells with dry casks.

14-7 Now, why are we possibly allowing more of the spent fuel to be created when we can't fit it in this reactor? We are not going to have any place to throw it away, like Yucca Mountain.

14-8 And the dry cask storage facilities don't even work, and they are glaring terrorist targets, and we know this, and I talked about this the last time, it was after September 11th, then too.

And we knew about this well before September 11th, and things got ignored. I'm shocked at how things are getting ignored now.

14-9 The no-action alternative in here I think is the best alternative and ought to be adopted, of course. And if you look, and I just downloaded this, right this morning, from the PJM interconnection website, PJM are the folks that run our grid around here.

And if you add up all the nuclear capacity in this state you get about 9 to 10,000 megawatts of capacity. Now, I have been helping communities fight off all these unneeded natural gas power plants, because Pennsylvania is already the largest exporter of electricity of any state.

14-10 We export so much electricity, I know it is not done on a state by state basis, but how much is generated versus used in each state? Pennsylvania is the largest exporter. And we export so much that we can fill all the deficits in the states from Vermont down to Virginia, and out to Michigan.

So that is quite a bit of excess electricity, and that is not including the fact that West Virginia and a lot of other states also have excess capacity.

14-11 Now, on top of that excess capacity, Pennsylvania has been faced with 50 to 70 new natural gas power plants. One of them right here in the Peach Bottom area. Now, these power plants, first of all, just the one here at Peach Bottom would be at least half as large as the reactors that are already here.

So half the capacity could, theoretically, if they build this plant, be shut down. But that is not being talked about.

Now, on PJM's website they are talking about adding well over 10,000 megawatts each year, in 2003, 2004, 2005. Now, just the -- and this is almost all natural gas. Just the natural gas power plants that are already built, within the recent few years, or under construction, or likely got built.

14-12 And a lot of them have been fought off, withdrawn, or defeated, and I have helped with some of those, I know this pretty well. But even the ones that are likely to go through is more than 10,000 megawatts.

Meaning we can not only shut down Peach Bottom, both units, we can shut down all the nukes in Pennsylvania, and no one's lights are going to go out, no one is even going to notice. We already have such a glut that even with a California style games happening here, by PPL, just like Enron did in California, PPL is being investigated for the same type of wholesale price manipulation.

But the lights aren't going to go out here, because we produce so damn much. And one of the things mentioned in this report, actually let me give another reference for how much extra energy capacity. This is from, and I have extra copies of this.

This is an Energy Industry Conference held in Pennsylvania this past October. I have multiple copies of this. This is the best presentation given by Dave Costello of the Department of Energy, and Exelon is aware of this, because one of the keynote speakers was the head of Exelon.

14-13 The mid-Atlantic region generating capacity in 2001 through '3, you have approximately 20,000 megawatts, maybe a little less than that, being added, according to this.
Now, PJM has a lot more than that. But even in the lower end of these two estimates you have twice as much of all the nuclear capacity in Pennsylvania being filled, mostly by natural gas, in the next few years.

So the no-action alternative already says that this power is getting replaced, whether you like it or not. I don't like the technology, but that is the way it is.

Sorry, I'm reading my really tiny notes to myself, here. Okay, how the 12 year advance permit are needed, in this report -- actually no, not in this report.

14-14 Earlier in the presentation today it was explained that the reason that is being done twelve years in advance is to give Exelon time for replacement power. Now, that is ridiculous because it is already getting replaced, so that is not a legitimate argument.

The replacement power time frame that is needed, even if there was a need for replacing this specific reactors power, could be done within two to three years, because that is the time frame for establishing wind, and/or natural gas, both power plant technologies take only a few years.

14-15 Now, in this report, under wind, it mentioned that ridge lines are unsuitable for winterize. Now, that is the most ridiculous thing I have ever heard. I just came from an energy conference in New Jersey, plenty of folks from DOE and other wind energy people that were there.

14-16 I saw the newer data on this, and hope you are not trying to get me to shut up, because I have a few more points here. There is plenty of wind along the ridge lines, and Exelon knows this, because

community energy is going ahead and building large wind farms in Pennsylvania, some of them on ridge lines.

14-17 Yes, they are deforesting some of them, and there are impacts. However, Exelon knows this because they are funding them. There is a 60 megawatt wind farm going on line in Northeast Pennsylvania. Exelon is underwriting that. There are already two in Southwest Pennsylvania, Exelon underwrote those as well.

There is another one going in, in West Virginia, in the Backbone mountain, another 60 megawatts. That is also Exelon money behind that. So Exelon is not unaware of this. And if you are unaware of this it is because you are not talking to your licensee, because these are their projects, for the most part.

14-18 And so the wind part of this report is woefully iPBDequate, it is scientifically inaccurate, it is just wrong, you need to do your homework. I've seen college reports, bachelor's degree college reports, that are much better documented than this, much better researched.

14-19 The head of the Department of Environmental Protection in Pennsylvania, David Hess, was actually quoted at the Energy Conference where that natural gas presentation was given, saying that using just the decent wind speed sites in Pennsylvania, we can supply 30 percent of our electricity needs in this state.

Now, what he is quoting is from the American Wind Energy Association, which is using Department of Energy data, which is working on being revised, it is not really that optimistic. However, 30 percent is pretty high.

And even if it turns out to be 10 percent, that is very significant, and that needs to be addressed in this report. So you are obviously misgauging the impacts of wind.

14-20 And also, a lot of this is addressing section E, on A-48 you mention over 50 competitive suppliers in Pennsylvania. This report, again, needs to be updated. There were close to 50 when deregulation first hit Pennsylvania, that is before we had PPL doing the Enron-like games here.

Since then competitors have fled as quickly as they can, we have very few suppliers that are left in this state right now, especially for the residential sector. For the business sector we have some, but it is still not looking that good.

14-21 And also on that same page, on page 8-48, there is basically no incentive for Exelon to be pushing conservation in a competitive market. Well, yes, that is a problem, that is a problem with the whole system of having a competitive market for things, when the logic in this report is saying, Exelon is not going to do it, that is not going to happen.

14-22 And that is, basically, the assumption that I saw in here because, otherwise, we can easily talk about methods of conserving enough electricity, and without just looking back at their failed attempts as a utility to work as against their own economic interest.

14-23 And, finally, page 8-49, the very first few lines it says, therefore it is not clear whether Exelon or another competitor supplier will construct new generating units to replace Peach Bottom units 2 and 3 if the license were not renewed.

Again, you are getting at this idea that you have no idea what is going on currently, or if you do, you are not writing it into this report. This power is already being replaced.

14-24 So the whole no-action alternative, the wind, the solar estimates, the conservation efficiency estimates completely need to be rewritten. I've already submitted testimony on this, and it hasn't been incorporated.

And to work off something Amy just said, she mentioned there is 50 billion dollars a year in federal subsidies to fossil and nuclear power, and that is about ten years ago. Only slightly less than one billion dollars, 600 million dollars, 60 million dollars according to a report by KPMG.

That is the cost it would take to build a large scale solar panel production facility, where every year you can crank out the production of 500 megawatts worth of power. So in four years just one factory can replace Peach Bottom and then keep making more Peach Bottom's worth of electricity, but in the form of solar panels.

Now, for that cost, and building it down to economy of scale, actually the question that I wrote for was what size would it take to make solar power affordable? That is the problem with it, and you mention this in the report, that solar panels are not affordable right now.

14-25 Well, building on the economy of scale that would be less than a billion dollars, 6 to 700 million dollars, will bring the cost of solar panel production down by four to five times, so that is cost effective with other forms of electricity generation.

14-26 And when I say cost effective I'm talking about cost effective with the subsidized, and not real cost that nuclear reactors are currently getting, because nuclear reactors aren't cost competitive either, that is why they are so heavily subsidized. So that ought to be addressed.

FACILITATOR CAMERON: Okay, thank you for those specific comments, Mike. We are over our time and since Judy Johnsred graciously gave up her spot earlier, I promised that she would have at least a couple of minutes.

And Judy could you -- well, do you want them? If you would please just try to keep it brief for us? Dr. Judy Johnsred.

PBD05 DR. JOHNSRED: Thank you, Chip. My name is Judy Johnsred, I did my doctoral work in the field of the geography of nuclear energy, and I have a sort of a unique position here today.

I represent the Environmental Coalition on Nuclear Power, founded in 1970, here in Pennsylvania. And Sierra Club, technical advisor to their national waste committee, currently.

But I was -- we were original intervenors in the licensing of units 2 and 3 of Peach Bottom. And so it's been a long 30 years for me, to have to come back here now and find that the agency personnel either haven't learned, haven't come to understand the nature of radiation injury, or they are not allowed to do their job.

There are three sets of people here that I really wanted to be able to address. Those of you who live here, and those who have come because they don't live here, but they care about here; the NRC Staff, and those who, I assume, are the majority here of Exelon company. And I think that what so many of us, including those associated with the industry, perhaps haven't really grasped is what is driving the force to relicense an aging plant with a less than sterling record.

05-4 When, indeed, there are available other much cleaner, much cheaper, much more durable sources to generate the electricity, the energy that we need. We are beginning to hear, in Pennsylvania, about distributive energy, taken seriously, where in a community is concerned to supply for itself.

But what is driving this, why do you folks in the agency, who very frankly ought to know better, if you are reading the literature in your own field, if you were attending conferences that the NRC has not seen fit to bother to attend, concerning the impacts of low level radiation.

What is driving it? It is the law. How many of you have heard me read the law to you? Read the law. How many of you have read the National Nuclear Energy Policy Statement? Anybody in the room? Right, and you heard what they had to say.

You who work for the Agency? It is chapter 1, section 1, and you better listen, it is why we have the problem facing us, of 50 percent more high level radioactive waste, and far more radioactive waste and materials that will be deregulated, that are already being deregulated, to be recycled into the consumer products of all of us.

The law says, Atomic Energy is capable of application for peaceful as well as military purposes. It is, therefore, declared to be the policy of the United States that the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, which is not defined in the law.

Subject at all times to the paramount objective of making the maximum contribution to the common defense and security, and the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, improve the standard of living, and strengthen free competition in private enterprise.

05-5 Now, there are two things not mentioned here. Did you catch them? There is not a word about protection of the public health and safety, or of the quality of the environment.

You have to read down several sections and, even then, those factors which are surely the paramount objective in our society, are subordinated by being equated with national security and the free enterprise factor.

05-6 I am appalled at the unwillingness of the Nuclear Regulatory Commission, and EPA, and DOE, to consider the information that is now becoming available concerning the impacts of ionizing radiation on the well being of living creatures, organisms of all kinds.

05-7 You fellows up here are well beyond being that healthy, young, standard man. So you ought to listen carefully. Because those standards that were mentioned to us by Dr. -- those standards were, in fact, developed based upon standard man, using weighting factors for organs, divorced from the reality of the variabilities in human susceptibilities to disease, to exposures, to the synergies between and among the sources of contamination that are with us, throughout our environment.

And the comments that you have heard today that are very significant, concerning health impacts, are based upon essentially an epidemiological approach, and that is really all we've had in the past, on which to base our understanding of health impacts.

05-8 But whenever a community has requested a health study, and the health study has shown that, indeed, there are excesses of certain cancers, or leukemia, the response has been, but that is too small a sample to have statistical significance.

And I think we are at the point where we need to think about how many such insignificant studies add up to very substantial significance to be taken seriously.

05-9 But the situation with regard to the health impact of the uses of ionizing radiation that increase within our society, within our environment, those today are being looked at in a very different way.

And that way is through molecular and cellular radiation biology, that is really beginning to get us an understanding of the mechanisms of the damage.

And I don't see that that is being factored into this study, anymore than the totalities, the systemic approaches that are necessary in order to have a valid environmental impact statement.

Having promised you that I was going to make it very short, I'm not going to say many of the things that I think also need to be said. But I commend to you the comments, reasoned, careful, thoughtful, and correct comments that you have heard today, from many people who care about the well being of this area of southern Pennsylvania.

05-10 I urge, really a total reworking of this EIS, of the
05-11 environmental review necessary. And I would strongly, strongly urge the NRC to set a precedent of denying a license extension.

FACILITATOR CAMERON: Thank you, Judy, and thank all of you for coming out and sharing your concerns, and your comments with us. We are going to be back at 7 o'clock for another meeting, open house at 6 before that.
Thank you, and we are adjourned.

(Whereupon, at 5:00 p.m. the above-entitled matter was concluded.)

Transcript of the Evening Public Meeting on July 30, 2002, in Delta, Pennsylvania

[Introduction, Mr. Cameron]
[Presentation by Mr. Tappert]
[Presentation by Mr. Anand]
[Presentation by Mr. Wheeler]
[Presentation by Mr. McDowell]
[Presentation by Mr. Palla]

FACILITATOR CAMERON: And the NRC staff, our expert consultants, will be here after the meeting. So take the opportunity to talk with them if you care to about various issues.
We are now going to go to formal comment from all of you, and we have some people signed up who wanted to make comments tonight.

And first I would like to ask Mr. Norm Wurzbach to come up. Norm? Come up here if that is comfortable for you, or you can go right here. Thank you.

PBD15 MR. WURZBACH: Norm Wurzbach, I live about ten miles north of here, I run a beef farm operation. I appreciate having electric power into my farm, it supplies me with water, at night lights. I think it is a great benefit.

15-1 I feel that Peach Bottom probably produces the electricity I use. I have no problem with it, and I think it should be extended for another 20 years, because it is an attribute to the whole neighborhood, because a lot of people in the area do work at Peach Bottom, also.

15-2 As long as it keeps our electric rates down I think it is a good move, because it doesn't use fuel oil, it doesn't use gas. I use these items myself, and I also use coal, which it doesn't use.

15-3 So I'm not competing. So it keeps things cheaper, and we are importing too much oil right now, and that would be one of the alternatives, I think, and that is not good. Thank you.

FACILITATOR CAMERON: Thank you very much, Mr. Wurzbach. Next we are going to go to Nicki Roth. Is Nicki still here?

We will go back to Nicki if he or she comes in. Let's go to Alan Nelson, Nuclear Energy Institute. Alan? He is out there too. Okay. Sandy Smith?

MS. SMITH: Did you call me before?
FACILITATOR CAMERON: No, I didn't. And, Sandy, take your time to -- whatever you need to say.

MS. SMITH: Good evening. Even the grim reaper needs glasses. I just realized, earlier today, when I was standing here as the grim reaper, my daughter made this outfit for me really, quick, in about a half an hour.

But I was pregnant with her in '79 almost had the meltdown, minus 30 minutes. So perhaps this is a very apropos outfit to be wearing to get the message across.

Thank you for letting me speak. Although I'm very angered that this old nuclear plant is even being up for license renewal, the NRC's own standards stated Peach Bottom was supposed to be closed 20 plus years ago.

What has changed? Has anyone from the NRC personally inspected every piece of rusty metal, worn parts, fractured cement. This is no way that Peach Bottom can operate safely or economically, and should be shut down, according to the Nuclear Regulatory Commission's own figures.

When death, health, and environmental desolation are added up, Peach Bottom definitely is not cheap. Who is going to pay in York County, or in the surrounding areas if, perhaps, this corporation goes into bankruptcy down the road?

Who has a bond, what kind of insurance do we have with the spent fuel, with everything else? We don't. According to the Federal Register notice, each relicensing is expected to be responsible for the release of 14,800 person Rem of radiation during the 20 year life extension.

This figure includes releases from the nuclear fuel radiation release, spread over the population, and will cause 12 cancer deaths per unit. That would be 24 for Peach Bottom, they have two units.

There was a person who spoke this afternoon that said, is this really worthwhile, if we know for pretty much a fact, that at least 24 people will die in the next 20 years, because of this radiation?

If someone came in right now and shot 24 people, would that be all right, would anyone here like to volunteer for it? I don't think I know of anybody in York County that would like to volunteer for that sort of thing.

This figure does not include accidents that can happen along the way, other casualties. This is only calculated. There are not 12 people, there are not 24 people.

TMI is also close by. The NRC has said it expects as many as 100 reactors to apply for relicensing extensions. This would result, and I had figured it wrong, over 2,000 cancer deaths among the United States population.
Pennsylvania has the second highest number of nuclear reactors, with the second highest nuclear waste. And because of that our government is telling us we should have a nuclear dump. They are right, we made it, we might as well keep it here.

But we shouldn't have to have a nuclear dump. We don't need to be producing more, it can't all go to Yucca Mountain. Even if we are for Yucca Mountain it can't go there, because we would still be making too much if we keep relicensing these nuclear facilities.

Nuclear power is not an admission free technology. The entire nuclear fuel chain, the uranium, primary mines on the lands remaining to indigenous people, uranium conversion, enrichment, fuel fabrication, each step exposes workers and communities to radioactivity, and each step generates radioactive waste.

Radio curies defy the concept of disposal, they don't go away, we just move them around. There is no such thing as a nuclear dump that won't eventually leak.

The NRC acknowledges that the allowable limit, 100 milli rems a year for radiation exposure via air, from any nuclear reactor, to the general public, will cause a fatal cancer in 1 out of 286 people.

This is very high when compared to the standard of 1 in one million considered an acceptable level for human sacrifice for another industrial activity.

The 1986 catastrophe of Chernobyl has seriously affected the health and welfare of the belrussian people. I know, I was there. I saw it. I don't want to hear that our nuclear facilities are built different, it won't happen.

It almost did happen at TMI, I was there when it almost happened at TMI, too, that morning. But in Byelorussia it happened, I have seen the children, I have seen the children go back and forth to be detoxed in Kiev, and in Israel, and the parents not getting to see their children for maybe as long as six months.

Then they come back home again and it is all over again, radiation. The only thing good is that it sure grows mushrooms big. But that is it. The land, the everything is very desolate, very sad.

The average life expectancy of women has declined by five years, over there. Only ten percent of the children are completely healthy. Cancer among adults and children have increased in Ukraine and Moldovia, as well.

Two-thirds of the Ukraine is contaminated and 70 percent of the food. The watershed of the Kiev basin has been so contaminated that it would take 200 billion dollars to just purify the water, which they don't have. Forty million people have to drink it, and they do.
TMI was 30 minutes from a meltdown. How much disaster insurance does Peach Bottom carry for York County? We have a right to know. They don't carry it.

Our tax dollars are paying for some peripheral. Who is going to pay for the Susquehanna if it is polluted like that? Where is this money coming from? I will tell you what is going to happen, they are going to go into bankruptcy, just like all the other corporations, because they can't do it, and we will be stuck possibly with useless land that absolutely no one wants.

And then where do we go, where do we live? The NRC has offered to pay the cost of two day's supply of potassium iodine pills for people living within ten miles of a nuclear power plant.

Thyroid cancer is a major result of reactor accidents. The exposure can continue for days, even after one leaves the area, it is in your blood, it continues.

If a nuclear accident occurred during a natural disaster, earthquakes, hurricanes, blizzards, ice storms, or an attack, evacuation would be difficult, time consuming, and maybe impossible.

And people would need at least 10 days to 30 days supply. Even the EPA manual states that these pills should be given within 3 to 4 hours after the accident, if it is going to do a tremendous amount of good.

So that means that even if you have them at home, if your children are at school, or at day care center, those centers have to have them too. They need to be stockpiled there, they need to be stockpiled at work.

Soaring rates of thyroid cancer are still appearing in the children over in the former Soviet Union countries, who were exposed to Chernobyl, because they received too little, too late, of iodine.

There is no way that this seemingly simple protection could be carried out, even here, in York County or surrounding area. Why do all of our tax dollars have to go to pay for Peach Bottom, a private company's hazardous operation?

In the past three years old and worn out equipment have caused dozens of incidents requiring plants to shut down. On May and August 2000, Peach Bottom unit 3 was forced into an emergency shutdown when an instrument valve failed and caused a leak of contaminated coolant.

The coolants are worse probably than the reactors, as far as the radiation. The NRC has just estimated that with a spill, within 50 miles, people will be affected. We know people will be affected.

Ten miles is a joke, this is affecting everybody, we must find another way. We must asses the nuclear age itself, in the wake of Chernobyl. There are more than 450 reactors in operation on the planet today.

Each generates radioactive waste that will be a threat to human life for hundreds of thousands of years. Each routinely releases radioactivity into the air and water.
Poland was the only country that protected their children with iodine tablets when Chernobyl erupted, and that is not a polish joke. As far right now, today, as Scotland they are still feeling the effects of Chernobyl with their sheep, they may not be able to be sold, and a lot of their land.

This is serious, it is lasting, it is not something that we can just put a band-aid on. There is no safe place. We saw the forest fires from Canada, that is exactly the way the radiation goes, by the air.

If nukes are so safe why do we have our phonebooks with evacuation routes? Why is the industry trying to figure out where to dump this deadly waste? And why is 46,000 dollars of our hard earned money in York County, being allotted every year for the radiation emergency response?

That is why it is so cheap, the nuclear plants don't have to pay for anything, hardly. We are paying for them. They are buying these cheap worn out plants that are ready to die, anyway. They are going to make as much money as they can on them, and go.

And that is exactly what is happening, and we are footing the bill for everything. The NRC, that is us. Those are our tax dollars, we are paying them, they are paying for the tablets that very few people will get.

If most people want them, and their protection, we are going to have to pay for them. We are paying for all these things, and we shouldn't be. The NRC does not close down, if they don't close down Peach Bottom we don't have to worry about the terrorism, because our government is terrorizing us enough by keeping these open.

And I hope you all check out the calendar that is out there. In case of an emergency at Peach Bottom, and they've got cute little pictures by children that have drawn them, and things to do, going into their basement, and everything.

These are little kids' pictures, and that is what that calendar is telling them about. We've got to grow up, we shouldn't have anything that is going to cause an emergency, that is going to cause an accident on this magnitude.

There are plenty of other ways we can make money, we don't need to make money this way. We all have a responsibility, if not to ourselves, to our children. And we don't need to do this to earn money for their education.

What good will their education be if they don't have a place to use it? Thank you, good night.

FACILITATOR CAMERON: Thank you, Sandy. We did hear, this afternoon, and this evening, from Sandy. But a statement that was in the draft environmental impact statement about 12 deaths. And we thought it was important enough to try to at least explain what the -- what that was supposed to mean.

And Patricia Milligan, who is a health physicist with the NRC is going to try to give us an explanation on that.

MS. MILLIGAN: Good evening, I'm Trish Milligan, I'm a certified health physicist, I work for the NRC. I'm also a pharmacist, I've spent a lot of years in the practice of pharmacy, and also nuclear pharmacy, so I have a wide spectrum background, and I've spent a number of years working for a nuclear power stations.

The 12 deaths that you are talking about, those aren't real deaths. It is not like we walk in and say, one, two, three, four, five, too bad for you guys.

What we do is we calculate, statistically we calculate, based on a lot of assumptions, and a lot of models, what would happen if this person, or this large population received X amount of dose for a period of time.

Now, there are several theories that are in considerable debate in the scientific community. And the theory that we use, and the model that we use to come up with these statistically calculated deaths, if you will, is something that is known as linear no threshold.

We assume that any dose, no matter how small, has some impact. And we assume that it is more or less a straight line, higher dose, higher impact. And that is the model that we use.

If you look at other work that is out there, in fact there was a statement put out by the Health Physics Society, which is a large collection of scientists in the field of radiation protection and physics, and only a very small percentage of those are involved in reactor health physics.

They believe, based on evidence that is in the world today that there is, in fact, a threshold. And they would suggest, from their position statement, that any dose below 10 rem is considered inconsequential, because there is no body of evidence, hard evidence, to suggest that anything less than 10 rem is deleterious to health.

At the NRC we have adopted the most conservative model, which is any dose would have some impact. Based on that, and based on the assumptions of human behavior, and this infinitely large population, we calculated if you believe A, B, C, D, E, then over a population, over a lifetime, you may expect to see 12 additional cancers in this area.
Now, if you look at the, what I guess I would call the background cancer rate in this country, there is approximately 1.3 to 1.5 million new cancers that are diagnosed each year.

So what we would be talking about would be a statistical number 12, or 2000 over 20 years, so that would be -- yes, so that would be, essentially, 100 additional cancers if you will, over an infinitely large population surrounding all the power plants.

Now, people always get uncomfortable when we are talking about statistically calculated deaths. Because, after all, we are more than statistics. And I understand that.

Having had cancer myself, and having lost a younger brother to cancer, I understand very much what statistics are all about, and none of us like to feel like we are statistically insignificant.

But when we look at these kind of models we make some very broad, very conservative, very protective assumptions. So that when we say 12 additional deaths, or 2000 additional deaths over 20 years, those aren't real people, it is not like 12 people put up your hands and you are out of here.

These are just statistical models that are done, much like what the EPA does when they do the risk analysis, where they decide there is an acceptable risk of 1 in 10,000 cancers. It doesn't mean that 1 in 10,000 of us is going to get a cancer from this particular toxin.
It is just meaning based on these models, and these assumptions, this is the conclusion that we have come to, in order to affect a very wide margin of safety for the public.

So it is not like there is 12, or 2000 people equals 20 years are going to fall over, and that is from reactor emissions. That is just part of the modeling that we use, and it is a very, very conservative model, for which is under tremendous debate in the scientific community at this point.

Do you have any questions?

FACILITATOR CAMERON: Yes, I think there might be. Do you want to ask a question, Sandy?

PBD03
03-19

MS. SMITH: Well, on the risk assessment, I don't think any -- the risk is always, it is a risk. And we shouldn't be, I don't think you would have a risk with how many people are going to die from windmills.

So maybe we ought to work on some other energy things, here. We had Dr. Manago was here, and I'm not going to go on with his credentials, maybe some of you are familiar, maybe not.

But he is very well known in the field. He doesn't work for the NRC, or he doesn't own a nuclear facility, so he has nothing to gain, one way or the other. And he has done a lot of independent studies.

One of them is the famous tooth fairy study, where what he has done is that the body doesn't know the difference between strontium 90 and calcium. So strontium 90 being radiation. So the body will take in whatever is available.

If there is a lot of radiation in the area, and I'm making this simple, the body will take in more radiation than calcium. If you are in an area, maybe if you took more calcium, you would be all right.

At any rate is the idea is, the government has done these studies in the past, and the idea is, they are taking teeth from children that were born after 1970, across the United States, checking the teeth for strontium 90, and trying to see if there is hot spots, if there is any kind of correlation, or whatever.

03-20

And very interesting that here in Lancaster, York, and Chester County it is very high, it is 26 percent higher with the children. And he had some very good studies, and statistics, which he handed in before.

So it basically depends who you hear from. And I always like to hear from someone who has nothing to gain, politically, or money, or anything, rather than the fox watching the henhouse. Thank you.

FACILITATOR CAMERON: If anybody wants to see the full text of Joe Mangano's presentation today, it will be on the transcript that will be available. Thank you, Sandy, and thanks Trish, for trying to clarify that, clarifying that for us.

Mr. Guyll, are you ready? And I think this microphone is fixed now, isn't it? This is Mr. Ernest Guyll.

PBD16

MR. GUYLL: I prepared some written comments, I will just read from them, so I won't go too long.

I received the draft report for comment of the generic environmental impact statement for the license renewal of nuclear powers, regarding Peach Bottom atomic power station Units 2 and 3.

And this is not really a reader friendly document, and I had some trouble locating points of interest. I was here on November 7th, and made some comments there.

16-1 There was no mention of my question regarding an evacuation plan for the Amish in the event of a nuclear accident. And I made this question in the past at other NRC meetings. I've never seen any evacuation plan for the Amish.

16-2 I found no mention of my request that past performance of the plant be taken into account, including control room operators sleeping on the job. Perhaps that is not a new issue.

16-3 There was no mention of my concern of the danger of spent radioactive fuel being stored on site.

16-4 There was no mention of my comments about the problems with the emergency warning sirens.

16-5 In an NRC document dated August 15th, 2001, it is noted, and I'm quoting here from the NRC document: "Two former contract technicians deliberately falsified siren testing maintenance records, and performed inadequate siren tests while professing that all activities on siren records were properly done.

And, two, one of these technicians knowingly installed jumper wires to bypass failure detection circuitry on at least 10 siren boxes, which would demonstrate that the sirens were working properly, even if they were not."

And that might be an old issue, too, that might not be a new issue.

16-6 It is my opinion that the NRC had already decided to renew the license of the Peach Bottom power plant when they received the application. The only reason meetings are held is to meet a requirement.

Sam Gejdenson, the former Chairman of the House Interior Subcommittee on Oversight said about the NRC: On a number of occasions the -- I'm sorry, I'm quoting here.

"On a number of occasions the Commission has acted as if it were the advocate for, and not the regulator of the nuclear industry."

16-7 I continue to be concerned about an earthquake, given the proximity of the martic fault line. And, by the way, that is spelled M-A-R-T-I-C, not M-A-R-T-I-C-K, as erroneously recorded in the report.

16-8 According to a Lancaster New Era article, on July 1st, 1994, corrosive cracks found inside a Peach Bottom reactor "could cause a meltdown during an accident or earthquake, the Nuclear Regulatory Commission said today. Cracks in the York County nuclear reactor are expected to grow, and will have to be monitored, the NRC said.

NRC officials also warned that the cracks could lead to a meltdown if they shift during an accident, or a natural disaster."

And I could find no mention of this in the draft report for comment. And that also might not be a new issue, that was seven years ago.

16-9 I would still like to know how many accidental releases of radiation have occurred at Peach Bottom since it began operations. I would like to know the type of radiation, the amount of each release. The draft report does not address this in detail.

16-10 I would like to have data on cancer cases, birth defects, and stillbirths in a ten mile radius of the plant, and compare this information to the national average.

16-11 The draft report does not address this in detail. I would like to know the type of radioactive isotopes at the plant, and the half life of these isotopes. Are strontium 90 and strontium 89 the only radioactive isotopes at the plant? Because I think those are the only two mentioned in the report.

16-12 The draft report notes the socioeconomic problems associated with the shutdown and decommissioning of Peach Bottom. However, if a power plant were to operate around the same area, using renewable resources, such a plant would need a large number of employees who would probably be just as involved in the community as the current Peach Bottom employees.

And I do not agree with the conclusion of the draft report which notes that the impact of renewing the license at Peach Bottom would have a small impact on land use, ecology, water use, and quality, air quality and waste.

I do not agree the use of renewable resources at the same site have a greater impact on the environment than the current plan.

16-13 Since the Peach Bottom plant is located on the edge of the great east coast megalopolis, an accident could have a devastating effect on millions of people.

We need to shut down and decommission the Peach Bottom atomic power plant before a horrible accident occurs.

FACILITATOR CAMERON: Thank you very much, Mr. Guyll. Duke, did you have something to add?

MR. WHEELER: Excuse me, Ernie, you are in our mailing list for correspondence related to our environmental review, and I'm wondering, do you recall receiving a copy of our environmental scoping summary report, back in April? I have a copy of it here that I will share with you.

I will let you see what it is. And if you did not receive a copy, when I get back to the office I will put a copy in the mail to you, and it does identify, it addresses various things that you brought up here, at least the great majority of them.

I don't have them all in my head. But, for example, your interest in the provisions for evacuation of the Amish, and where that fits into our license renewal. That is in our scoping summary report.

If you will see me after the meeting, I've got my copy of it, and I will make sure that you get a copy.

FACILITATOR CAMERON: That is correct, and I think that what Duke is saying is that we did try to be responsive to your comments. And, Duke, if you could talk to Mr. Guyll offline?

MR. WHEELER: And also the librarians are on my list. I will call the libraries and see if they got this particular document. I may need to mail it out again.

FACILITATOR CAMERON: Thanks, Mr. Guyll, and thanks Duke. We are next going to go to Mr. Alan Brinson, from the Emergency Management Agency of the Commonwealth of Pennsylvania.

MR. BRINSON: Good evening, everyone. My name is Alan Brinson, thank you. I appreciate and thank you all for coming out here.

This type of meeting is doing exactly what it is supposed to do; provide information, give you opportunities to discuss things, to learn some things, and perhaps to provide some clarification.

Today I heard a number of things mentioned that I would like to expound upon, a little bit. First of all I'm the lead emergency off-site planner for this state, for Peach Bottom atomic power plant.

And while I profess to be no expert, I have immersed myself in the emergency preparedness of this community, and am quite familiar with a number of facets associated with that.

The comments regarding the Amish community, it is very important. There are a number of provisions that have been set forth for the Amish community. This is not a new issue, it is something that comes up on a fairly routine basis, and particularly an important one at this time.

So that we can clarify exactly what is being done with the Amish community, let me go ahead and speak on it.

The easiest way to do this is to start off with the siren system, and the EAS. It was particularly troubling to us, the State of Pennsylvania, as well as the NRC, when Peach Bottom and the siren system indicated the problems that the gentleman just spoke about.

The utility, to their merit, actually self-reported that event. So it was the utility who took the first response, and many subsequent reports, to satisfy the Commonwealth, and the NRC, that the siren problem was addressed, and that any future problems with the siren would become certainly not the issue that was presented when falsification took place.
But the utility did the right thing in reporting, and I think you will find that in the supplemental reports that were filed with the NRC.

Now, the siren system is the primary method for communicating with the public. Following that, an emergency alert system, turning to radios, and television. But there are also other methods for communicating across the Commonwealth.

If the sirens fail we immediately go into a route alerting. Much of this is done at the county level, and plans are in place for each county to respond to a siren failure and provide route alerting teams.

Now, against popular myth, the Amish do have radios. The Amish, from what I gather, are certainly tapped into the national oceanographic, or NOA, through the national weather service radios. They certainly have the ability to get information, and we have the ability to put information through the National Weather Service, so that they have emergency information relative to Peach Bottom, through that delivery system.

As I said before, the counties have the predominant responsibility for including provisions in their plans for the treatment of not only the Amish, but all publics in the community area.
Lancaster and York specifically address, in their plans, a set of procedures on how to address the Amish population. Chester county, they have one municipality in this EPZ, emergency planning zone, that is West Nottingham township.

And, frankly, they have four families. Those families are part of the police of West Nottingham, to be notified by the police in West Nottingham Township.

Much has to be said about the Amish way of communicating. The plans that the counties have are to notify the bishops. The bishops then have various methods to contact members of their community.

And for many of us who are not familiar with the Amish, it seems to be something of a mystery. But for those of us who live in and amongst the Amish community, as I do, they have quite an efficient, and effective way for getting information out to each other, I can assure you of that.

Now, they also have the same access to what is called a special needs survey that is conducted annually. The special needs surveys are sent out in mailings to every household in the EPZ.

Those people who have special conditions, whether they need notification, whether they are hearing impaired, or whether they are unable to walk, or be transported, they go into a special needs form that is then placed with the county.

So there is a data base in the county for people with special needs. Now, there has been an enhancement to that, because this Amish question is so important to us. The counties have now requested that their annual survey for special needs include a questionnaire.
And you will be seeing this in the York area, I believe, in the near future. This survey question is going to be asking the question, do you have access to a phone or a radio?
If the respondents to that survey indicate no, they will be placed in the special needs group. And as such the county, or the municipality, whatever jurisdiction is responsible, for communicating with those people, will then be -- they will be putting messages out to them through this special needs program.

So there are many methods to communicating with the Amish. Any questions? Thank you very much.

FACILITATOR CAMERON: Thank you, Al, for providing that information from the state for us, thank you.

I would like to ask Dr. Shirley Liebman to come up and talk to us. Dr. Liebman?

PBD17

DR. LIEBMAN: I'm going to read my comments. I usually don't read in some of these presentations, but I will at this time.

Our family has resided in Lancaster County since the '60s, and for the past 20 years or so, right in Holtwood, just ten miles or so north of here.

My attendance at the first public scoping meeting last fall, for the license renewal, gave me a first-hand knowledge of the process that was discussed in detail, in numerous handouts, with much relevant data.

Unfortunately the negative comments by the anti-nuclear activists were amplified by the media, rather than the overall supportive input by our local residents, such as myself, and most other interested attendees.

Basically we feel that our national energy needs have been outlined, over these past decades. And the vital role that nuclear energy plays now, and should play in the future, is clear to us.

17-1 The Peach Bottom facility has had an outstanding performance record, overall. The draft report, that we've just heard about, and we are here to discuss, prepared for this renewal of the specific nuclear plant, addressed all required regulatory issues in a clear and comprehensive manner.

Many questions posed by the interested citizens, at the meeting that I was at, were addressed, and gave essentially a basic conclusion.

There has been, and will be, minimal negative environmental impact. You all have used the word small as your category of comment. Indeed, it is acknowledged by all reasonable persons that no human actions are totally risk-free.

Not in our homes, not in our community, and certainly not throughout the environment. The risk assessment studies that we've just heard explained by the gentleman, helped to put the environmental issues into perspective, as conducted by the NRC and other capable people.

17-2 I believe that the stated plans given in the draft provide for the highest level of safety and efficiency that is reasonable, that reflect the concerns, and the expertise of those directly responsible for the management and operations of the Peach Bottom plant.

17-3 Indeed, it is imperative that we are supposed to be continuing in all our nuclear plant facilities, and the waste transportation actions, to improve in this new era of our homeland security concerns.

So in summary the projected license renewal of the Peach Bottom nuclear plant is a vital path in meeting our nation's immediate and future energy needs.

17-4 So as local residents, and concerned citizens, our family strongly supports the proposed NRC actions. And just to throw a comment in, since some of these other persons have raised some questions as to some technical capabilities, and what have you, that they felt were in question.
I'm retired from industrial research and development with about 40 years working in the materials and environmental sciences. And my colleagues in the industrial research community, the universities, and with the EPA researchers, have made it quite a direct connection to this area of environmental concerns.

My work with the EPA people, as an industrial researcher, was in the '70s and '80s. And together, all of us in industry and government, really worked to put together the so-called master analytical scheme, our areas in analytical research and services, and in the environmental sciences, for the methods and instrumentation that are now fundamental throughout the country, and the world, in environmental trace analysis.

So the results of my research, specifically if any of you wish to find out which kind of detectors are used, and you are concerned that the ability of the NRC to monitor properly the air, water, and solids materials, my colleagues and I have documented our work in over 200 publications, and presentations in about two or three dozen technical journals, many articles, book chapters, and books, and so forth.

So there is lot of documented information that you can follow, for those who feel it necessary. Thank you.

FACILITATOR CAMERON: Thank you very much, Dr. Liebman.

Is Nicki Roth here? Okay, that is all the speakers we had for tonight. And is there anybody that I missed?
(No response.)

FACILITATOR CAMERON: Well, the NRC staff, our experts, archaeologists, and other disciplines are here. Please feel free to talk to them after the meeting.
We are going to adjourn now, and thank you all for coming out and sharing your comments with us. Goodnight.

(Whereupon, at 9:00 p.m. the above-entitled matter was concluded.)

To: Duke Wheeler, NRC
Peach Bottom EIS@nrc.gov
From: Shirley Liebman, Ph.D.
Local Resident, Concerned Citizen of Lancaster Co.
Consultant Member, The CECON Group, Inc. , Wilmington,DE
Science & Engineering Consultant Network
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Date: July 13, 2002

Subject: Registration for Oral Comments at July 31st Public Mtg.
Peach Bottom Inn, Delta

I received the July 8, 2002 Memo concerning the public meeting on July 31st to comment on the Draft Environmental Impact Statement for the license renewal process at Peach Bottom.

I would like to present a summary of the comments (sent via Email July 5th) that resulted from my evaluation of the Draft document. However, since I had attended last year's afternoon public scoping meeting in Delta, I recall that the majority of favorable comments (and applause from many attendees) had minor press coverage, while the evening 7 PM meeting had TV/press focused on the comments from non-local anti-nuclear activists. Hence, their negative, confrontational statements were amplified by the media.

For that reason, I defer to your scheduling of my comments to the session(s) most helpful to acknowledge and support the Draft document content and conclusions. Furthermore, I suggest updated commentary be made from NRC persons to address highlighted security measures, both for on-site facilities and for nuclear waste transport off-site. It should be made clear that we all share responsibility as active citizens in Homeland Defense efforts to support continuing safe, efficient operation of our nation's nuclear power plants.

Please advise me as to your response to my registration for comments. I will furnish a written summary prior to that time, should you request it.

Thank you for your time and attention.

To: Chief
Rules & Directives Branch
Mailstop T-6D 59
U.S. Nuclear Regulartory Commission
Washington, DC 20555-0001
Email: Peach_Bottom_EIS@nrc.gov

From: Shirley A. Liebman, Ph.D.
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Date: July 5, 2002
Subject: Response to Draft of Plant-Specific....Peach Bottom License Renewal

The following are comments made as requested in your correspondence of June 24, 2002, which included the Draft Plant-Specific Supplement 10 to the Generic Environmental Impact Statement Regarding Peach Bottom Atomic Power Station, Units 2 and 3 (TAC Nos. MB2011 and MB2012).

I have read the above document and find the information content and its presentation to be clear and comprehensive, in response to the public needs regarding the license renewal process. All major regulatory requirements are noted and explained, in addition to specific responses to questions put forth during and after the general scoping meeting in November, 2001 in Delta, PA.

Detailed coverage was given of all major environmental topics, including demographics, background operational data, and reasonable future activities. Current data that addressed specific health and operational concerns were presented, as requested by local residents and concerned citizens. Using risk management procedures, it was shown that any / all plant activities have minimal or small levels of risk to the environment or to human health. Continued surveilance will ensure prompt actions wherever needed, since it is accepted fact....*all human activities carry a non-zero risk level.*

Expertise from several sources was included: Peach Bottom Plant employees, officials / consultants from state, regional, and local areas, as well as experts from our National Laboratories (LLNL, Argonne, and Los Alamos). Projections were made in specific areas as to any changes that would take place upon renewal of the 20-yr. license: no new adverse operational effects are anticipated. Responses are planned to the likely increases in nearby populations (York / Lancaster regions) and to heightened emergency management actions that are now basic to all U.S. nuclear reactor facilities.

In summary, the draft document is a fully informative, clear outline of the intended license renewal of Units 2 & 3 at Peach Bottom. All regulatory and citizens' requirements for safe, efficient operation are presented to meet or exceed the needed levels. It is excellent an public documentation in support of a successful renewal process.

Signed:

Shirley A. Liebman, Ph.D.
Local Resident, Concerned Citizen, Lancaster County

Consultant Member, The CECON Group, Inc., Wilmington, DE
Science & Engineering Consultant Network

Member, Board of U.S. Army Science & Technology (BAST)
National Research Council, National Academies
Washington, DC

P.S. I would be willing to present a summary of these comments at the upcoming public scoping meeting in Delta, July 31, 2002, if requested.

X-Mailer: Novell GroupWise 5.5.4
Date: Mon, 07 Oct 2002 12:46:55 -0400
From: "Peach_Bottom_EIS Peach_Bottom_EIS" <Peach_Bottom_EIS@nrc.gov>
To: <mcdowell5@llnl.gov>
Subject: Fwd: Supporting info.

Return-path: <Odiejoe@aol.com>
From: Odiejoe@aol.com
Full-name: Odiejoe
Message-ID: <a.22d75f92.2a7b119f@aol.com>
Date: Thu, 1 Aug 2002 18:35:11 EDT
Subject: Supporting info.
To: prm@nrc.gov
X-Mailer: AOL 4.0 for Windows 95 sub 120
Mime-Version: 1.0
Content-Type: multipart/mixed; boundary="=_D68A4798.6D0C548A"

Dear Pat (or please tell me what I should call you):

Sandy Smith gave me your email, so I'm sending you the hard data I used, with sources, in my presentation yesterday. It's attached as a word file.

If you have any questions, please feel free to call me at 718-857-9825.

Best wishes, Joe Mangano


PEACHB~42.DOC

STATISTICAL DATA USED IN
ASSESSING HEALTH RISKS
FROM THE PEACH BOTTOM NUCLEAR PLANT

1. Cancer Death Rates, Age 0-9, 1987-99, Local Counties

Area	Deaths 0-9	Population 0-9	Deaths/100,000	% +/- U.S.
Chester Co.	28	727,529	3.85	+12.2%
Lancaster Co.	45	859,737	5.23	+52.6%
York Co.	22	627,052	3.51	+ 2.3%
3 PA Counties	95	2,214,318	4.29	+24.7%
Baltimore Co.	51	1,180,863	4.32	+25.9%
Cecil Co.	2	151,282	1.32	- 61.5%
Harford Co.	23	402,673	5.71	+66.5%
3 MD Counties	76	1,734,818	4.38	+27.3%
6 Cos. < 40 Mi.	**171**	**3,949,136**	**4.33**	**+26.2%** p<.04
U.S.	16,960	492,387,655	3.44	
Other PA/MD	887	25,858,026	3.43	

Source: U.S. Centers for Disease Control and Prevention (www.cdc.gov, data and statistics, CDC Wonder), accessed July 16, 2002. Includes ICD-9 codes 140.0-239.9 (1987-98), and ICD-10 codes C00-D48.9 (1999).

2. Cancer Death Rate Trends, Age 0-9, Lancaster and York Counties

1950-74 (Before Plant Startup)

Type of Cancer	Deaths	% +/- U.S.	Expected*
Leukemia	111	+ 5%	105.7
Other Cancers	88	- 19%	108.6
Total	199	- 7%	214.3

1975-84 (After Plant Startup)

Type of Cancer	Deaths	% +/- U.S.	Expected*
Leukemia	21	+11%	18.9
Other Cancers	28	+ 4%	26.9
Total	49	+ 7%	45.8

* Deaths/% +/- U.S.

1987-99 (Most Recent)

County	Deaths	Population	Rate/100,000	%+/- U.S.
Lancaster Co.	45	859,737	5.23	+53%
York Co.	22	627,052	3.51	+ 2%
Total	67	1,486,789	4.51	+31%

Summary:
1950-74 7% below U.S.
1975-84 7% above U.S.
1987-99 31% above U.S.

Sources: Jablon S., et al. Cancer in Populations Living Near Nuclear Facilities, Volume 2, Table 1-C.22 National Cancer Institute. NIH Pub. No. 90-874. Washington DC: U.S. Government Printing Office, 1990. (covers all data up to 1984)

U.S. Centers for Disease Control and Prevention (www.cdc.gov, data and statistics, CDC Wonder), accessed July 16, 2002. Includes ICD-9 codes 140.0-239.9 (1987-98), and ICD-10 codes C00-D48.9 (1999). (covers 1987-99 data)

3. Cancer Death Rate Trends, Age 60 and Over, Lancaster and York Counties
Includes Cancers Most Sensitive to Radiation Exposure

Type of Cancer	% +/- U.S. 1950-74 (deaths)	% +/- U.S. 1975-84 (deaths)	% Change
All Cancers+	- 3% (13755)	+ 4% (9342)	**+ 7% ***
Leukemia	- 7% (514)	+ 0% (344)	**+ 7%**
Hodgkin's Disease	- 12% (77)	+ 4% (30)	**+16%**
Other Lymphoma	+10% (387)	+ 8% (307)	**- 2%**
Multiple Myeloma	- 10% (152)	+21% (186)	**+31% ***
Female Breast	+ 9% (1203)	+17% (813)	**+ 8%**
Thyroid	- 11% (52)	+35% (33)	**+46%**
Bone and Joint	+ 5% (82)	+13% (24)	**+ 8%**

+ Excluding leukemia
* statistically significant change

Sources: Jablon S., et al. Cancer in Populations Living Near Nuclear Facilities, Volume 2, Table 1-C.22 National Cancer Institute. NIH Pub. No. 90-874. Washington DC: U.S. Government Printing Office, 1990.

4. Breast Cancer Incidence, Females, Three Counties Closest to Peach Bottom, 1999

Age	Cases	Popul.	Crude Rate	1970 Std Pop	Adj. Rate		
0-4	0	13,631	0.0	.084416	0.0		
5-9	0	14,800	0.0	.098204	0.0		
10-14	0	14,653	0.0	.102304	0.0		
15-19	0	14,460	0.0	.093845	0.0		
20-24	1	12,179	8.2	.080561	0.7		
25-34	4	30,213	13.2	.122569	1.6	Chester County	
35-44	54	40,164	134.4	.113614	15.3		
45-54	126	32,083	392.7	.114265	44.9		
55-64	83	17,642	470.5	.091480	43.0		
65-74	101	14,685	687.8	.061195	42.1		
75-84	60	10,462	573.5	.030112	17.3		
85+	22	4,318	509.5	.007435	3.8		
TOT	**451**	219,290	205.7			**168.6**	**(1998 = 154.2)**
0-4	0	15,773	0.0	.084416	0.0		
5-9	0	16,697	0.0	.098204	0.0		
10-14	0	17,264	0.0	.102304	0.0		
15-19	0	16,378	0.0	.093845	0.0		
20-24	0	13,843	0.0	.080561	0.0		
25-34	8	31,492	25.4	.122569	3.1	Lancaster County	
35-44	30	37,229	80.6	.113614	9.2		
45-54	79	30,509	258.9	.114265	29.6		
55-64	67	19,156	349.8	.091480	32.0		
65-74	89	17,550	507.1	.061195	31.0		
75-84	69	14,238	484.6	.030112	14.6		
85+	21	6,229	337.1	.007435	2.5		
TOT	**363**	236,358	153.6			**122.0**	**(1998 = 128.4)**
0-4	0	11,118	0.0	.084416	0.0		
5-9	0	12,555	0.0	.098204	0.0		
10-14	0	13,026	0.0	.102304	0.0		
15-19	0	12,522	0.0	.093845	0.0		
20-24	0	10,056	0.0	.080561	0.0		
25-34	5	26,290	19.0	.122569	2.3	York County	
35-44	40	33,183	120.5	.113614	13.7		
45-54	78	27,315	285.6	.114265	32.6		
55-64	91	16,475	552.4	.091480	50.5		
65-74	76	13,919	546.0	.061195	33.4		
75-84	75	10,853	691.1	.030112	20.8		
85+	24	4,512	531.9	.007435	4.0		
TOT	**389**	191,824	202.8			**157.4**	**(1998 = 143.7)**
0-4	0	40,522	0.0	.084416	0.0		
5-9	0	44,052	0.0	.098204	0.0		
10-14	0	44,943	0.0	.102304	0.0		
15-19	0	43,360	0.0	.093845	0.0		
20-24	1	36,078	2.8	.080561	0.2		
25-34	17	87,995	19.3	.122569	2.4	Total 3 Counties	
35-44	124	110,576	112.1	.113614	12.7		
45-54	283	89,907	314.8	.114265	36.0		
55-64	241	53,273	452.4	.091480	41.4		
65-74	266	46,154	576.3	.061195	35.3		
75-84	204	35,553	573.8	.030112	17.3		
85+	67	15,059	444.9	.007435	3.3		
TOT	**1203**	647,472	185.8			**148.5**	**(1998 = 141.6)**
						U.S. 1998 = 118.1	

Sources: Pennsylvania State Cancer Registry, Harrisburg PA, cancer cases. U.S. Centers for Disease Control and Prevention (www.cdc.gov, data and statistics, CDC Wonder), population.

5. Nuclear Power Plants with Largest Radioactive Releases, 1970-87 (of 72 operating plants)

A. Airborne Iodine-131 and Effluents (all chemicals with half-life of over 8 days)

Plant, State	Total Releases*
1. Dresden, IL	95.58
2. Oyster Creek, NJ	76.80
3. Millstone, CT	32.64
4. Quad Cities, IL	26.79
5. Indian Point, NY	17.46
6. Nine Mile Point, NY	14.61
7. Three Mile Island, PA	14.41
8. Brunswick, NC	14.19
9. Monticello, MN	12.13
10. Turkey Point, FL	6.67
11. Pilgrim, MA	6.56
12. Big Rock Point, MI	6.20
13. San Onofre, CA	4.16
14. St. Lucie, FL	3.59
15. Humboldt Bay, CA	3.41
16. Calvert Cliffs, MD	3.40
17. James A. Fitzpatrick, NY	3.34
18. Oconee, SC	2.43
19. Peach Bottom, PA	2.06

*In trillions of picocuries
+ In thousands of curies

B. Airborne Fission and Activation Gases

Plant, State	Total Releases+
1. Three Mile Island, PA	10,066
2. Dresden, IL	9,255
3. Millstone, CT	6,762
4. Oyster Creek, NJ	5,374
5. Nine Mile Point, NY	3,698
6. Monticello, MN	3,478
7. Humboldt Bay, CA	2,796
8. Browns Ferry, AL	2,490
9. Quad Cities, IL	2,306
10. Brunswick, NC	2,272
11. Big Rock Point, MI	1,690
12. Pilgrim, MA	1,557
13. Peach Bottom, PA	851

C. Liquid Effluents: Mixed Fission and Activation Products

Plant, State	Total Releases*
1. Millstone, CT	580.97
2. Joseph M. Farley, AL	576.73
3. LaCrosse, WI	196.00
4. Nine Mile Point, NY	193.20
5. Surry, VA	180.87
6. San Onofre, CA	161.10
7. Dresden, IL	150.12
8. Browns Ferry, AL	118.56
9. Quad Cities, IL	110.33
10. Arkansas 1-2, AR	102.64
11. Oconee, SC	78.73
12. Cooper, NE	70.79
13. Indian Point, NY	61.03
14. Salem, NJ	60.09
15. Peach Bottom, PA	56.69

Source: Nuclear Regulatory Commission annual reports, reprinted in Gould J. et al., The Enemy Within. New York: Four Walls Eight Windows, 1996.

6. Iodine-131 Concentrations in Pasteurized Milk, Washington DC and Philadelphia
All measurements in picocuries of I-131 per liter of milk

Philadelphia

Month	1985	1986	1987	1988	1989	1990
Jan.	8	2	6	6	-4	3
Feb.	4	-1	5	-1	3	4
Mar.	2	5	2	9	6	-4
Apr.	-	-	3	-2	1	-
May	7	7	3	7	1	7
June	4	7	2	5	4	4
July	3	-	1	6	0	1
Aug.	-3	-2	4	-3	4	-
Sept.	2	5	5	2	6	6
Oct.	5	4	5	3	7	7
Nov.	1	2	4	5	5	1
Dec.	3	3	6	4	6	1

Washington DC

Month	1985	1986	1987	1988	1989	1990
Jan.	-	-	-	-	3	-
Feb.	-	-	-	-	0	-
Mar.	-	-	-	-	3	-
Apr.	-	-	-	5	4	-
May	-	13	4	4	4	-
June	-	10	-	7	-	-
July	-	1	1	2	5	-
Aug.	-	8	-	-	-	-
Sept.	-	5	-	4	-	-
Oct.	-	5	-	7	-	-
Nov.	-	5	-	6	-	-
Dec.	-	-	-	2	-	-

Totals:
U.S. Average 1985-90 for 60 cities = 2.61
Philadelphia 224 picocuries/67 measurements = 3.34 (+28%)
Washington 105 picocuries/24 measurements = 4.38 (+68%)

Source: Office of Radiation Programs. Environmental Radiation Data, Volumes 41-64. U.S. Environmental Protection Agency. Montgomery AL: 1985-1990.

Note: The Environmental Protection Agency stopped reporting monthly levels of Iodine-131, Cesium-137, and Barium-140 in milk in December 1990.

7. Latest Results of Study of Strontium-90 in Baby Teeth

Teeth collected	3800
Teeth processed	1463
Teeth processed, born after 1979	1352

Location (home during pregnancy)	No. Teeth b. after 1979	Avg. pCi Sr90/ g Ca in teeth at birth
Philadelphia area*	**22**	**2.57**
California	106	1.73
Florida	121	2.08
New Jersey	225	1.55
Connecticut	44	0.96
New York		
Suffolk County	544	1.38
Nassau County	59	1.25
New York City	78	1.44
Westchester County	65	1.55
Putnam County	20	1.88
Orange/Dutchess/Ulster County	18	1.86
All other	76	
TOTAL	1352	1.53 (similar to 1956 births)

Philadelphia average is 68% greater than all teeth (2.57/1.53)
* includes southeast Pennsylvania, plus Philadelphia suburbs in New Jersey

Average Sr-90 concentration, by birth year (number of teeth in parentheses)

	Phila. Area	All areas
1990-96	2.72 (8)	1.55 (556)
1980-89	2.45 (14)	1.51 (793)
1970-79	3.32 (7)	2.75 (77)
1960-69	-	3.97 (22)

Philadelphia area teeth have always had higher Sr90 concentrations than other areas. In all areas, there has been an increase from the 1980s to the 1990s, suggesting that a current source of Sr90, most likely nuclear reactor emissions, is building up in children's bodies.

Source: Radiation and Public Health Project, July 16, 2002

8. Changes in Radioactivity Levels in Local Air and Water, 2001

Gross Beta in Drinking Water
(Measured Monthly)

Location	Jan 1-July 31	Aug 1-Dec 31	% Change
4L (8.7 mi. SE of Peach Bottom)	1.90	2.90	+52.6%
6I (5.8 mi. NW of Peach Bottom)	2.00	2.76	+38.0%

Gross Beta in Air Particulate Samples
(Measured Weekly)

Location	(31 weeks) Jan 1 - Aug 5	(21 weeks) Aug 6-Dec 31	% Change
3A (3.6 mi. SW of Peach Bottom)	18.48	23.90	+29.3%
5H2 (30.8 mi. NW of Peach Bottom)	17.19	26.05	+51.5%

Source: Exelon Nuclear Generation Support.Peach Bottom Atomic Power Station Units 2 and 3: Annual Radiological Environmental Operating Report, Number 59, 2001.

9. Prevailing Wind Directions, Cities Nearest to Peach Bottom

Month	Harrisburg	Philadelphia	Wilmington DE	Baltimore MD
Jan.	WNW	WNW	WNW	WNW
Feb.	WNW	NW	NW	NW
Mar.	WNW	SW	WNW	WNW
Apr.	WNW	SW	WNW	WNW
May	W	WSW	S	W
June	W	WSW	S	WNW
July	W	WSW	NW	W
Aug.	W	SW	S	W
Sept.	WNW	SW	S	S
Oct.	W	WSW	NW	NW
Nov.	NNW	WSW	NW	WNW
Dec.	WNW	WNW	WNW	WNW

Number of months with prevailing winds from the
Northwest, West-Northwest, West, West-Southwest, or southwest

Harrisburg - 12
Philadelphia - 11
Wilmington - 8
Baltimore - 11

The majority of any airborne releases from Peach Bottom would be propelled towards the east, including the highly populated areas of southeast Pennsylvania and northern Delaware

Source: Bair FE (ed.). The Weather Almanac, 6th Edition. Detroit: Gale Research Inc., 1992. Wind patterns measured from 1951 to 1963.

Exelon Nuclear

Exelon Nuclear
200 Exelon Way
Kennett Square, PA 19348
www.exeloncorp.com

7/01/02
67 FR 44245
(8)

August 27, 2002

Chief
Rules and Directives Branch
Mailstop T-6D 59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Comments Concerning Draft Plant-Specific Supplement 10 to the Generic Environmental Impact Statement Regarding Peach Bottom Atomic Power Station

Dear Sir:

This letter is being submitted in response to the NRC's request for comments concerning the draft plant-specific Supplement 10 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," regarding the renewal of operating licenses for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, for an additional 20 years of operation.

Exelon Generation Company, LLC appreciates the opportunity to comment on this draft Supplement 10 to NUREG-1437. We agree that the adverse environmental impacts of license renewal for PBAPS are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Specific comments on draft Supplement 10 to NUREG-1437 are provided in Attachment 1.

If you have any questions, please do not hesitate to contact us.

Very truly yours,

Michael P. Gallagher
Director, Licensing & Regulatory Affairs
Mid-Atlantic Regional Operating Group

Enclosures: Attachment 1

Template = SDM-013

E-RIDS = SDM-03
Add = D. Wheeler (DXW)
H. Berrick (HFB)

Comments on Draft Supplement 10 to NUREG-1437
Attachment 1
Page 1 of 3

	Number	Location (pg/line)	What is in DEIS	What should be in DEIS	Why the change
18-1	1	1-11 / 4,7	Excelon	Exelon	Spelling
18-2	2	2-7 / 18	The operation is infrequent ...	This dredging operation is	English
18-3	3	2-7 / 29, 32, 34	'rocket'	This term should be deleted.	The term 'rocket' is a colloquial term that does not come from product literature.
18-4	4	2-8 / 25	Conowingo	Conowingo	Spelling
18-5	5	2-11 / 17	... water storage tank.	... water storage tank, and Torus dewatering tank.	The fourth tank is not named properly.
18-6	6	2-19 / 12	... uses an ammonium chloride-based molluscide ...	uses an Quaternary-amine-based molluscide ...	Correction to what is used.
18-7	7	2-21 / 38	... a consortium of Federal, regional, ...	a consortium of utilities and Federal, regional, ...	The consortium also included utilities.
18-8	8	2-37 / 2, 8	emission stacks	emission stack	There is only one off-gas stack visible at Peach Bottom.
18-9	9	2-37 / 8	There is no visible plume ...	There is no visible vapor plume ...	Clarify that the plume that is being talked about is a water vapor plume.
18-10	10	2-43 / 24	and railroads) were	and railroads, etc.) were	These taxes were collected from more than just the utilities shown.
18-11	11	2-47 / 39	NRC is consulting with the FWS.	NRC has consulted with the FWS.	Consultation has already taken place.
18-12	12	4-15 / 13-15	The designed operation criteria are maintained in part by removal of sediments that are deposited in the canal. Maintenance of the designed depth for the intake canal helps ensure that approach velocities at the screens meet criteria.	These sentences should be deleted.	The impingement criteria are maintained at the outer intake structure. The intake canal, and the sediment removal described here, follow the intake structure and, as such, have no bearing on maintaining the intake velocities necessary to reduce impingement.
18-13	13	4-15 / 19	NPDES Permit PA0009733	NPDES Permit PA 0009733	Correction to the number on the permit.
18-14	14	4-17 / 9	Five mechanical draft cooling towers ...	Three mechanical draft cooling towers are located on berms...	While it is true that five towers were built, the permit now allows for three towers. Since three towers are allowed by permit, there are now three towers standing
18-15	15	4-34 / 33	Historic	Historic	Spelling

ATTACHMENT 1

Comments on Draft Supplement 10 to NUREG-1437
Attachment 1
Page 1 of 3

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18-6	6	2-19 / 12	... uses an ammonium chloride-based molluscide ...	uses an Quaternary-amine-based molluscide ...	Correction to what is used.
18-7	7	2-21 / 38	... a consortium of Federal, regional, ...	a consortium of utilities and Federal, regional, ...	The consortium also included utilities.
18-8	8	2-37 / 2, 8	emission stacks	emission stack	There is only one off-gas stack visible at Peach Bottom.
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Comments on Draft Supplement 10 to NUREG-1437
Attachment 1
Page 2 of 3

	Number	Location (pg/line)	What is in DEIS	What should be in DEIS	Why the change
18-16	16	4-36 / 24-25	The applicant should reflect the aforementioned in its licensing basis commitments and, ...		While Exelon has stated that it did not anticipate any additional land disturbances, or major structural modifications, or maintenance activities beyond previously disturbed areas as a result of license renewal, these were not licensing basis commitments. If it was determined that any of these areas needed to be addressed as a result of license renewal, then the proper Federal, State, and local agencies would be consulted prior to the activity.
18-17	17	4-36 / 26	... not have an effect effect on any ...	... not have an effect on any ...	Remove duplicate wording.
18-18	18	4-36 / 35-36	Given the commitments of the applicant to avoid future disturbances and to control access to lands it manages, ...	Given the commitments of the applicant to limit land disturbances in support of license renewal, ...	Exelon has committed in letters to appropriate agencies, to limit maintenance activities to previously disturbed areas and it has stated that it did not anticipate any additional land disturbances in support of license renewal. No commitments were made to avoid all future land disturbances nor to control access to lands it manages.
18-19	19	4-38 / 6-10	The listing of counties is not correct.	For counties entirely in the 50 mile zone, delete Kent County DE, and add New Castle County DE. For counties partially in the 50 mile zone: add Kent County DE.	Correction to the proper information.
18-20	20	4-38 / 22	... criteria, Table 4-8 indicates ...	..,criteria, Figure 4-1 indicates ...	Correction to the proper graphic.
18-21	21	4-39 / Map	Maryland Counties include Kent and Queen Annes.	Maryland Counties include Queen Anne, but not Kent.	Spelling and correction to the proper information.
18-22	22	4-45 / 30-31	... and its independent analysis, and pending the outcome of consultation with the FWS, it ...	... and its independent analysis, it ...	Delete the pending consultation with FWS since that has already occurred.
18-23	23	4-45 / 34-35	Therefore, it is the staff's preliminary determination...	Therefore, it is the staff's determination ...	Consultation with FWS has been completed.
18-24	24	4-48 / 38	BEIR	Biological Effects of Ionizing Radiation (BEIR)	Spelling of acronym at first usage.

Comments on Draft Supplement 10 to NUREG-1437
Attachment 1
Page 3 of 3

	Number	Location (pg/line)	What is in DEIS	What should be in DEIS	Why the change
18-25	25	4-51 / 13	... isptope ...	... isotope ...	Spelling
18-26	26	4-51 / 35	Considerable of technical literature ...	A considerable amount of literature ...	English
18-27	27	4-58 / 12	Units w and E...DPR44 and Dpr-56	Units 2 and 3...DPR-44 and DPR-56	Spelling
18-28	28	6-6 / 17-21 6-8 / 29-30	On February 15, 2002, subsequent to the ...This change in regulatory status does not cause the staff to change its position....	On July 23, 2002, the President signed into law House Joint Resolution 87 designating Yucca Mountain as the repository for spent nuclear fuel.	Change in status of the Yucca Mountain project.
18-29	29	8-38 / 37	... construc-tion ...	... construction ...	Spelling
18-30	30	8-55 / 7	Pennsylvania Power & Light Company (Exelon)	Exelon Generation Company, LLC (Exelon)	Spelling
18-31	31	F-2 / 24	A.1	F.1	Spelling

STATE OF DELAWARE
DEPARTMENT OF STATE
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS
HISTORIC PRESERVATION OFFICE
15 THE GREEN
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September 9, 2002

Mr. Louis L. Wheeler
Senior Project Manager
License Renewal and Environmental Impacts Program
Division of Regulatory Improvements Programs
Office of Nuclear Reactor Regulations
Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Wheeler:

19-1 We received your March 7 letter regarding the Nuclear Regulatory Commission's (NRC) opinion that for compliance with Section 106 of the National Historic Preservation Act, the presence of any historic property along the Keeney Transmission Line are beyond the area of potential effects. We believe this opinion to be inconsistent with the Advisory Council on Historic Preservation's (Council) regulations and with information provided to this Office during the initiation Section 106consultation for the proposed relicensing of the Peach Bottom Atomic Power Station (PBAPS). In a July 5, 2000 letter sent to Ms. Joan Larrivee, of my staff, from James Hutton, Director of Licensing for PECO Nuclear, Mr. Hutton identified the original undertaking included authorizing the construction in 1974 of the Keeney Transmission Line as the "Only one new transmission corridor [which] was required to integrate PBAPS into PECO Energy's bulk power system when the facility was constructed. This line, from Peach Bottom to the Keeney Substation in Delaware, is the only transmission line/corridor under review during this [current]license

19-2 renewal process." In this letter initiating consultation with this Office, Mr. Hudson effectively identified reauthorizing of the Keeney Transmission line as an element of the licensing renewal, the undertaking, and as part of the Area of Potential Effect, as per the Council's definition of an *undertaking* (36 CFR 800.16(y)) and the project *Area of Potential Effecst* (36 CFR 800.16(d)). Especially important to the definition of undertaking is the notion that it includes "the geographical area or areas within which a undertaking *may directly or indirectly* (my emphasis) cause alterations in the character or use of historic properties, if such properties exist." It is important to note here, there is no discussion of ownership or control which limits the consideration of whether to include any location or property therein within the boundary of the APE. Such limitations would

hamper the ability to adequately identify and consider to the fullest extent, what types and degrees of impact or effect an undertaking would have on historic properties for any type of undertaking at any possible location. The Council does not set such restrictions on determining a project undertaking and its APE. The reauthorization of the Keeney Transmission Line, as part of this project, even though it is not owned or controlled by the licensee is not pertinent to the identification of historic properties and the evaluation of effects which the undertaking may have on those historic properties which are present within the APE. (See the attached information provided by Laura Dean of the Council as it pertains to determining an undertaking's area of potential effect: Points to remember Item #2; and, Colorado River Indian tribes v. Marsh, 605F. Supp.1425 (C.D. Cal. 1985.) Additionally, in the *Lower Delaware Valley Transmission System Agreement, Schedule 3, Revision No.1*, Page 1 of 2, which you included as an attachment to your March 7 letter, there was an agreement for DP & L (now Conectiv) to construct the Delaware section of the Keeney Transmission Line. Essentially, even while the licensee did not construct this line, it was clearly a contractual arrangement to provide the licensee with the facilities to convey power to its bulk power system, as referenced in Hutton's July 2000 letter. It is part of the undertaking and should be included in the project APE.

The identification of the Chesapeake and Delaware Feeder Canal (Feeder Canal), as an historic property within the project APE, was made by my staff during the consultation process. Comments were provided in an attachment to your March 7 letter, prepared by the licensee, as to their opinion on the non-eligibility of this property. It is important to remember that if there are disagreements between the federal agency and the SHPO as to the eligibility of a particular property, it is the federal agency's responsibility, using 36 CFR Part 61 qualified professionals, to seek a formal determination of eligibility from the Secretary of the Interior, pursuant to 36 CFR 800.4(c)(2) of the Council's regulations. To our knowledge this has not been done.

Finally, it is our contention the Feeder Canal, which we believe may be eligible for listing in the National Register of Historic Places, has been and is continuing to be subjected to destruction due to the lack of adequate maintenance of the transmission line. A bridge which was clearly present in the 1950-1960s which crossed the Feeder Canal was either removed or left to deteriorate. Sometime in the 1970's, the canal was filled in crusher run rock to provide access along this transmission line and to specifically cross this body of water. This in filling has resulted in the loss of the physical features of the Feeder Canal where it is crossed by the transmission line and the subsequent blocking of the flow of water within the Canal. It is our opinion, the lack of maintenance and/or retention of a bridge which spanned the canal and the lack of security to prevent unauthorized use of the access road or any other area along the banks of the Feeder Canal within the transmission right-of-way has caused significant deterioration and alteration of the

character of this property and therefore constitutes adverse effects due to destruction and neglect under 36 CFR 800.5(b)(2)(i) and (vi) of the Council's regulations. Towards trying to reverse or correct these adverse effects and to prevent further deterioration, the recommendations made in my October 29 , 2001 letter were presented.

By copy of this letter, we are requesting the Advisory Council to participate in the consultation process and provide guidance on expediting the review for this undertaking, pursuant to Appendix C, Criteria 2 of their regulations. We believe there has been an inconsistent application of their regulations during the Section 106 consultation for the relicensing of the PBAPS and the Keeney Transmission Line.

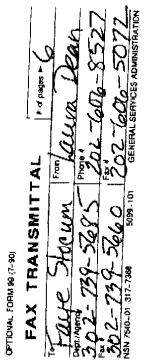
If you have any questions or desire to discuss this matter further, please contact Faye Stocum at the address above. Thank you.

Sincerely,

Daniel R. Griffith
State Historic Preservation Officer

Enclosures

cc: Don Klima, ACHP
Faye Stocum



ibility and inclusion

If a property meets the criteria for inclusion in the National Register, this doesn't automatically result in its being listed. To be listed, a property must be formally nominated using NPS forms and following NPS procedures. Agencies are not required to nominate properties in order to comply with Section 106, although Section 110(a)(2) of NHPA does require agencies to have programs in place for nominating federally owned or controlled historic properties.

If an owner of private property objects to including his or her eligible property in the National Register, they may block it from being listed. Effects on such a property are not exempt from Section 106 review, however, since the property remains eligible for the Register. Private owners may do as they wish with their historic property, provided that they are not receiving Federal assistance or approvals. If they are, the Federal agency involved must comply with Section 106 before the project can be implemented.

Identifying historic properties

Agencies are required to make a "reasonable and good faith effort to carry out appropriate identification efforts. . . " [36 CFR § 800.4(b)(1)] This responsibility rests squarely with the Federal agency and cannot be delegated (with the exception of certain HUD programs). The agency can solicit the help of applicants, grantees, or others to carry out this work, but it is up to the agency to see that the work is carried out properly and to make appropriate use of the results.

In consultation with the SHPO/THPO, the agency determines the scope of needed identification efforts and takes action to identify potential historic properties. The agency then evaluates the significance of those properties and decides whether any could be affected by the undertaking.

Determining an undertaking's area of potential effects

The agency's first step in establishing the scope of needed identification efforts is to determine the undertaking's **area of potential effects**. This is done in consultation with the

SHPO/THPO. [36 CFR §800.4(a)(1)] The area of potential effects (APE) is defined as:

> *. . . the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.* [36 CFR § 800.16(d)]

If there is disagreement concerning the extent of the APE, the consulting parties may seek guidance and assistance from the Council. Also, the Council can elect to issue an advisory comment to the agency on its APE determination. [36 CFR § 800.9(a)] If this occurs, the agency has to consider the views of the Council in reaching a final decision regarding the boundaries of the APE.

Points to remember. When defining an area of potential effects (APE), agencies need to remember that:

1. The APE is defined before identification begins, when it may not yet be known whether any historic properties actually are within the APE. To determine an APE, it is not necessary to know whether any historic properties exist in the area.

2. An APE is not determined on the basis of land ownership.

3. The APE should include:

- all alternative locations for all elements of the undertaking;
- all locations where the undertaking may result in disturbance of the ground;
- all locations from which elements of the undertaking (e.g., structures or land disturbance) may be visible or audible;
- all locations where the activity may result in changes in traffic patterns, land use, public access, etc.; and

project. The Corps prepared the plan and obtained the Council's concurrence in the plan in 1983.

The court rejected plaintiffs' claim that the Corps had not complied with the provision of the MOA that required a treatment plan. First, the court determined that Section 800.6(c)(3) of the Council's regulations, which states that a ratified MOA shall evidence satisfaction of the Federal agency's responsibility under Section 106 of NHPA, creates a "presumption of compliance." 567 F. Supp. at 989-90. Even without this presumption, the court held that the Government's documents demonstrated compliance with the terms of the MOA. *Id.* at 990.

The court dismissed plaintiffs' NHPA claims and held that further action withholding possession of the condemned lands on these grounds would not be warranted. *Id.* The Fifth Circuit affirmed. 733 F.2d at 380.

The district court also found that the Corps' programmatic environmental impact statement (EIS) prepared under the National Environmental Policy Act on the entire waterway project sufficiently addressed the impacts of the project on cultural resources. No site-specific EIS for Cedar Oaks and Barton township was needed. 567 F. Supp. at 991. The appellate court affirmed. 733 F.2d at 381.

87

***Colorado River Indian Tribes v. Marsh*, 605 F. Supp. 1425 (C.D. Cal. 1985).**

Plaintiffs, Indian tribes and an environmental organization, sought to enjoin the U.S. Army Corps of Engineers from issuing a permit to a developer for the placement of riprap along the western shore of the Colorado River in California. The purpose of the riprap was to stabilize the riverbank and establish a permanent boundary line for private property that the developer proposed to subdivide and develop into a residential and commercial community. The site of the development, known as the River City project, was directly across the river from the Colorado River Indian Reservation and directly south of additional portions of the reservation lying on the west side of the river. The land abutting the development site on the west was owned by the United States and administered by the Bureau of Land Management (BLM) of the Department of the Interior. The BLM land, an archeological district, included several significant cultural and archeological sites.

The developer applied to the Corps for the riprap permit in April 1978. The following fall, the Corps prepared an environmental assessment under the National Environmental Policy Act (NEPA) and concluded that, because significant impact upon the environment would result from the developer's proposed project, an environmental impact statement (EIS) should be prepared. The draft EIS was prepared and published in September 1979. In January 1981, the Corps informed the developer that a thorough cultural resources survey of resources on and near the proposed development site was needed before the Corps could complete the final EIS.

In June 1981, however, before the survey was begun, the Corps retracted the draft EIS as a result of changes in Corps policy regarding its jurisdictional authority and announced that no EIS and no further cultural resource evaluation were required. The Corps' decision to retract the draft EIS was apparently made in conformity with its proposed cultural resource regulations published in 1980, regulations that had never been adopted in final form or incorporated into the Code of Federal Regulations.

Under the proposed regulations, the Corps was required to assess both direct and indirect effects of its permits on properties listed or officially determined eligible for listing in the National Register of Historic Places. This review requirement extended beyond the area in which the permit would have direct physical effects to the "affected area," that area within which direct and indirect effects could be reasonably expected to occur.

For properties that were not listed or officially determined eligible for listing in the Register, but that might be eligible for the Register, the proposed regulations limited the Corps' review to the area within the Corps' jurisdiction—the "permit area," defined as that area which would be physically affected by the proposed work.

The Corps issued the riprap permit to the developer on May 21, 1982. Plaintiffs then filed this action, alleging that the Corps failed to comply with NEPA and the National Historic Preservation Act (NHPA).

After discussing the factors that must be present for a preliminary injunction to be granted, the court addressed the likelihood of plaintiffs' success on the merits of their case. Defendants first contended that no EIS was necessary under NEPA because Federal involvement in the River City project was minimal and "major Federal action" was therefore lacking. The court disagreed, finding that NEPA requires assessment of both direct and indirect effects of a proposed Federal action on both "on site" and "off site" locations. 605 F. Supp. At 1433. That there was minimal Federal involvement in the project did not excuse defendants from compliance with NEPA, for "it is not the degree of Federal involvement that influences the standard of living of our society, but is instead the potential and degree of impact from development that bears upon the overall welfare and enjoyment of our society." *Id.* at 1432. "Major Federal action" does not have a meaning under NEPA independent of "significantly affecting the quality of the human environment." *Id.* at 1431.

The Corps' limitation of the scope of its environmental assessment of the bank stabilization activities and its resulting conclusion that there would be no impact on cultural resources were improper and contrary to the mandate of NEPA. *Id.* at 1433.

The court next addressed plaintiff's claim that the Corps had violated NHPA by distinguishing between properties actually listed in or determined eligible for the National Register and properties that might be eligible for the Register and by affixing different historic review responsibilities to each. The court held that this distinction between properties and different scopes of responsibility was at odds with NHPA and the regulations of the Advisory Council on Historic Preservation implementing Section 106 of NHPA. *Id.* at 1438. Using the Council's definition of "eligible property" in Section 800.2 of its regulations as encompassing all properties that meet the criteria for inclusion in the Register, the court concluded that, in enacting NHPA, Congress intended to protect all properties that are of inherent historic and cultural significance and not just those that have been "officially recognized" by the Secretary of the Interior. *Id.* The court cited Executive Order No. 11593 and Section 110(a) of NHPA as support, finding that Federal agencies must exercise caution to ensure the physical integrity of those properties that appear to qualify for inclusion in the National Register. *Id.* at 1435.

The Corps' action in assessing the effects on properties that might qualify for inclusion in the National Register solely within the "permit area" and its failure to survey and consider the effects on like properties in the broader "affected area" was a breach of its responsibilities under NHPA. *Id.* at 1438.

Finally, the Court granted a preliminary injunction, finding that irreparable harm to cultural and archeological resources as a result of the development was possible. *Id.* at 1434-39.

88

***Sierra Club v. Watt*, No. CV-83-5878 AWT (C.D. Cal. Nov. 18, 1983), *aff'd sub nom. Sierra Club v. Clark*, 774 F.2d 1406 (9th Cir. 1985).**

Plaintiffs challenged both the Bureau of Land Management's (BLM) California Desert Conservation Management Plan, which designated a

Parris N. Glendening
Governor

Kathleen Kennedy Townsend
Lt. Governor

Maryland Department of Natural Resources
POWER PLANT ASSESSMENT DIVISION
Tawes State Office Building, B-3
Annapolis, Maryland 21401-2397

J. Charles Fo
Secretary

Karen M. Wh
Deputy Secret

September 13, 2002

Chief
Rules Review and Directives Branch
Division of Administrative Services
Mailstop T 6 D 59
U. S. NRC
Washington, DC 2055-0001

Dear Sir:

We have reviewed the draft document entitled *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Peach Bottom Atomic Power Station (APS), Units 2 and 3* (NUREG-1437, Supplement 10). On behalf of the State of Maryland, the Department of Natural Resources (DNR) Power Plant Research Program (PPRP) has been involved with this license renewal, specifically reviewing issues that are of concern and interest to the State of Maryland.

Our review of this document reflects our knowledge of power station operations, both fossil-fired as well as nuclear, and input received from other Maryland agencies. Based on review of this draft document, the State of Maryland concurs with Staff conclusions that adverse environmental impacts of Peach Bottom APS license renewal are not so great that preserving the option of license renewal would be unreasonable. However, your Staff in updating and finalizing the document may consider the following comments.

Fish and Shellfish Impingement

In Section 4.1.3, the text indicates that Exelon has conducted studies at the Peach Bottom site during the fall season to assess the impingement of outmigrating juvenile American shad and river herring. This was accomplished by examining intake screens at Units 2 and 3 three times weekly from October 18 through December 20 (23 sample dates) (page 4-15).

20-1 This text is somewhat confusing in that it can be interpreted as meaning that only 23 samples were taken at the plant and that the numbers impinged should be extrapolated to determine the total annual impingement. However, we are aware that each of the samples represents a

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cumulative sample -since the prior sample- such that the numbers of fish reported from the 23 samples represents the total number impinged over the study period. We suggest that clarification is necessary to substantiate the conclusion that impingement is not regarded as significant.

20-2 In the same section, on page 4-16, the statement is made that the losses of shad and river herring due to impingement are a very small percentage of the total number of outmigrating fish and that fish losses are not sufficiently high to pose a threat to the fish restoration effort. While the numbers are small at the present time, the Anadromous Fish Restoration Cooperative 2002 for the Susquehanna River anticipates much larger run sizes in the future. With significant population increases, the numbers impinged may increase and could begin to assume significance. Because current EPA regulations require that PBAPS renew its NPDES permit every five years, we recognize and accept that this issue can be addressed and, if necessary, mitigated through the NPDES process at the time of each renewal. We suggest here, however, that this document in its final version should note that an expected increase in abundance of migratory fishes as a result of restoration efforts could result in an increase in impingement, but that such impingement impacts will be captured and addressed by the NPDES permitting process.

We appreciate having the opportunity to comment on the draft *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants: Supplement 10 Regarding Peach Bottom APS.*

Sincerely,

Richard McLean
Manager, Nuclear Programs

RM:rd

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO

September 13, 2002

ER 02/0570

7/1/02
67FR44245
(11)

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, D.C. 20555-0001

Dear Sir:

The Department of the Interior has reviewed draft Supplement 10 (NUREG-1437) to the Generic Environmental Impact Statement for the Peach Bottom Atomic Power Station (Peach Bottom), Units 2 and 3, located on the Susquehanna River in Lancaster County, Pennsylvania. Please give these comments careful consideration in preparing final Supplement 10.

General Comments

The Department shares a goal with the Nuclear Regulatory Commission (NRC) to bring Peach Bottom into compliance with current environmental regulations. With the advances in our understanding of ecological relationships, it is appropriate and useful that federal and state natural resource agencies use the license renewal process to review site conditions in order to maintain the highest level of environmental protection. The following comments are intended to assist the NRC with protection of natural resources.

Specific Comments

Thermal Releases

21-1 We recommend the inclusion of "thermal release" in final Supplement 10 as a "source of potential or known impact." One of the reported negative effects of thermal discharges is increased incidence of disease and parasites in fish attracted to the plume. Dr. John Cairns of Virginia Polytechnic Institute may have published on this and related subjects, and we suggest he be consulted. He can be reached at the Center for Environmental and Hazardous Materials Studies, 1020 Derring Hall, VPI&SU, Blacksburg, VA 24061-0415 (telephone: 703-231-5538).

Template = ADM-013.

E-RIDS = ADM-03
Add = D. Wheeler (DXW)
H. Berrick (HFB)

21-2 As a means to avoid adverse impacts to aquatic life, the Department recommends that NRC require upgrading of this project to include a closed cooling system instead of the existing open cooling system.

Fish Entrainment and Impingement

Peach Bottom is licensed to Excelon (formerly known as Philadelphia Electrical Company, or PECO) and is located in York County on the lower Susquehanna River. Since Peach Bottom came online in 1974, it has withdrawn water for cooling from Conowingo Pond, which is the lower-most pool on the Susquehanna River. The U.S. Fish and Wildlife Service (USFWS) is restoring American shad to the Susquehanna river basin. During the autumn outmigration period, juvenile American shad pass downstream through Conowingo Pond.

RMC Environmental Services (RMC) has been contracted by PECO to evaluate entrainment at the Peach Bottom cooling water intake. RMC examined intake-screen-wash samples for juvenile American shad over the last eight autumn outmigration periods. RMC found juvenile shad impinged each year, except 1987-1988 when Peach Bottom was shut down. Samples were taken three times each week and represented the total accumulation of impinged fish. The number of impinged juvenile shad found has ranged from a high of 341 fish in 1986 (October 14 -
21-3 December 10) to a low of 3 fish in 1989 (August 22 through November 22). This level of mortality, by itself, is not considered detrimental to the Service's restoration program, but the loss must be considered within the context of other sources of loss. These numbers are expected to increase as the number of American shad restored to the Susquehanna River also increases.

About two dozen species of fish were found impinged on intake screens (R. St. Pierre, USFWS, personal communication) totaling about 3000 fish within a three-month sampling period for the sampling season of 2001. Species included riverine fish as well as shad species. Of the species found, those making up the bulk of the fish biomass found include channel catfish (1326), gizzard shad (1281), blueback herring (105), bluegill (71), American shad (65), largemouth bass
21-4 (17), white crappie (15) and yellow perch (11). At a minimum, the applicant should establish a year-round screen sampling protocol to account for year-round fish losses.

21-5 Excelon uses traveling mesh screens and a spray wash system together to reduce or minimize impacts to fish. To further minimize the impacts, in the process of replacing worn or damaged screens, the screens should be replaced with mesh size less than or equal to one millimeter. Additionally, entrance velocities should be less than or equal to 0.5 feet per second (Gowan and Garman 1999). Impinged biota should be removed from the traveling screens and returned to the river.

Decommissioning Facilities

21-6 The draft Supplement 10 contains an evaluation of partial or total decommissioning of existing facilities as the alternative to relicensing. Such analysis should answer at least the following

additional questions: How would contaminated facilities and unused or spent fuel be disposed? How would the project sites be reclaimed? What would be the consequences for fish and wildlife resources and their habitat at both the former project sites and disposal areas?

Exposure to Radiation

21-7 A thorough review should be made on the effects of various levels of radiation exposure on fish and wildlife resources and their habitats. Such exposure may result from leakage, accident (e.g., Three Mile Island, Chernobyl) or disposal. [We suspect that the risk of radiation exposure over time may increase, despite planned maintenance as plants age.]

Transmission Lines

21-8 **Contaminant Management on Rights-of-Way:** Transmission towers frequently leach zinc, which is toxic to vegetation and creates bare soil areas. PCBs often leak from old transformers. Remediation is possible and should be a condition of relicensing. Herbicide use should be minimized.

21-9 **Erosion Control on Rights-of-Way:** Transmission lines are frequently kept in early stages of succession, grassed or farmed. Soil erosion from these areas contributes to the degradation of streams, rivers, and bays by adding nutrients, sediment, and pollutants of concern in the Chesapeake and Delaware Bay drainages. We recommend that rights-of-way be maintained to avoid erosion of sediments into surface waters. One measure to control erosion would be to maintain multiple vegetative strata to reduce splash, sheet and gully erosion.

21-10 We suspect that many transmission line corridors expand opportunities for various forms of recreation. Some of these (i.e., off-road vehicle use) may result in alteration, degradation or destruction of fish and wildlife habitats, particularly streams and wetlands, as well as the harassment and disturbance of wildlife. We recommend that controlled public use of rights-of-way (type and season) to avoid such degradation be a condition of relicensing.

21-11 **Wildlife Management on Rights-of-Way:** Multiple strata of vegetation would also create feeding and nesting cover for some migratory bird species, while perhaps reducing the effects of forest fragmentation on others. The Department is concerned that fragmentation of large forest blocks is reportedly contributing to the population decline of some area-sensitive migratory birds.

Appropriate management of rights-of-way would make considerable land available for wildlife. This has been demonstrated in Maryland and discussed in the transmission line document prepared by the USFWS's Power Plant Team (*Management of Transmission Line Rights-of-Way for Fish and Wildlife*, Vol. I, Background Information. FWS/OBS-79/22).

21-12 Transmission lines kept in early successional stages prevent nesting by birds requiring tree cavities. Excellent management opportunities exist to enhance some rights-of-way by providing

and maintaining nest boxes for cavity-nesting species like bluebirds, great crested flycatchers, wrens, and chickadees displaced from areas where forest has been cleared.

Right-of-Way Routing: Some migratory birds, particularly waterfowl and herons, will not fly within one-quarter mile of powerlines, depending on lighting (time of day) and the reflectivity of the line. This effectively takes valuable migratory bird habitat when transmission lines cross

21-13 wetlands. We recommend that plans for routing existing lines to avoid wetlands be developed in consultation with the USFWS as part of the relicensing process.

21-14 **Maintenance of Rights-of-Way:** To avoid and minimize taking migratory birds, active nests, and their eggs, we recommend that time-of-year restrictions on vegetation clearing and maintenance on rights-of-way be part of any license or amendment. In the Northeast, such restrictions would include the primary migratory bird nesting season from April 1 to July 15 (for raptors, it is February 1 to July 15). Buffers around active raptor nests of at least 100 meters may be sufficient. In addition, activity within a 100-meter radius of raptor nests should be avoided from February 1 through July 13.

Cumulative Impact Evaluations

21-15 We recommend that secondary and cumulative evaluations of this project be primarily quantitative, that nuclear plants be considered along with the "other sources" of cumulative impacts, and that cumulative impacts to avian and terrestrial resources be included along with

21-16 aquatic resources. We also recommend that ichthyoplankton be considered with aquatic resources.

21-17 One question that should be evaluated is the cumulative impact of impingement and entrainment on finfish or other aquatic life in the Conowingo Pool area. To answer this question, NRC or Excelon would first need to know the losses from all water intakes in the water body; the finfish population size, dynamics, exploitation, structure, etc; and how the impingement/entrainment losses are partitioned among the various intakes. This information is useful for determining where, when, and under what conditions entrainment and/or impingement losses cause an observable effect on fish populations or other aquatic life. This question will be difficult to answer without sufficient advance preparation, however.

21-18 We also recommend that the cumulative effects of transmission line operation and maintenance be part of the evaluation. Topics such as forest fragmentation, electromagnetic field effects, bird collisions, and contaminants should be explored.

21-19 As implied elsewhere, Excelon should identify state-of-the-art technology, design, operation and maintenance for cooling water systems, transmission lines and other operating features of nuclear plants. These features should be incorporated into the cumulative impact analyses and the existing projects when appropriate during the relicensing process.

Mitigation

21-20 Currently, there are no provisions for mitigating impacts to Susquehanna River fish caused by impingement by the intakes at the Peach Bottom facility. The current fish collection practices conducted by the licensee's consultant, Normandeau, while useful for monitoring shad mortality, cannot be considered an acceptable form of mitigation. As a long-term (for the life of the license) mitigation practice we find this practice inappropriate. Although the current level of mortality of American shad, by itself, is not considered detrimental to the Shad Restoration Program, the loss must be considered within the context that fish mortality numbers are expected to increase as the number of American shad restored to the river also increases. Additionally, the losses of resident fishes are not accounted for. In this context, we strongly recommend that NRC and Excelon determine the impact on all finfish, not only American shad, and other aquatic life due to impingement in the Peach Bottom water intake in the Conowingo Pool, and that appropriate long-term mitigation measures be developed and implemented by the licensee to mitigate for riverine and anadromous fish losses.

Fish and Wildlife Coordination Act

21-21 Relicensing has the same consultation requirements as original licensing under the Fish and Wildlife Coordination Act (FWCA). Consultation under NEPA does not supplant the need for consultation under FWCA; although these laws are similar, they do not have the same requirements with respect to fish and wildlife, and reporting by the USFWS. As Excelon develops an application for relicense, the USFWS should be consulted during scoping of issues, study needs, and interpretation of results. Draft applications should be made available by the applicant for review and comment. The USFWS comments (i.e., FWCA report) will be provided to the applicant and should be part of their application submitted to the NRC. That report should be considered by NRC when preparing the EIS for the plant. There may be a need for further consultation under the FWCA on NRC's preferred alternative if the "Federal Action" will be significantly different than that proposed by the applicant.

21-22 The Department appreciates NRC's request for comments on the draft Supplement 10 and is willing to cooperate further to the extent that we can. At the same time, the USFWS requests that the NRC initiate consultation under the FWCA for relicensing nuclear power plants. The Service does not believe that either the equal consideration or mitigation planning provisions of the FWCA are satisfied by the NEPA process alone. To fully consider the protection of fish and wildlife resources and their habitats affected by each plant, NRC should request that the Service provide NRC with reports in accordance with the FWCA which should be part of NRC's decision document.

Summary of Recommendations

The Department recommends that the NRC adopt the following recommendations in order to maintain optimum protection of natural resources at the Peach Bottom Atomic Power Station:

21-23 1. Require system upgrading at this project to include a closed cooling system instead of the existing open cooling system.

21-24 2. Evaluate the potential consequences of decommissioning (contaminated facilities and unused or spent fuel disposal, reclaiming project site, consequences for fish and wildlife resources and their habitats at former project sites and disposal areas) in the alternatives analysis for relicensing.

21-25 3. Require the intake screen replacements to have a mesh size of one millimeter or less intake water velocities less than 0.5 feet per second, and return biota collected by the traveling screens returned to the river.

21-26 4. Require maintenance of transmission line right-of-ways for wildlife feeding cover and nesting activities, while minimizing habitat degradation and encouraging habitat enhancements.

21-27 5. Require applicant to maintain multiple layers of vegetative cover in transmission line rights-of-way to reduce or control splash, sheet and gully erosion.

21-28 6. Require controlled public use of transmission line rights-of-way (type and season) to avoid erosion and sedimentation.

21-29 7. Require an assessment of cumulative impacts of all projects from all water intakes in the Conowingo Pool area, including finfish population size, dynamics, exploitation, and structure, and, the partitioning of impingement/ entrainment losses among the various intakes.

21-30 8. Require an assessment of cumulative effects from transmission line operation and maintenance, including forest fragmentation, electromagnetic field effects, bird collisions, and contaminant issues.

21-31 9. Require development and implementation of an appropriate year-round assessment method for evaluating Susquehanna River fish losses and a mitigation plan for losses of Susquehanna River fish (resident and anadromous) caused by intake impingement.

21-32 10. Initiate and continue consultation with the USFWS under the FWCA for the relicensing of the Peach Bottom Nuclear Power Plant.

We appreciate the opportunity to review the draft environmental document and provide comments on natural resource protection. If you have any questions regarding the these comments, please contact Jennifer Kagel of the USFWS's Pennsylvania Field Office at (814) 234-4090.

Sincerely,

Michael T. Chezik
Regional Environmental Officer

cc:
A. Hoar, FWS, Hadley, MA
J. Kagel, FWS, State College, PA

Reference

Gowan, C. and G. Garman. 1999. Design criteria for fish screens in Virginia: Recommendations based on a review of the literature. *Prepared for:* Virginia Department of Game and Inland Fisheries, Richmond, VA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

SEP 17 2002

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington DC 20555-0001

Re: Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants; Supplement 10 Peach Bottom Atomic Power Station , Units 2 and 3. NUREG-1437

Dear Sir/Madam:

In accordance with the National Environmental Policy Act of 1969 and Section 309 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Power Plants; Supplement 10 Peach Bottom Atomic Power Station , Units 2 and 3. EPA has assigned the GEIS a rating of LO-1 (Lack of Objections / Adequate), which indicates that we have no objections to the proposal and that the GEIS adequately addressed the environmental impacts of the proposed alternative. General comments and a copy of EPA's ranking system are enclosed for your information.

Thank you for the opportunity to review and comment on this project. If you need additional assistance the staff contact for this project is William Arguto, he can be reached at 610-814-3367.

Sincerely,

William Hoffman, Acting Director
Office of Environmental Programs

Enclosures

Re: Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants; Supplement 10 Peach Bottom Atomic Power Station , Units 2 and 3. NUREG-1437

General Comments:

22-1 Please elaborate on the term "staff" used frequently throughout the EIS. Specifically, the relationship of the Staff to the NRC and Exelon.

22-2 Are Emergency Planning and Community Right to Know (EPCRA)313 reporting requirements considered or are any of the EPCRA requirements applicable to this supplement.

22-3 Is there any information contained in document that is sensitive or classified, that should be removed or made available through different means?

22-4 Section 2.2.3 - Are there any storm water control measures or requirements that are considered in water quality or resource issues.

22-5 Section 4.1 - Accumulation of contaminants in Sediment, Page 4-6. Is there routine monitoring of sediments to assess changes in conditions.

22-6 Section 4.1.1 - Water Use Conflicts - Are drought conditions incorporated into water use conflict planning. Minimum monthly average flows are discussed but not discrete significant events or worse case conditions.

22-7 Section 4.1.2 - A 1977 NPDES permit is referenced and the best technology available for the intake structure for minimizing adverse environmental impacts. Although subsequent permit reviews have required no further entrainment studies is this still the best technology available?

22-8 Section 4.2.1 Electromagnetic fields, acute effects. - Are there any considerations for anticipating what would trigger a concern for future effects during the license renewal term? For example, if additional transmission lines are added in the area will it change the conclusion of this section.

Environmental Impact Statement (EIS) Rating System Criteria

RATING THE ENVIRONMENTAL IMPACT OF THE ACTION

LO (Lack of Objections) - The review has not identified any potential environmental impacts requiring substantive changes to the preferredalternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.

EC (Environmental Concerns) - The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.

EO (Environmental Objections) - The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental Objections can include situations:

1. Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;

2. Where the federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;

3. Where there is a violation of an EPA policy declaration;

4. Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or

5. Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.

EU (Environmentally Unsatisfactory) - The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:

1. The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;

2. There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or

3. The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.

RATING THE ADEQUACY OF THE ENVIRONMENTAL IMPACT STATEMENT (EIS)

1 (Adequate) - The draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

2 (Insufficient Information) - The draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the proposal. The identified additional information, data, analyses, or discussion should be included in the final EIS.

1 (Inadequate) - The draft EIS does not adequately assess the potentially significant environmental impacts of the proposal, or the reviewer has identified new, reasonably available, alternatives, that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. The identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. This rating

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September 27, 2002

Mr. Duane A. Neitzel
Battelle Northwest
P.O. Box 999 (K6-85)
Richland, Washington 99352

***** *Via Email (duane.neitzel@pnl.gov)* *****

Dear Duane:

Per your request relative to the abnormalities observed on fish collected in Conowingo Pond, given below is my formal response.

We began fish sampling in Conowingo Pond in 1966 with the construction of Muddy Run Pumped Storage Station, about 6 miles upstream of PBAPS on the east shore. Sampling gear included trawl, trap nets, seines, gill net, and electrofishing. We have also operated the west fish lift at Conowingo Dam since 1972 and the east fish lift since 1991. At the west fish lift, fish are sorted, counted, and targeted migratory species transported or used for studies as designated by the regulatory agencies. At the east fish lift, fish were treated similarly between 1991 and 1995 until the fish lifts became operational at Holtwood and Safe Harbor dams in 1996. Since 1996 we have operated fish lifts at Holtwood Dam (7 miles upstream of PBAPS) and fish Safe Harbor Dam (7 miles upstream of Holtwood). Fish collected in these sampling efforts were examined, counted, either a subsample preserved or released back to the river, or allowed to continue movement upstream. I would "guesstimate" we have handled over 20 million fish of over 60 species during this period. The only abnormalities we've observed, on rare occasions, were scoliosis (bent back) on channel catfish or sores on brown bullhead, a situation commonly seen in catfish forms. In the earlier sampling period (1966 to 1980) we were on Conowingo Pond essentially on a daily basis, less frequently thereafter. As a side note, the operation of PBAPS was shut down by NRC order from 1987 to 1989. Our most recent sampling, mostly between June and October, occurred in 1996 to 2000. Additionally, we check fishes impinged on screens at PBAPS during the downstream migration of juvenile American shad.

I hope the above observations help you. If you have further questions, please do not hesitate to call me at 717-548-6430.

Sincerely,

Dilip Mathur

Dilip Mathur
Sr. Fisheries Scientist / Vice President

Enclosures

DM/cll

cc: Paul Harmon, George Nardacci, Eric McClellan, Ray Bleistine (Normandeau)
Tracy Siglin, Bob Matty, Bill Maher (Exelon)

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Nuclear Regulation Committee)

You are all accountable for supporting the contined operating of Peach Bottom Nuclear Reactor Plant.

23-1 When theres a disaster and Millions dead then will you Stop the insanity OF Nuclear energy.

23-2 Only to build Nuclear Bombs with the old waste products do you use Nuclear power.

23-3 Why not do something Safe. You are accountable not me for that death trap.

23-4 I will seek alt Safe alternatives.

23-5 You people are crazy to keep that kind of plant in operation.

23-6 Be forwarned. You are accountable for your choice I am for stopping all Nuclear energy plants NOW!

23-7 We have technology to keep us all Strong & healthy. Wind Generators Magnetic generator Steam generators ect

23-8 When will your nightmare end

DEPARTMENT OF HEALTH
...in pursuit of good health

(717) 783-4677

November 12, 2002

Chief, Rules and Directives Branch
Division of Administrative Services
Mail Stop: T6-D59a
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sir or Madam:

This letter provides information related to the NRC staff environmental review being performed for the proposed license renewal of Peach Bottom Atomic Power Plant, Units 2 and 3 (Docket Nos. 50-277, 50-278).

Sincerely,

Joel H. Hersh, M.Ed., M.P.A.
Director
Bureau of Epidemiology

Pennsylvania Department of Health ♦ P.O. Box 90 ♦ Harrisburg, PA 17108

Review of the Radiation and Public Health Project's

"Comment on Environmental Issues Regarding Exelon Corporation Proposal to the U.S. Nuclear Regulatory Commission To Re-License the Peach Bottom 2 and 3 Reactors"

by

Gene Weinberg, MPH, DRPH
Pennsylvania Department of Health.

Calculation of Age-adjusted Rates

The incidence and mortality rates presented in the report are all age-adjusted. While it is not feasible to check each population (denominator) and every numerator (deaths, incidence), the methodology appears to be correct. I recalculated several rates and each matched the table.

Cancer Death Rates – All Cancers Combined

The authors use the geographic and temporal distributions of cancer deaths to describe the effects of ambient radiation levels on the population's cancer burden. The report states that cancer death rates in York and Lancaster Counties increased as a result of the start-up of the Peach Bottom Units 2 and 3. A change in the cancer death rates from 3.0 percent below the U.S. rate prior to start-up, to 2% higher than the U.S. rate after the units became operational are described.

With the exception of those cancers with a short survival (stomach, lung, liver, pancreas), death rates are inappropriate for measuring the cancer risk in a population; incidence rates should be used. Cancer mortality is determined by many factors, including; the incidence rate of the disease, severity, health care, competing causes of death, and coding rules. For cancers with long survival, death rates are useless. Thyroid cancer is the best example; survival is nearly 100 percent. For every 12 new cases that occur in Pennsylvania, there is only one death.

Cancer is a group of diseases, each with different tissues of origin, different pathology, and risk factors. Therefore, lumping all types together is meaningless. The total

cancer rate is the net effect from factors specific to the individual types. The following have caused large increases in total cancer incidence in Pennsylvania independent of any risk factors in the environment; a) Screening ; As a result of breast and prostate cancer screening,, the number of cancers increased 7,000 between 1985 and 1992, b) Personal Risk Factors; Changes in smoking patterns of women resulted in increasing incidence of lung from 2,600 cases 1985 to almost 3,900 in 1995; Better Diagnostic Methods have resulted better case-finding and in higher incidence, for example brain and colon cancers.

Differences in disease rates between populations are expected, for no other reason than random variation. The change from 2 percent lower to 3 percent higher than the U.S. rate, should be considered "no difference".

Cancer Death Rates -- Site Specific

Changes in death rates for the most radiosensitive tissues (organ sites) are presented. When compared to the rates for the U.S., there is a net increase in the county death rates. Again, all the limitations of mortality data apply. The most significant risk factors are not considered. For example, a major determinant of breast cancer risk is hormonal status. Women who had their first child after age 32 have twice the risk as women who had their first child before age 20. Age at menopause also determines life-long estrogen exposures and breast cancer risk. Because women of higher social class tend to start families at an older age, this group has a greater risk of developing breast cancer. Because of the socioeconomic characteristics of a population and changing demographics, breast cancer rates might be elevated. **For 1994-1998 both the breast cancer incidence rate and mortality rate for York and Lancaster Counties were lower than the state.** For many cancers the causes are not currently known, though important risk factors have been identified. These should be addressed. Viruses likely play a role in the etiology of Hodgkin's disease other lymphomas, as well as leukemia. Occupational exposures to aromatic hydrocarbons (benzene) likely increase rates in some groups. Chronic immune stimulation by viruses and other health conditions (bronchitis, bowel disease, allergies) may contribute to the risk of multiple myeloma. There is increasing evidence that cigarette smoking contributes to leukemia risk. Consequently smoking patterns may affect cancer rates in other radiosensitive organs.

In addition to radiation, there are a number of risk factors for thyroid cancer. Both iodine deficiency and iodine excess can cause thyroid cancer. Consequently, cruciferous vegetables appear to be protective, while seafood may increase risk. There appears to be an association with breast cancer risk. Like breast cancer, the influence of estrogens and other endocrine hormones can affect risk. External, acute, childhood x-radiation is carcinogenic for long periods of time. The greater the exposure, the greater are the chances of developing thyroid cancer. Prior to 1960, there were significant iatrogenic sources; dental, treatment of skin disease, tonsillitis, and thyroid conditions. These were far greater than sources from atomic energy, and have been linked to rising incidence.

Dose-Effects

The potential effects from radiation exposure are established, but only at very high doses. **Though the authors maintain that Peach Bottom releases contributed to unusually high cancer rates, epidemiological studies and studies of biological effects of low dose radiation do not support this.** Based on risk assessments from the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the Biological Effects of Ionizing (BIER) III Report of the National Academy of Sciences, the exposures could not have affected either incidence rates or mortality rates in these counties. Each of these report similar excess risks They determined that if 1,000,000 people are each exposed to 1,000 millirem (1rem each), between 110 and 120 extra cancers would occur over their lifetimes. In any normal population of 10,000 people about 30 percent (3,000) will be expected to develop cancer according to the American Cancer Society. If that same group received 1,000 millirem of radiation, 3 more cancers might develop, of which 2 may be fatal, however it would be impossible to distinguish which cancers resulted from the exposures.

Radiation exposures from nuclear power plants are extremely low. Based on 1980 data, for persons living from 1 mile to 35 miles from nuclear power plants, the total dose from all pathways is between a low of 0.00001 millirem to a high of 0.05 millirem. In contrast, the average person in the United States receives about 100 millirem per year from natural

background sources; cosmic rays, building materials, internal, ground, and dental exposures add about 90 millirem.

Discussion

The conclusions of the report, "*Environmental Issues Regarding Exelon Corporation Proposed to the U.S. Nuclear Regulatory Commission To Re-License the Peach Bottom 2 and 3 Reactors" by* the Radiation and Public Health Project can not be supported. There are several methodological problems. This is an ecological study not an analytical study. The evidence presented is built on correlating cancer rates in populations to their proximity to atomic energy facilities. This approach fails to consider actual human exposures, the doses, established dose-response curves for low levels of exposure, as well as latency; the period between exposure and disease.

Other weaknesses are; 1) the use of mortality, a measure insensitive to cancer risk, when incidence data are required, 2) aggregating different types of cancers, rather than examining individual types, 3) not considering other sources of ionizing radiation, and 4) disregarding established risk factors and their attributable risks.

Appendix B

Contributors to the Supplement

Appendix B

Contributors to the Supplement

The overall responsibility for the preparation of this supplement was assigned to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC). The statement was prepared by members of the Office of Nuclear Reactor Regulation with assistance from other NRC organizations, and the Lawrence Livermore National Laboratory. Representatives from Argonne National Laboratory, Pacific Northwest National Laboratory, Energy Research Incorporated, and the Information Systems Laboratory also participated in this review.

Name	Affiliation	Function or Expertise
NUCLEAR REGULATORY COMMISSION		
Louis Wheeler	Nuclear Reactor Regulation	Project Manager
John Tappert	Nuclear Reactor Regulation	Section Chief
Barry Zalcman	Nuclear Reactor Regulation	Technical Monitor
James Wilson	Nuclear Reactor Regulation	Project Management
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Robert Palla	Nuclear Reactor Regulation	Severe Accident Mitigation Alternatives
Stacey Fox	Nuclear Reactor Regulation	Environmental Scientist
Jason Flemming	Nuclear Reactor Regulation	Project Management
Nina Barnett	Nuclear Reactor Regulation	Administrative Support
Richard Emch	Nuclear Reactor Regulation	Project Management
Gregory Suber	Nuclear Reactor Regulation	Project Management
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Rebecca Jones		Administrative Support
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Michael J. Scott		Socioeconomics, Alternatives
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Mohsen Khatib-Rahbar		Severe Accident Mitigation Alternatives
Michael Zavisca		Severe Accident Mitigation Alternatives

(a) Lawrence Livermore National Laboratory is operated for the U.S. Department of Energy by the University of California.
(b) Argonne National Laboratory is operated for the U.S. Department of Energy by the University of Chicago.
(c) Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute.

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Exelon Generation Company's Application for License Renewal of Peach Bottom Atomic Power Station, Units 2 and 3

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to Exelon Generation's Application for License Renewal of Peach Bottom Atomic Power Station, Units 2 and 3

This appendix contains a chronological listing of correspondence between the NRC and Exelon Generation Company (Exelon) and other correspondence related to the NRC staff's environmental review, under 10 CFR Part 51, of Exelon's application for renewal of the Peach Bottom Atomic Power Station, Units 2 and 3, operating licenses. All documents, with the exception of those containing proprietary information, have been placed in the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD, and are available electronically from the Public Electronic Reading Room found on the Internet at the following web address: http://www.nrc.gov/NRC/ADAMS/index.html. From this site, the public can gain access to the NRC's Agencywide Document Access and Management Systems (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records (PARS) component of ADAMS. The ADAMS accession numbers for each document are included below.

June 26, 2001	Letter from Mr. Robert S. McCord, Harford County Acting Director of Governmental and Community Relations, identifying Mr. James Mason, Public Information Manager, as the Harford County point of contact for NRC interests related to the Peach Bottom license renewal environmental review (Accession No. ML011360033).
July 2, 2001	Letter from Mr. Jeffrey A. Benjamin, Exelon, to the NRC, submitting the application for the renewal of the operating licenses for the Peach Bottom Atomic Power Station, Units 2 and 3 (Accession No. ML011840304).
July 18, 2001	NRC staff letter to Mr. James A. Hutton, Exelon, forwarding an information copy of a notice sent to the Office of the Federal Register regarding receipt and public availability of the Peach Bottom license renewal application. (The notice was published in the Federal Register on July 25, 2001, at 66 FR 38753.)
July 26, 2001	NRC News Release No. 01-092, "NRC Announces Availability of License Renewal Application for Peach Bottom Atomic Power Station" (Accession No. ML012130029).

August 20, 2001	NRC staff letter to Mr. George Meyn, Harford County Public Library, Whiteford, MD, regarding the maintenance of reference material for public access related to the Peach Bottom license renewal environmental review (Accession No. ML012330206).
August 20, 2001	NRC staff letter to Ms. Martha Gunder and Ms. Essy Day, Collinsville Community Library, Brogue, PA regarding the maintenance of reference material for public access related to the Peach Bottom license renewal environmental review (Accession No. ML012330179).
September 5, 2001	NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding an information copy of a Federal Register notice of acceptance for docketing of the application and notice of opportunity for hearing regarding the renewal of the Peach Bottom operating licenses, and the NRC schedule for the safety and environmental reviews of the license renewal application. (The Federal Register notice was published on August 31, 2001, at 66 FR 46036-46038). (Accession No. ML012490088).
September 17, 2001	NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding a Federal Register Notice of intent to prepare an environmental impact statement and conduct scoping. (The notice was published in the Federal Register on September 24, 2001, at 66 FR 48892-48893.) (Accession No. ML012600025).
October 11, 2001	NRC staff letter to Mr. John Wolflin, U.S. Fish and Wildlife Service, requesting information relevant to the NRC environmental review (Accession No. ML012850256).
October 16, 2001	NRC public meeting notice (memorandum with information for the NRC web site) of the November 7, 2001, public meetings in Delta, PA to facilitate public participation in the environmental review scoping process (Accession No. ML012890176).
October 24, 2001	NRC staff letter to Chief Roy Crazy Horse, Chairperson, New Jersey Commission on American Indian Affairs, inviting participation in the environmental review scoping process (Accession No. ML012970498).
October 26, 2001	NRC staff letter to Mr. Jim Rementer, Delaware Tribe of Indians, inviting participation in the environmental review scoping process (Accession No. ML012990489).

October 26, 2001	NRC News Release No. I-01-061, "NRC Seeks Public Input on Environmental Statement for Proposed Peach Bottom Nuclear Power Plant License Renewal," which provides information on the upcoming November 7, 2001, public meetings in Delta, PA; the public availability of the licensee's application; and the environmental review process (ML020170238).
October 26, 2001	Three emails from Ms. Faye Stocum, Delaware State Historical Preservation Office staff, forwarding 15 photographs of the area where the Keeney transmission line intersects a Chesapeake and Delaware feeder canal (ML020230253).
October 26, 2001	Letter from Faye L. Stocum, Delaware State Historic Preservation Office archaeologist to Paul McGuff, Lawrence Livermore National Laboratory, providing information on a concern regarding the extent and continued adverse effect of original construction and continued usage of the transmission line on an historic property (ML020310091).
October 26, 2001	NRC staff letter to Chief Billy Tayac, Piscataway Indian Nation, inviting participation in the environmental review scoping process (Accession No. ML013020430).
October 29, 2001	Letter from Daniel R. Griffith, Delaware State Historic Preservation Officer (SHPO) to the NRC regarding an historic property within the license renewal project area of potential effect (Chesapeake and Delaware Feeder Canal) (Accession No. ML013650064).
November 6, 2001	Email to Peach_Bottom_EIS@nrc.gov from Mr. George Crocker, Executive Director, North American Water Office, providing public input to the environmental review scoping process (Accession No. ML020110480).
November 7, 2001	Energy Justice Network document with public input to the environmental review scoping process - given to the NRC at a November 7, 2001, public scoping meeting (document was attached to the meeting transcript) (Accession No. ML020170483).
November 7, 2001	Letter from the County Commissioners of York County with input to the environmental review scoping process - given to the NRC at a November 7, 2001, public scoping meeting (letter was attached to the meeting transcript) (Accession No. ML020170484).

November 8, 2001 Letter from Hugh Jackson, Public Citizen's Critical Mass Energy and Environmental Program, to the Chief, Rules and Directives Branch, providing public input to the environmental review scoping process (provides same input as a November 7, 2001, email to Peach_Bottom_EIS@nrc.gov (Accession No. ML 020310088).

November 10, 2001 Email to Peach_Bottom_EIS@nrc.gov from Mr. Thomas H. Gehr providing public input to the environmental review scoping process (Accession No. ML020230264).

November 13, 2001 Email to Peach_Bottom_EIS@nrc.gov from Mr. Ken Zieber providing public input to the environmental review scoping process (Accession No. ML020230260).

November 19, 2001 Letter from the Fish and Wildlife Service, Chesapeake Bay Field Office, responding to the October 11, 2001, NRC staff request for information on threatened and endangered species in the Peach Bottom license renewal project area (with attached NRC staff Note to File) (ML020290308).

November 20, 2001 Delaware State Historic Preservation Office letter discussing the Section 106 regulations of the Advisory Council on Historic Preservation and providing a list of entities having an interest in historic preservation (ML020310082).

November 20, 2001 Telefax received from the Alliance For A Clean Environment providing public input to the environmental review scoping process (Accession No. ML020020383).

November 20, 2001 Letter from the York County Chamber of Commerce providing input to the environmental review scoping process (Accession Mo. ML013650052).

November 21, 2001 Email to Peach_Bottom_EIS@nrc.gov from Mr. Joseph Mangano, Radiation and Public Health Project, providing public input to the environmental review scoping process (Accession No. ML020230268).

November 26, 2001 NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding the October 29, 2001, letter from the Delaware SHPO to the NRC and requesting information related to the SHPO interests (Accession No. ML013300623).

November 26, 2001 Email to Peach_Bottom_EIS@nrc.gov from Mr. David P. Harry providing public input to the environmental review scoping process (Accession No. ML020310096).

November 26, 2001 Letter from Mr. Richard I. McLean, Maryland Department of Natural Resources, providing input to the environmental review scoping process (Accession No. ML020230262).

November 26, 2001 NRC staff letter to Ms. Katrina S. Anderson, Director, Quarryville Library, Quarryville, PA regarding the maintenance of reference material for public access related to the Peach Bottom license renewal environmental review (Accession No. ML013300616).

November 26, 2001 Letter from Amy Donohue to the Chief, NRC Rules and Directives Branch, providing public input to the environmental review scoping process (also provided by telefax on November 27, 2001) (Accession No. ML013460258).

December 3, 2001 NRC Press Release I-01-066, "3rd Library to Make Available Peach Bottom License Renewal Information," in response to public interest expressed during the November 7, 2001, public meetings to have documents made available at the Quarryville, PA library (ML020250330).

December 20, 2001 NRC staff letter to Exelon requesting additional information regarding Severe Accident Mitigation Alternatives (ML013540507).

January 14, 2002 Pennsylvania Department of Environmental Protection letter informing the NRC staff that the Peach Bottom facility is in compliance with its NPDES permit (ML020310086).

January 17, 2002 NRC staff request to the U.S. Fish and Wildlife Service, Pennsylvania Field Office, requesting concurrence in NRC staff conclusions pertaining to threatened and endangered species (ML020180445).

January 18, 2002 Summary of the public scoping meetings held in Delta, PA as part of the NRC staff environmental scoping process (ML020180346).

January 23, 2002 Letter from Exelon responding to the NRC staff letter dated November 26, 2001, requesting information related to the Chesapeake and Delaware feeder canal which crosses the Keeney transmission line (ML020600194).

January 30, 2002	Letter from Exelon responding to the December 20, 2001, NRC staff request for additional information regarding Severe Accident Mitigation Alternatives (ML020510139).
March 7, 2002	NRC staff letter to the Delaware SHPO responding to the SHPO letters of October 29 and November 20, 2001, which discuss a property of historic interest located along a transmission line corridor in Delaware (ML020660229).
April 17, 2002	Letter from U.S. Fish and Wildlife Service responding to the January 17, 2002, NRC staff request for concurrence in conclusions pertaining to threatened and endangered species (ML021510200).
April 19, 2002	NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding the Peach Bottom License Renewal Environmental Scoping Summery Report (ML021120382).
May 30, 2002	NRC staff Note to File with information enclosed for the docket files and public availability which was provided to the staff by the licensee, Conectiv Power Delivery, and the U.S. Fish and Wildlife Service (ML021510206).
June 24, 2002	NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding a copy of the notice sent to the Federal Register for publication regarding the availability of the Peach Bottom Draft Supplemental Environmental Impact Statement (DSEIS) for review and public comment (ML021750129)
June 24, 2002	NRC staff letter to Mr. Michael P. Gallagher, Exelon, forwarding a copy of the Peach Bottom DSEIS for review and comment (ML021750183).
July 5, 2002	Email to Peach_Bottom_EIS@nrc.gov from Shirley A. Liebman providing comments on the DSEIS (ML022060545).
July 8, 2002	NRC staff letter to Mr. Michael P. Gallagher, Exelon, correcting the date for the end of the public comment period specified in the June 24, 2002, letter (ML021900079).
July 8, 2002	NRC Meeting Notice regarding the public meeting on July 31, 2002, in Delta, PA. (ML021900031).

July 13, 2002	Email to Peach_Bottom_EIS@nrc.gov from Shirley A. Liebman, providing comments on the DSEIS and requesting an opportunity to speak at the DSEIS public comment meeting (ML022060514).
July 27, 2002	Email to Peach_Bottom_EIS@nrc.gov from Shirley A. Liebman forwarding comments prepared for the July 31, 2002, public meeting (ML022130325).
July 29, 2002	Email to Peach_Bottom_EIS@nrc.gov from Shirley A. Liebman forwarding final written comments and background information for the 7:00 p.m. public meeting on July 31, 2002 (ML022130328).
August 1, 2002	Email from Joe Mangano, Radiation and Public Health Project, to Patricia Milligan, NRC staff, forwarding supporting information for his presentation at the July 31, 2002, public meeting (ML022210147).
August 8, 2002	Anonymous letter to the NRC Rules and Directives Branch (unsigned, undated, no return address, post marked August 8, 2002) providing general comments in opposition to the continued operation of Peach Bottom Atomic Power Station (ML022270363).
August 19, 2002	Summary of the July 31, 2002, public meeting in Delta, PA to receive public comments on the DSEIS (ML022310317).
August 27, 2002	Letter from Exelon providing comments on the DSEIS (ML022560046).
September 9, 2002	Letter from the Delaware State Historic Preservation Officer providing comments related to the National Historic Preservation Act as it applies to NRC consideration of the portion of the Keeney transmission line which lies in Delaware (ML022700286).
September 13, 2002	Letter from the United States Department of the Interior providing comments on the DSEIS (ML022680545).
September 13, 2002	Letter from the Maryland Department of Natural Resources providing comments on the DSEIS (ML022750079).
September 17, 2002	Letter from the United States Environmental Protection Agency, Region lll, providing comments on the DSEIS (ML022630453).

September 27, 2002	Letter to NRC environmental consultant at Pacific Northwest National Laboratory from Normandeau Associates, Inc. which describes observations from fish sampling in Conowingo Pond (ML022750082).
November 12, 2002	Letter from the Pennsylvania Department of Health providing an evaluation of information submitted to the NRC staff by the Radiation and Public Health Project (ML023250318).
December 16, 2002	Email from Exelon to the NRC staff forwarding the "Interconnection Agreement By and Among PECO Energy Company And Exelon Generation Company, L.L.C. [and] PSEG Nuclear, LLC For The Peach Bottom Atomic Power Station," dated January 12, 2001 (ML023530119).
January 9, 2003	NRC staff letter to the Delaware State Historic Preservation Officer (DE SHPO) replying to the DE SHPO letter of September 9, 2002 (ML030090187).
January 9, 2003	NRC staff Letter to Conectiv Power Delivery forwarding a copy of the DE SHPO letter dated September 9, 2002, and the NRC staff reply dated January 9, 2003 (ML030090261).

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

During the course of the staff's independent review of environmental impacts from operations during the renewal term, the following Federal, State, regional, and local agencies were contacted:

Administrator, Treasurer, York County

Assistant Superintendent, South East District Schools

Convention & Visitors Bureau, York County

Delaware Department of Natural Resources and Environmental Control

Delaware Natural Heritage Program

Delaware State Historic Preservation Office

Fish, Wildlife and Marine Resources, New York Division

Gifford Pinchot State Park (GPSP Administers Susquehannock State Park)

Lancaster County Assessment Office

Lancaster County Community Action Program

Lancaster County Planning and Zoning

Lancaster County Planning Commission

Lancaster Parks and Recreation Department

Maryland Department of Housing and Community Development, Division of Historical and Cultural Programs

Maryland Department of Natural Resources

National Marine Fisheries Service

National Renewable Energy Laboratory

Appendix D

Natural Resources Conservation Service, New Castle County, Delaware

Parks and Recreation, York County

Peach Bottom Township

Pennsylvania Association of Visitor and Convention Bureaus

Pennsylvania Department of Environmental Protection

Pennsylvania Department of Health

Pennsylvania Fish and Boat Commission

Pennsylvania Game Commission

Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation

Realty Advisor, Stewartstown, Pennsylvania

Realty Advisor, York, Pennsylvania

Solanco School District

Susquehanna River Basin Commission

Treasurer, Lancaster County

United Way of Lancaster County

US Fish and Wildlife Service - Chesapeake Bay Field Office

US Fish and Wildlife Service - Pennsylvania Field Office

York County Planning Commission

Appendix E

Exelon Generation Company's
Compliance Status and Consultation Correspondence

Appendix E

Exelon Generation Company's Compliance Status and Consultation Correspondence

The list of licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for Peach Bottom Units 2 and 3 is shown Table E-1. Following Table E-1 are reproductions of consultation correspondence prepared and sent during the evaluation process of the application for renewal of the operating licenses for Peach Bottom Units 2 and 3.

Table E-1. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for Current Peach Bottom Units 2 and 3 Operation

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NRC	10 CFR Part 50	Operating license, Peach Bottom Unit 2	DPR-44 (Unit 2)		August 8, 2013 (Unit 2)	Authorizes operation of Unit 2
NRC	10 CFR Part 50	Operating license, Peach Bottom Unit 3	DRP-56 (Unit 3)		July 2, 2014 (Unit 3)	Authorizes operation of Unit 3
FWS	Section 7 of the Endangered Species Act (16 USC 1536)	Consultation	NA	November 19, 2001		Requires a Federal agency to consult with FWS regarding whether a proposed action will affect endangered or threatened species
NMFS	Section 7 of the Endangered Species Act (16 USC 1536)	Consultation	NA	November 19, 2001		Operation during the renewal term
SRBC	Susquehanna Basin Compact (18 CFR 803)	Approval	Docket 19830506	May 12, 1985, no expiration date		Consumptive Use of Conowingo Pond water
PDEP	Storage Tank and Spill Prevention Act 32	Registration	187882	Issued annually		Storage tanks (gasoline, used oil, hazardous substances, unlisted materials)
PHMC	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation		Letter from PHMC to PECO, December 14, 2000		The National Historic Preservation Act requires Federal agencies to take into account the effect of any undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.
MDE	Section 307 of the Coastal Zone Management Act [16 USC 1456(c)(3)(A)]	Consistency determination	NA	Letter from MDE dated April 23, 2002		Consistency of license renewal with the Maryland Coastal Management.

Table E-1. (contd)

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
PDEP	Pennsylvania Clean Stream Law, as amended, 35 P.S. Section 691.1 et seq.	National Pollution Discharge Elimination System Permit and Section 401 certification			December 1, 2005	Permit for discharge of waste waters from cooling water, waste water settling basin, auxiliary boiler blowdown, sewage treatment plant, dredging rehandling basin, raw intake screen backwash water; and storm water outfall
PDEP	Pennsylvania Dam Safety and Encroachment Act (32 P.S. Section 693.1 et seq.), Clean Stream Law (35 P.S. Section 691.1 et seq.), Flood plain Management Act (32 P.S. Section 679.101 et seq.)	Permit	E36-693		December 31, 2010	Maintenance dredging of intake area
PDEP	Pennsylvania Safe Drinking Water Act	Permit	6791502	March 21, 1994, no expiration date		Public Water Supply permit
PDEP	Air Pollution Control Act P25 Pa. Code Chapter 127)	Air emissions permit	67-05020		February 29, 2004	Emissions from diesel emergency generators, miscellaneous diesel engines, and other miscellaneous units
DSHPO	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation	NA	Letter from DSHPO to NRC dated October 29, 2001		Impact on sites listed or eligible for listing in the National Register of Historic Places
DSHPO	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation	NA	Letter to NRC from DSHPO dated September 9, 2002		Identifies need for consultation
MHT	Section 106 of the National Historic Preservation Act (16 USC 470f)	Consultation	NA	Letter MHT to Exelon, September 22, 2000		Impact on sites listed or eligible for listing in the National Register of Historic Places

Table E-1. (contd)

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
PDER	Clean Water Act (33 USC Section 1251 et seq.), Pennsylvania Clean Streams Law (35 P.S. Section 691.1 et seq.)	Individual Discharge Permit	PA 0009733	November 3, 2000	December 1, 2005	Contains effluent limits for Peach Bottom Units 2 and 3 discharges to the Susquehanna River.
EPA and PDEP	Clean Water Act Section 401 (33 USC 1341)	Certification of compliance with state water quality standards	NPDES permit constitutes compliance			Discharges during license renewal term

DSHPO - Delaware State Historic Preservation Officer
EPA - U.S. Environmental Protection Agency
FWPCA - Federal Water Pollution Control Act (also known as the Clean Water Act)
FWS - U.S. Fish and Wildlife Service
MDE – Maryland Department of the Environment
MHT - Maryland Historical Trust
NMFS - National Marine Fisheries Service
NPDES - National Pollutant Discharge Elimination System
NA - Not applicable
PDEP - Pennsylvania Department of Environmental Protection
PDER – Pennsylvania Department of Environmental Resources
PECO – PECO Energy
PHMC - Pennsylvania Historical and Museum Commission
SRBC – Susquehanna River Basin Commission

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 17, 2002

Ms. Bonnie Crosby
U.S. Fish and Wildlife Service
Pennsylvania Field Office
315 South Allen St., Suite 322
State College, PA 16801-4850

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3, LICENSE RENEWAL - "NO EFFECT" AND "NOT LIKELY TO ADVERSELY AFFECT" DETERMINATIONS FOR THREATENED AND ENDANGERED SPECIES

Dear Ms. Crosby:

This is a request for your concurrence with conclusions which have been developed during the preparation of an environmental impact statement. The conclusions pertain to threatened and endangered species in the project area for the proposed license renewal of the Peach Bottom Atomic Power Station (PBAPS).

The U.S. Nuclear Regulatory Commission (NRC) is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed license renewal of the operating licenses for (PBAPS) Units 2 and 3, located in Peach Bottom Township, southeastern York County, PA. The current PBAPS licenses will expire in 2013 and 2014 for Units 2 and 3, respectively. The proposed license renewal would extend these operating licenses to 2033 and 2034. One factor considered within this SEIS is the potential for adverse impacts to federally listed endangered or threatened species that may result from continued operation of the facility for up to 20 additional years.

The PBAPS facility includes two boiling water reactors, a control building, a turbine building, and several other structures and facilities, including cooling water intake and discharge structures. The facilities are located on the west bank of the Susquehanna River, approximately 2 miles north of the Maryland/Pennsylvania border. The site is located approximately 8 miles upstream from Conowingo Dam and 6 miles downstream from Holtwood Dam. One transmission corridor is included in the analysis for the PBAPS SEIS. This 54 km (34 mile), 500kV transmission line crosses the Susquehanna River at the PBAPS site, enters Maryland near the village of Rock Springs, then traverses Cecil County, MD, and ends at the Keeney substation in northern Delaware, approximately 5 miles south of Newark, DE.

The licensee for PBAPS, Exelon Generation Company (Exelon), formerly PECO Energy Company (PECO), contacted the USFWS Pennsylvania Field Office concerning threatened and endangered species through a letter dated October 11, 2000, (PECO 2000). The Pennsylvania Field Office provided a response to PECO on October 18, 2000, (USFWS 2000a). The NRC staff contacted the USFWS Chesapeake Bay Field Office on October 11, 2001(NRC 2001), and received a response dated November 19, 2001 (USFWS 2001). We have reviewed these letters, additional information provided by PECO, and information obtained through discussions with State wildlife biologists in Pennsylvania, Maryland and Delaware.

Federally listed species potentially affected by the PBAPS license renewal include the American bald eagle (Haliaeetus leucocephalus) and the bog turtle (*Clemmys muhlenbergii*). An additional species, the swamp pink (*Helonias bullata*) has also been reported from the vicinity of the project area. It is our understanding that one additional species, the Delmarva peninsula fox squirrel (*Sciurus niger cinereus*) may occur as experimental populations in Cecil County, MD and New Castle County, DE, but no natural populations are known from those counties (USFWS 1993) and it will therefore not be considered further.

The bald eagle is known to occur in York and Lancaster Counties, PA, Cecil County, MD, and New Castle County, DE. The Lower Susquehanna River is one of the most important areas for bald eagles in Pennsylvania. There are approximately 10 known nests on Conowingo Pond, 6 on the Maryland side of the border and 4 on the Pennsylvania side. The nests within Pennsylvania are all upstream of the PBAPS site, with the nearest located on Lower Bear Island, approximately 5 km (3 miles) upstream from the PBAPS site (Daniel Brauning, PA Department of Wildlife, personal communication, November 2001). The locations of the nests within Maryland were not precisely indicated, but the nearest nest would be at least 2 miles downstream from the PBAPS site (David Brinker, Maryland Department of Natural Resources, personal communication, November 2001).

The lower Susquehanna River is also a very important wintering area for bald eagles. In Maryland, there are usually between 25 and 30 eagles that winter in the vicinity of Conowingo Dam (David Brinker, personal communication), while in Pennsylvania there are usually between 10 and 20 wintering eagles on Conowingo pond (Brauning and Peebles 2001). In especially cold periods, as many as 15 to 20 eagles have been reported to congregate near the PBAPS discharge canal because it may be the only non-frozen portion of the river (Daniel Brauning, personal communication, corroborated by PECO Energy personnel).

The presence of the PBAPS does not appear to adversely affect the local bald eagle population, and there are indications that the nesting eagle population on the lower Susquehanna may be approaching saturation (PGC 2001). The PBAPS facility has been operating at this location since the early to mid 1970's. Since that time the eagle population has increased dramatically in the vicinity of Conowingo Pond, as it has throughout Pennsylvania. The NRC staff therefore concludes that continued operation of the PBAPS facility for an additional 20 years beyond the current license terms is not likely to adversely affect bald eagles. During especially cold periods, the operation of the plants may have a beneficial effect, because the warm discharge water may be the only available foraging area.

Bog turtles are known to occur in York and Lancaster Counties, PA, Cecil County, MD, and in New Castle County, DE (USFWS 1997). There is no suitable habitat at the PBAPS site itself. However, the Peach Bottom-to-Keeney transmission corridor traverses several streams and wetlands. PECO commissioned a "Phase 1" bog turtle habitat survey (Tetra Tech 2000) along the entire length of the transmission corridor following procedures described in USFWS 2000b. Four of the five stream crossings identified during the survey were incised channels through upland habitats, with no adjacent wetlands present. These channels are rocky, with no muck substrate. Therefore, these areas lack the criteria (hydrology, substrate, and vegetation) identified by USFWS 2000b for suitable bog turtle habitat. The fifth site supports a small wetland (< 0.04 ha [0.1 acre]) with at least one low area of mucky soil and a few wetland plants such as jewelweed (*Impatiens* sp.), skunk cabbage (*Symplocarpus foeditus*), and rushes

(*Juncus* sp.). However, most of the area is covered by a dense stand of mile-a-minute weed (*Polygonum perfoliatum*). Additionally, the hydrology of the site does not meet bog turtle habitat criteria. The marsh does not appear to be spring fed, but is instead a depressional area with no evidence of shallow rivulets or other features described in USFWS 2000b. Therefore, it is concluded that there is no suitable bog turtle habitat within the Keeney transmission corridor. Based on the results of this survey, the NRC staff concludes that continued operation of PBAPS for an additional 20 years will have no effect on bog turtles.

The swamp pink is a perennial, rhizomatous member of the lily family (Liliaceae). New Jersey supports the greatest number of populations, but populations also are found in Delaware, Maryland, and further south in Virginia, North and South Carolina, and Georgia (USFWS 1991). In Maryland, all known populations appear to occur within freshwater seepage areas along streams (USFWS 1991). All the known populations within Cecil County occur along the fall line between the coastal plain and piedmont ecological regions (David Brinker, personal communication) which lie several miles south of the Peach Bottom-to-Keeney transmission line. All the transmission line corridors within Cecil County have been surveyed on several occasions by the Maryland Department of Natural Resources. These surveys identified two locations along the Keeney line with rare or unusual plant species (the Richardsmere and Rock Springs Natural Areas), but did not identify any occurrences of the swamp pink within the Keeney transmission corridor (MDNR 1998). In Delaware, the swamp pink is known from southwestern New Castle County, but not from the project area in the northwestern part of the county (Bill McAvoy, Delaware Natural Heritage Program, personal communication). Therefore, the NRC staff concludes that the continued operation of PBAPS for an additional 20 year license term will have no effect on the swamp pink.

Based on these considerations, the NRC staff has concluded that renewal of the PBAPS operating licenses for an additional 20 years beyond the current license terms will have either no effect (swamp pink and bog turtle) or is not likely to adversely affect (bald eagle) listed species in the vicinity of the PBAPS site or the associated transmission corridor. The NRC staff requests your written concurrence with these conclusions, if appropriate, for inclusion in the SEIS currently under preparation.

Thank you for your consideration of this request. If there are any questions, please contact me by telephone at (301) 415-1444 or by email at dxw@nrc.gov.

Sincerely,
Original Signed By: LLWheeler
Louis L. Wheeler, Sr. Environmental Project Mgr.
Environmental Section
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: List of References

References

Brauning, D.W. and B. Peebles 2001. Bald Eagle Research and Management, Bald Eagle Breeding and Wintering Surveys. Project Annual Job Report. Pennsylvania Game Commission, March, 2001.

Maryland Department of Natural Resources, 1998. Ecologically significant areas in Cecil County. Sites newly identified or updated in 1998. Report to the Coastal Zone Management Division, Maryland, Department of Natural Resources, December 1998.

PECO Energy Company, 2000. Peach Bottom Atomic Power Station, Units 2 and 3 Licnese Renewal: Request for information on threatened and endangered species. Letter from Mr. James A. Hutton, PECO, to Mr. Michael McCarthy, USFWS, October 11, 2000.

Pennsylvania Game Commission. 2001. "Bald Eagles Continue Their Impressive Comeback." Pennsylvania Game Commission News Release #48-01, June 26, 2001.

Tetra Tech NUS, Inc. 2000. Bog Turtle Habitat Survey along the Keeney Transmission Corridor. Prepared for PECO Energy Company, Kennett Square, PA.

U.S. Fish and Wildlife Service, 1991. Swamp Pink (*Helonias bullata*) Recovery Plan. Newton Corner, MA, 56 pp.

U.S. Fish and Wildlife Service, 1993. Delmarva Fox Squirrel (*Sciurus niger cinereus*) Recovery Pla, Second Revision. Hadley, MA, 104 pp.

U.S. Fish and Wildlife Service, 1997. "Endangered and Threatened Wildlife and Plants; Final Rule" to list the northern population of the bog turtle as threatened and the southern population at threatened due to similarity of appearance. Federal Register Vol. 62, No. 213, November 4, 1997.

U.S. Fish and Wildlife Service. 2000a. Letter from Mr. David Densmore, USFWS to Mr. James Hutton, PECO Energy, October 18, 2000.

U.S. Fish and Wildlife Service, 2000b. Guidelines for Bog Turtle Surveys. Pennsylvania Filed Office, State College, PA., August 30, 2000, Revision.

NRC, 2001. Letter to Mr. John Wolflin, U.S. Fish and Wildlife Service requesting information on endangered or threatened spreies in the Peach Bottom license renewal project area, October 11, 2001.

U.S. Fish and Wildlife Service, 2001. Letter to Ms. Cynthia A. Carpenter, NRC, responding to October 11, 2001, request for information on the presence of endangered or threatened species in the Peach Bottom license renewal project area, November 19, 2001.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

April 17, 2002

Duke Wheeler
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dear Mr. Wheeler:

This responds to your letter of March 13, 2002, requesting our review of the Peach Bottom Atomic Power Station, Units 2 and 3, license renewal - "No Effect" and "Not Likely to Adversely Affect" determinations, located in York County, Pennsylvania. The Power Station is located within the range of two federally listed species, the threatened bald eagle (*Haliaeetus leucocephalus*) and bog turtle (*Clemmys muhlenbergii*). The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

Bald Eagle

Bald eagles typically occur in the vicinity of aquatic ecosystems; they frequent lakes, reservoirs, large rivers (e.g., Delaware River, Juniata River, Susquehanna River), and wetland systems. Their nests are usually built in large trees within two miles of these features. Because eagles are vulnerable to human disturbance, particularly during the nesting season, nests are often located in relatively remote forested areas.

The Fish and Wildlife Service proposed to remove the bald eagle from the federal *List of Endangered and Threatened Wildlife* on July 6, 1999 (*Federal Register*, Vol. 64, No. 128), but final action on that proposal has not been taken. The bald eagle, therefore, continues to be listed under the Endangered Species Act. Any changes in the regulatory status of the bald eagle can be monitored by accessing the Service's web site (www.fws.gov).

The bald eagle population in Pennsylvania has increased substantially from the three nest sites found in the State from 1963 through 1980. In 2001, 53 eagle nests were documented. Because bald eagles are continuing to recover and expand their breeding range in Pennsylvania, new eagle nests may be found in previously undocumented locations.

The Pennsylvania Game Commission has determined that the project is in the vicinity of 10 eagle nests on the Lower Susquehanna. In Pennsylvania, the closest nest site is located three miles upstream. Downstream of the project (Maryland), the closest eagle nest is approximately two miles away. Because of the distance between the project and the known eagle nests, continued

operation of the power plant is not likely to adversely affect the bald eagle.

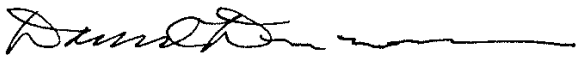
Bog Turtle

A Phase I Bog Turtle Habitat Survey was conducted by Tetra Tech in 2000. According to the report, no wetlands are located at the power plant site. However, the transmission corridor traverses several streams and wetlands. Four of the five streams were incised channels with rocky substrates. The fifth stream crossing had a small, adjacent wetland. However, hydrology adequate to support bog turtles is not present in this wetland. Therefore, based on our review of this information, we conclude that the proposed project will have no permanent or temporary impacts on palustrine wetland habitat that could be occupied by bog turtles.

If this project is implemented as proposed, we concur that renewal of the license of the Peach Bottom Power Station will not effect the bog turtle or its habitat, and is not likely to adversely affect the bald eagle. This response relates only to endangered or threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

If we can be of further assistance, please contact Bonnie Dershem of my staff at 814-234-4090.

Sincerely,



David Densmore
Supervisor

STATE OF DELAWARE
DEPARTMENT OF STATE
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS
HISTORIC PRESERVATION OFFICE
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50-277/278

September 9, 2002

Mr. Louis L. Wheeler
Senior Project Manager
License Renewal and Environmental Impacts Program
Division of Regulatory Improvements Programs
Office of Nuclear Reactor Regulations
Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Wheeler:

We received your March 7 letter regarding the Nuclear Regulatory Commission's (NRC) opinion that for compliance with Section 106 of the National Historic Preservation Act, the presence of any historic property along the Keeney Transmission Line are beyond the area of potential effects. We believe this opinion to be inconsistent with the Advisory Council on Historic Preservation's (Council) regulations and with information provided to this Office during the initiation Section 106consultation for the proposed relicensing of the Peach Bottom Atomic Power Station (PBAPS). In a July 5, 2000 letter sent to Ms. Joan Larrivee, of my staff, from James Hutton, Director of Licensing for PECO Nuclear, Mr. Hutton identified the original undertaking included authorizing the construction in 1974 of the Keeney Transmission Line as the "Only one new transmission corridor [which] was required to integrate PBAPS into PECO Energy's bulk power system when the facility was constructed. This line, from Peach Bottom to the Keeney Substation in Delaware, is the only transmission line/corridor under review during this [current]license renewal process." In this letter initiating consultation with this Office, Mr. Hudson effectively identified reauthorizing of the Keeney Transmission line as an element of the licensing renewal, the undertaking, and as part of the Area of Potential Effect, as per the Council's definition of an *undertaking* (36 CFR 800.16(y)) and the project *Area of Potential Effecst* (36 CFR 800.16(d)). Especially important to the definition of undertaking is the notion that it includes "the geographical area or areas within which a undertaking *may directly or indirectly* (my emphasis) cause alterations in the character or use of historic properties, if such properties exist." It is important to note here, there is no discussion of ownership or control which limits the consideration of whether to include any location or property therein within the boundary of the APE. Such limitations would

Add: Duke
Wheeler IE25

hamper the ability to adequately identify and consider to the fullest extent, what types and degrees of impact or effect an undertaking would have on historic properties for any type of undertaking at any possible location. The Council does not set such restrictions on determining a project undertaking and its APE. The reauthorization of the Keeney Transmission Line, as part of this project, even though it is not owned or controlled by the licensee is not pertinent to the identification of historic properties and the evaluation of effects which the undertaking may have on those historic properties which are present within the APE. (See the attached information provided by Laura Dean of the Council as it pertains to determining an undertaking's area of potential effect: Points to remember Item #2; and, Colorado River Indian tribes v. Marsh, 605F. Supp.1425 (C.D. Cal. 1985.) Additionally, in the *Lower Delaware Valley Transmission System Agreement, Schedule 3, Revision No.1*, Page 1 of 2, which you included as an attachment to your March 7 letter, there was an agreement for DP & L (now Conectiv) to construct the Delaware section of the Keeney Transmission Line. Essentially, even while the licensee did not construct this line, it was clearly a contractual arrangement to provide the licensee with the facilities to convey power to its bulk power system, as referenced in Hutton's July 2000 letter. It is part of the undertaking and should be included in the project APE.

The identification of the Chesapeake and Delaware Feeder Canal (Feeder Canal), as an historic property within the project APE, was made by my staff during the consultation process. Comments were provided in an attachment to your March 7 letter, prepared by the licensee, as to their opinion on the non-eligibility of this property. It is important to remember that if there are disagreements between the federal agency and the SHPO as to the eligibility of a particular property, it is the federal agency's responsibility, using 36 CFR Part 61 qualified professionals, to seek a formal determination of eligibility from the Secretary of the Interior, pursuant to 36 CFR 800.4(c)(2) of the Council's regulations. To our knowledge this has not been done.

Finally, it is our contention the Feeder Canal, which we believe may be eligible for listing in the National Register of Historic Places, has been and is continuing to be subjected to destruction due to the lack of adequate maintenance of the transmission line. A bridge which was clearly present in the 1950-1960s which crossed the Feeder Canal was either removed or left to deteriorate. Sometime in the 1970's, the canal was filled in crusher run rock to provide access along this transmission line and to specifically cross this body of water. This in filling has resulted in the loss of the physical features of the Feeder Canal where it is crossed by the transmission line and the subsequent blocking of the flow of water within the Canal. It is our opinion, the lack of maintenance and/or retention of a bridge which spanned the canal and the lack of security to prevent unauthorized use of the access road or any other area along the banks of the Feeder Canal within the transmission right-of-way has caused significant deterioration and alteration of the

character of this property and therefore constitutes adverse effects due to destruction and neglect under 36 CFR 800.5(b)(2)(i) and (vi) of the Council's regulations. Towards trying to reverse or correct these adverse effects and to prevent further deterioration, the recommendations made in my October 29 , 2001 letter were presented.

By copy of this letter, we are requesting the Advisory Council to participate in the consultation process and provide guidance on expediting the review for this undertaking, pursuant to Appendix C, Criteria 2 of their regulations. We believe there has been an inconsistent application of their regulations during the Section 106 consultation for the relicensing of the PBAPS and the Keeney Transmission Line.

If you have any questions or desire to discuss this matter further, please contact Faye Stocum at the address above. Thank you.

Sincerely,

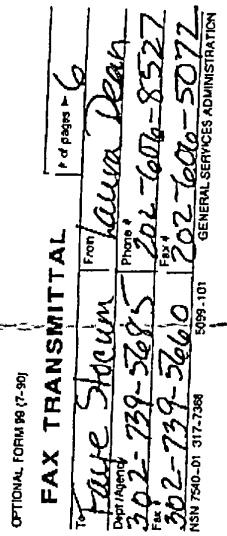
Daniel R. Griffith
State Historic Preservation Officer

Enclosures

cc: Don Klima, ACHP
Faye Stocum

Jun-14-02 10:46A P.01

ibility and inclusion



If a property meets the criteria for inclusion in the National Register, this doesn't automatically result in its being listed. To be listed, a property must be formally nominated using NPS forms and following NPS procedures. Agencies are not required to nominate properties in order to comply with Section 106, although Section 110(a)(2) of NHPA does require agencies to have programs in place for nominating federally owned or controlled historic properties.

If an owner of private property objects to including his or her eligible property in the National Register, they may block it from being listed. Effects on such a property are not exempt from Section 106 review, however, since the property remains eligible for the Register. Private owners may do as they wish with their historic property, provided that they are not receiving Federal assistance or approvals. If they are, the Federal agency involved must comply with Section 106 before the project can be implemented.

Identifying historic properties

Agencies are required to make a "reasonable and good faith effort to carry out appropriate identification efforts. . . " [36 CFR § 800.4(b)(1)] This responsibility rests squarely with the Federal agency and cannot be delegated (with the exception of certain HUD programs). The agency can solicit the help of applicants, grantees, or others to carry out this work, but it is up to the agency to see that the work is carried out properly and to make appropriate use of the results.

In consultation with the SHPO/THPO, the agency determines the scope of needed identification efforts and takes action to identify potential historic properties. The agency then evaluates the significance of those properties and decides whether any could be affected by the undertaking.

Determining an undertaking's area of potential effects

The agency's first step in establishing the scope of needed identification efforts is to determine the undertaking's area of potential effects. This is done in consultation with the

SHPO/THPO. [36 CFR §800.4(a)(1)] The area of potential effects (APE) is defined as:

> *. . . the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.* [36 CFR § 800.16(d)]

If there is disagreement concerning the extent of the APE, the consulting parties may seek guidance and assistance from the Council. Also, the Council can elect to issue an advisory comment to the agency on its APE determination. [36 CFR § 800.9(a)] If this occurs, the agency has to consider the views of the Council in reaching a final decision regarding the boundaries of the APE.

Points to remember. When defining an area of potential effects (APE), agencies need to remember that:

1. The APE is defined before identification begins, when it may not yet be known whether any historic properties actually are within the APE. To determine an APE, it is not necessary to know whether any historic properties exist in the area.

2. An APE is not determined on the basis of land ownership.

3. The APE should include:

- all alternative locations for all elements of the undertaking;
- all locations where the undertaking may result in disturbance of the ground;
- all locations from which elements of the undertaking (e.g., structures or land disturbance) may be visible or audible;
- all locations where the activity may result in changes in traffic patterns, land use, public access, etc.; and

project. The Corps prepared the plan and obtained the Council's concurrence in the plan in 1983.

The court rejected plaintiffs' claim that the Corps had not complied with the provision of the MOA that required a treatment plan. First, the court determined that Section 800.6(c)(3) of the Council's regulations, which states that a ratified MOA shall evidence satisfaction of the Federal agency's responsibility under Section 106 of NHPA, creates a "presumption of compliance." 567 F. Supp. at 989-90. Even without this presumption, the court held that the Government's documents demonstrated compliance with the terms of the MOA. *Id.* at 990.

The court dismissed plaintiffs' NHPA claims and held that further action withholding possession of the condemned lands on these grounds would not be warranted. *Id.* The Fifth Circuit affirmed. 733 F.2d at 380.

The district court also found that the Corps' programmatic environmental impact statement (EIS) prepared under the National Environmental Policy Act on the entire waterway project sufficiently addressed the impacts of the project on cultural resources. No site-specific EIS for Cedar Oaks and Barton township was needed. 567 F. Supp. at 991. The appellate court affirmed. 733 F.2d at 381.

87

***Colorado River Indian Tribes v. Marsh*, 605 F. Supp. 1425 (C.D. Cal. 1985).**

Plaintiffs, Indian tribes and an environmental organization, sought to enjoin the U.S. Army Corps of Engineers from issuing a permit to a developer for the placement of riprap along the western shore of the Colorado River in California. The purpose of the riprap was to stabilize the riverbank and establish a permanent boundary line for private property that the developer proposed to subdivide and develop into a residential and commercial community. The site of the development, known as the River City project, was directly across the river from the Colorado River Indian Reservation and directly south of additional portions of the reservation lying on the west side of the river. The land abutting the development site on the west was owned by the United States and administered by the Bureau of Land Management (BLM) of the Department of the Interior. The BLM land, an archeological district, included several significant cultural and archeological sites.

The developer applied to the Corps for the riprap permit in April 1978. The following fall, the Corps prepared an environmental assessment under the National Environmental Policy Act (NEPA) and concluded that, because significant impact upon the environment would result from the developer's proposed project, an environmental impact statement (EIS) should be prepared. The draft EIS was prepared and published in September 1979. In January 1981, the Corps informed the developer that a thorough cultural resources survey of resources on and near the proposed development site was needed before the Corps could complete the final EIS.

In June 1981, however, before the survey was begun, the Corps retracted the draft EIS as a result of changes in Corps policy regarding its jurisdictional authority and announced that no EIS and no further cultural resource evaluation were required. The Corps' decision to retract the draft EIS was apparently made in conformity with its proposed cultural resource regulations published in 1980, regulations that had never been adopted in final form or incorporated into the Code of Federal Regulations.

Under the proposed regulations, the Corps was required to assess both direct and indirect effects of its permits on properties listed or officially determined eligible for listing in the National Register of Historic Places. This review requirement extended beyond the area in which the permit would have direct physical effects to the "affected area," that area within which direct and indirect effects could be reasonably expected to occur.

For properties that were not listed or officially determined eligible for listing in the Register, but that might be eligible for the Register, the proposed regulations limited the Corps' review to the area within the Corps' jurisdiction—the "permit area," defined as that area which would be physically affected by the proposed work.

The Corps issued the riprap permit to the developer on May 21, 1982. Plaintiffs then filed this action, alleging that the Corps failed to comply with NEPA and the National Historic Preservation Act (NHPA).

After discussing the factors that must be present for a preliminary injunction to be granted, the court addressed the likelihood of plaintiffs' success on the merits of their case. Defendants first contended that no EIS was necessary under NEPA because Federal involvement in the River City project was minimal and "major Federal action" was therefore lacking. The court disagreed, finding that NEPA requires assessment of both direct and indirect effects of a proposed Federal action on both "on site" and "off site" locations. 605 F. Supp. At 1433. That there was minimal Federal involvement in the project did not excuse defendants from compliance with NEPA, for "it is not the degree of Federal involvement that influences the standard of living of our society, but is instead the potential and degree of impact from development that bears upon the overall welfare and enjoyment of our society." *Id.* at 1432. "Major Federal action" does not have a meaning under NEPA independent of "significantly affecting the quality of the human environment." *Id.* at 1431.

The Corps' limitation of the scope of its environmental assessment of the bank stabilization activities and its resulting conclusion that there would be no impact on cultural resources were improper and contrary to the mandate of NEPA. *Id.* at 1433.

The court next addressed plaintiff's claim that the Corps had violated NHPA by distinguishing between properties actually listed in or determined eligible for the National Register and properties that might be eligible for the Register and by affixing different historic review responsibilities to each. The court held that this distinction between properties and different scopes of responsibility was at odds with NHPA and the regulations of the Advisory Council on Historic Preservation implementing Section 106 of NHPA. *Id.* at 1438. Using the Council's definition of "eligible property" in Section 800.2 of its regulations as encompassing all properties that meet the criteria for inclusion in the Register, the court concluded that, in enacting NHPA, Congress intended to protect all properties that are of inherent historic and cultural significance and not just those that have been "officially recognized" by the Secretary of the Interior. *Id.* The court cited Executive Order No. 11593 and Section 110(a) of NHPA as support, finding that Federal agencies must exercise caution to ensure the physical integrity of those properties that appear to qualify for inclusion in the National Register. *Id.* at 1435.

The Corps' action in assessing the effects on properties that might qualify for inclusion in the National Register solely within the "permit area" and its failure to survey and consider the effects on like properties in the broader "affected area" was a breach of its responsibilities under NHPA. *Id.* at 1438.

Finally, the Court granted a preliminary injunction, finding that irreparable harm to cultural and archeological resources as a result of the development was possible. *Id.* at 1434-39.

88

***Sierra Club v. Watt*, No. CV-83-5878 AWT (C.D. Cal. Nov. 18, 1983), *aff'd sub nom. Sierra Club v. Clark*, 774 F.2d 1406 (9th Cir. 1985).**

Plaintiffs challenged both the Bureau of Land Management's (BLM) California Desert Conservation Management Plan, which designated a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 9, 2003

Mr. Daniel R. Griffith
State Historic Preservation Officer
Division of Historical and Cultural Affairs
15 The Green
Dover, Delaware 19901-3611

Dear Mr. Griffith:

This letter responds to your correspondence of September 9, 2002, in which you disagreed with the NRC staff position that the Delaware portion of the Peach Bottom-to-Keeney transmission line corridor is outside the Area of Potential Effects (APE) for the proposed renewal of the operating licenses for the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The NRC staff has considered your views and has determined that the Delaware portion of the Peach Bottom-to-Keeney transmission corridor is outside of the APE. Notwithstanding any representations made by NRC applicants, the Agency official (the Director, Office of Nuclear Reactor Regulation) has determined that the APE for a license renewal action is the area at the power plant site and its immediate environs which may be impacted by post-license renewal land disturbing operation or projected refurbishment activities associated with the proposed action. The APE may extend beyond the immediate environs in those instances where post-license renewal land disturbing operations or projected refurbishment activities specifically related to license renewal of the nuclear power plant potentially have an effect on known or proposed historic sites. This determination is made irrespective of ownership or control of the lands of interest.

For the proposed PBAPS license renewal, the licensee has stated, and our review has shown, that there will be no major structural modifications, that maintenance activities will be confined to previously disturbed areas, and that there will be no additional land disturbance. Further, the NRC staff has determined that the decision to approve or deny the requested license renewals would not affect maintenance practices or land disturbances beyond the substations at the PBAPS site where the generating units are connected to the distribution system. Therefore, the APE for the proposed PBAPS license renewal is the plant site, which is wholly within the Commonwealth of Pennsylvania. The PBAPS APE does not extend into Maryland or Delaware. In its letter of December 14, 2000, the Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation (the State Historic Preservation Office), determined that National Register-listed, eligible, historic, and archeological resources are present in the general vicinity of the PBAPS site, and stated an opinion that the proposed license renewal will not affect any of those resources. The NRC staff agreed with this determination and opinion. Therefore, consultation was not required.

In response to your interest in the degraded portion of the feeder canal, where it crosses the transmission line corridor in Delaware, the NRC staff included this site in its review of environmental resources of interest as the staff prepared its environmental impact statement (EIS) to comply with the National Environmental Policy Act (NEPA). The NRC staff review included a visit to the canal during the staff's PBAPS site audit in November 2001. The staff

disclosed its NEPA findings in its Draft Supplemental Environmental Impact Statement (SEIS) issued for public comment on July 5, 2002.

The NRC staff has determined that, even if the APE were to be extended through Maryland to the Delaware portion of the Keeney transmission line corridor, the proposed renewal of the PBAPS operating licenses would have no effect on the feeder canal where it crosses the Peach Bottom-to-Keeney transmission line corridor. In light of your expressed interest in this matter, we are providing, by separate correspondence, a copy of your September 9, 2002, letter, along with a copy of this reply, to the owner/operator of the Delaware portion of the Keeney transmission line corridor (who is not an NRC licensee) to ensure it is aware of your concerns (Conectiv Power Delivery, Newark, DE).

Additional information regarding the NRC staff review of your interest is enclosed. The staff will include a discussion of this matter in the Final SEIS scheduled for publication in February 2003. No further action is considered necessary. If there are any questions regarding this correspondence, please contact me at (301) 415-1444.

Sincerely,

Louis L. Wheeler, Senior Project Manager
Environmental Section
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: Additional Responses to DE SHPO Correspondence

cc w/encl: See next page

Enclosure

Responses to comments in correspondence received from the Delaware State Historical Preservation Office (DE SHPO) regarding the feeder canal:

Comment: The Atomic Energy Commission might not have met National Historic Preservation Act Section 106 responsibilities when it made its early 1970s decisions to grant operating licenses for Units 2 and 3 at Peach Bottom.

Response: The NRC staff carefully reviewed the records and found that the Atomic Energy Commission (AEC) met the compliance standard for historic preservation consideration when the AEC made its decisions to issue the initial operating licenses for Peach Bottom Atomic Power Station, Units 2 and 3 (PBAPS).

The original regulations, implementing Section 106 of the Act (36 CFR 800), were promulgated in 1979, five years after the NRC granted the original licenses for operation of Units 2 and 3 at Peach Bottom Atomic Power Station. The Advisory Council on Historic Preservation had no prescribed regulatory process for Federal agencies to demonstrate compliance with National Historic Preservation Act Section 106 responsibilities until 1979.

As required by Section 106, in 1972 the AEC provided information on the proposed action for PBAPS, including information on historic and archeological resources and determinations, to the Advisory Council on Historic Preservation with a request for comment. There is no record to indicate that the Advisory Council on Historic Preservation objected to the AEC's determinations.

The feeder canal, now identified as a historic property by the DE SHPO, was documented in September 1974, after the AEC issued the operating licenses. The Nuclear Regulatory Commission (NRC) was not aware of the feeder canal until informed by the DE SHPO's office in 2001.

Comment: The proposed license renewal is a Federal undertaking with the potential to affect historic properties.

Response: The NRC staff agrees.

Comment: The feeder canal is a historic resource that meets standards for listing on the National Register of Historic Places.

Response: Without taking a position in agreement or disagreement with the DE SHPO, the NRC staff considered the canal as though it were a historic resource potentially eligible for listing on the National Register for the limited purpose of addressing the DE SHPO's interests.

Comment: Operation of the PBAPS under the current license has caused adverse effects on the feeder canal at the transmission line crossing.

Response: Operation and maintenance of the Peach Bottom-to-Keeney transmission line was not the cause of past adverse effects on the feeder canal at the transmission line crossing. The utility corridor at the intersection with the feeder canal is approximately 400-feet wide; it is the same width as it was in 1968, well before the Peach Bottom line was added to the corridor.

Three other overhead transmission line easements, and at least one underground utility easement share the corridor at the crossing. An NRC decision to either approve or deny the license renewal applications for PBAPS would not alter maintenance practices along the Delaware portion of the Peach Bottom-to-Keeney transmission line; maintenance would continue the same with or without the use of an easement on the corridor for the Peach Bottom-to-Keeney transmission line. The licensee does not own the land at the corridor crossing of the feeder canal nor does it have maintenance responsibility for the corridor at the crossing. The corridor is clear of trees, but is grass and brush covered, and has been in a similar condition since before the Peach Bottom-to-Keeney transmission line was constructed. A gravel-surfaced utility road meanders through the corridor and crosses the remnant trench for the feeder canal underneath the Peach Bottom line, but is not exclusively for maintenance of the Peach Bottom-to-Keeney transmission line. The access road that crosses the feeder canal replaced previous fords in the area of the corridor dating back to as early as 1937.

The old feeder canal alignment remains a visible and well-defined feature along much of its original route through present-day woodlands. It displays less definition and more in-filling as it passes under the transmission corridor. The changes under the transmission corridor are cumulative effects from a range of human and natural activities that extend back in time to a period well before the addition of the Peach Bottom-to-Keeney transmission line to the utility corridor.

NRC team review of aerial photographs indicates the feeder canal remained relatively intact until after 1968. At that time, and before 1977, small noticeable changes began to occur and continue today. First, a utility road crossed the feeder canal at a new place in the transmission corridor and below the present-day Peach Bottom-to-Keeney transmission line. Second, a series of cumulative changes began then, and continue to the present. These include gradual loss of vegetation along the alignment of the canal and a progressive loss of sharpness in the features of the canal as viewed from the air.

Comment: The NRC staff should consider three specific actions to take into account the effects of the undertaking to grant the license renewals for PBAPS.

Response: The DE SHPO requests fall into two categories: (1) an action suggested with the intent to correct the perceived negative result of past operations, and (2) specific actions to prevent future deterioration of the feeder canal. The NRC staff forwarded the recommendations to the applicant in correspondence dated November 26, 2001, even though the recommended actions have no direct bearing on the undertaking.

For the license renewal period, the applicant indicated that it plans (1) no major structural modifications, (2) to limit maintenance activities to previously disturbed areas, and (3) no additional land disturbance. Consistent with the NRC's "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437), under such conditions, the NRC staff believes continued operation of PBAPS would have no effect on any known or on potential unknown or undiscovered historic or archaeological resources located in areas of potential effect.

As part of its consideration of the DE SHPO correspondence, the NRC staff completed a supplementary analysis based on a scenario which postulated the inclusion of the Delaware

portion of the Peach Bottom-to-Keeney transmission line corridor in the National Historic Preservation Act Area of Potential Effect. In that supplemental analysis, the NRC staff applied the criteria of adverse effect pursuant to 36 CFR § 800.5(a)(1) and found that the proposed undertaking to extend the PBAPS licenses would not alter the characteristics of the potentially historic property known as the Chesapeake and Delaware feeder canal. This conclusion followed consideration of DE SHPO views concerning such effects and incorporated analyses of past, present, and potential future conditions.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 9, 2003

Mr. Robert Jubic
Conectiv Power Delivery
I-95 and Route 273
P.O. Box 9230
Newark, Delaware 19714-9239

Dear Mr. Jubic:

This purpose of this letter is to inform you of an interest of the Delaware State Historic Preservation Officer (DE SHPO) in a historic property that came to our attention during our review of the license renewal application submitted by Exelon Generation, LLC, for Peach Bottom Atomic Power Station, Units 2 and 3. The interest concerns a potential historic site located in the Delaware portion of the Peach Bottom-to-Keeney transmission line corridor.

Enclosed is a letter dated September 9, 2002, from the DE SHPO to the NRC staff which provides information related to DE SHPO's interest. Also enclosed is an NRC staff reply to the September 9, 2002, letter.

If there are any questions regarding this correspondence, please contact me at (301) 415-1444.

Sincerely,

Louis L. Wheeler, Senior Project Manager
Environmental Section
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Porgrams
Office of Nuclear Reactor Regulation

Enclosures: As stated

cc w/encls: See next page

Enclosures to NRC staff Letter to Conectiv Power Delivery

There are two enclosures:

The September 9, 2002, letter from the Delaware State Historic Preservation Officer to the NRC staff is located in this Appendix at pages E-11 through E-17.

The January 9, 2003, NRC staff letter to the Delaware State Historic Preservation Officer is located in this Appendix at pages E-18 through E-22.

Appendix F

GEIS Environmental Issues Not Applicable to Peach Bottom Units 2 and 3

Appendix F

GEIS Environmental Issues Not Applicable to Peach Bottom Units 2 and 3

Table F-1 lists those environmental issues listed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) (NRC 1996; 1999)[(a)] and 10 CFR Part 51, Subpart A, Appendix B, Table B-1, that are not applicable to Peach Bottom, Units 2 and 3, because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to Peach Bottom Units 2 and 3

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered salinity gradients	1	4.2.1.2.2 4.4.2.2	The Conowingo Pond is a freshwater lake with no salinity gradient.
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING-TOWER-BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.2.2.1.2	Because Peach Bottom Units 2 and 3 operate primarily with a once-through heat dissipation system, entrainment is a Category 2 issue and is discussed in Section 4.1.2.
Impingement of fish and shellfish	1	4.2.2.1.3	Because Peach Bottom Units 2 and 3 operate primarily with a once-through heat dissipation system, impingement is a Category 2 issue and is discussed in Section 4.1.3.
Heat shock	1	4.2.2.1.4	Because Peach Bottom Units 2 and 3 operate primarily with a once-through heat dissipation system, heat shock is a Category 2 issue and is discussed in Section 4.1.4.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table F-1. (contd)

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
GROUND-WATER USE AND QUALITY			
Ground-water use conflicts (potable and service water, and dewatering; plants that use >100 gpm)	2	4.8.1.1 4.8.2.1	Peach Bottom Station uses <100 gpm of groundwater.
Ground-water-use conflicts (Ranney wells)	2	4.8.1.4	Peach Bottom Units 2 and 3 do not have or use Ranney wells.
Ground-water quality degradation (Ranney wells)	1	4.8.2.2	Peach Bottom Units 2 and 3 do not have or use Ranney wells.
Ground-water quality degradation (saltwater intrusion)	1	4.8.2.1	Peach Bottom Station uses <100 gpm of groundwater, and is not near a saltwater body.
Ground-water quality degradation (cooling ponds in salt marshes)	1	4.8.3	This refers to a feature (cooling ponds) not installed at Peach Bottom.
Ground-water quality degradation (cooling ponds at inland sites)	2	4.8.3	This refers to a feature (cooling ponds) not installed at Peach Bottom.
TERRESTRIAL RESOURCES			
Cooling pond impacts on terrestrial resources	1	4.4.4	This refers to a feature (cooling ponds) not installed at Peach Bottom.

F.1 References

10 CFR Part 51. Code of Federal Regulations, Title 10*, Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report*, "Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report." NUREG-1437, Volume 1, Addendum 1, Washington, D.C.