



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

April 14, 1997

MEMORANDUM TO: David B. Matthews, Chief
Generic Issues and Environmental
Projects Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

FROM: Claudia M. Craig, Senior Project Manager *Claudia M. Craig*
Generic Issues and Environmental
Projects Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MEETING WITH BALTIMORE GAS & ELECTRIC (BGE) TO
DISCUSS LICENSE RENEWAL ENVIRONMENTAL REPORT (ER) TEMPLATE
PROCESS

The subject meeting was held at the Nuclear Regulatory Commission (NRC) offices in Rockville, Maryland on April 8, 1997, between representatives of BGE and the NRC staff. The purpose of the meeting was for BGE to provide the revised ER template, four examples of the level of detail of the ER, and responses to staff comments/questions. Selected issues were also discussed. Attachment 1 is a list of meeting participants. Attachment 2 is a copy of the material provided by BGE.

BGE proposed the ER template process in order to develop a format and content guide for the ER to be submitted in support of a license renewal application. Existing NRC guidance is currently being updated to reflect the revised 10 CFR Part 51, which includes the environmental requirements of a license renewal application. BGE anticipates completing their ER prior to final guidance being issued by the Commission, thus, the effort on the template to determine an acceptable format and content. It is the staff and BGE's objective that the completed environmental report template outline a format and content such that if an ER is submitted which follows the template and contains sufficient information, it is likely the report would be accepted for review.

BGE provided the staff with its responses to the staff comments/questions. One change to the template in the area of threatened and endangered species resulted from the comments. The staff and BGE discussed each issue to further understand BGE's position. As a result of the discussions, the staff committed to further discuss the following issues and provide the staff's current position on: the need for BGE to look at the impacts at the plant, in addition to looking at the impacts of alternative energy sources, if license renewal does not occur; the need for BGE to consider mitigative measures for Category 2 issues that will not cause any significant impact (i.e. where impacts are de minimis, no need to discuss mitigation measures); and BGE's treatment of Category 1 and new and significant information. *DFC1/1*

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Additionally, the staff will review and comment on the responses to the comments/questions, the revised template, the examples, and the clarification paper on selected topics, including the treatment of electric shock hazard. The examples will be reviewed for format and content only and will not be reviewed for technical merit. BGE stated that for severe accident mitigation alternatives (SAMAs), a line by line comparison with the Watts Bar severe accident mitigation design alternatives review is being performed and that a work scope is being developed. After the work scope is developed, BGE will determine whether further interaction with the staff is needed for clarification purposes.

The participants agreed to set up a meeting in early May to discuss the staff comments on the revised template, the examples, and selected topics. The participants also agreed to set a date in late May for a senior management meeting between BGE and NRR. The senior management meeting would inform upper levels of management of the progress of the ER template effort and, if issues still remain, identify those to management.

Docket Nos. 50-317, 50-318

Attachments: As stated

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BGE / NRC MEETING
ENVIRONMENTAL REPORT TEMPLATE PROCESS

APRIL 8, 1997

MEETING PARTICIPANTS

<u>NAME</u>	<u>ORGANIZATION</u>
Claudia Craig	NRC/NRR/PGE
Gene Holler	NRC/OGC
Don Cleary	NRC/RES/DRA
Lance W. McCold	ORNL
Scott Flanders	NRC/NRR/PDLR
Rich McLean	MD Dept. Natural Resources
Jim Bennett	BGE
David Lewis	Shaw Pittman
Barth W. Doroshuk	BGE
Robert Tucker	BGE
Jon Cudworth	Halliburton NUS
Tricia Heroux	EPRI
James T. Weber	American Electric Power
Kathryn M. Sutton	Winston & Strawn
Thomas W. Yocum	Duke Power Co.
N.P. Kadambi	NRC/RES/DRA
Diane H. Richardson	ComEd
Ralph Architzel	NRC/NRR/PGE

April 14, 1997

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DATE	4/9/97	4/10/97	4/14/97

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Life Cycle Management Unit

License Renewal Discussions

10CFR Part 51

April 8, 1997

Robert L. Tucker

Purpose of Meeting

- Provide BGE responses to staff comments on 2/5/97 Template
- Submit revised Template
- Provide further input regarding BGE positions on several issues
- Submit examples exercising the Template
- Establish agenda, schedule for future interactions

BGE Responses to NRC Comments

- Only one Template change made (§4.1.7)
- Further clarification on use of the Template provided in the responses
- Revised input provided on BGE positions regarding Electric Shock, SAMAs, treatment of Category 1 GEIS issues, and consideration of mitigation for N/A Category 2 GEIS issues and Category 2 issues with insignificant or negligible impact

Examples

- Being provided for format and content only
- Complete vertical slice of Template sections
- Based on information produced in 2/17/97 rough draft of BGE ER (written to 2/5/97 Template)
- Examples provided for groundwater use conflicts, public services - transportation, transportation (SNF and HLW) Table S-4 only, impingement, and one alternative (coal fired replacement at Calvert Cliffs site)

Path Forward

- NRC develop comments on the BGE examples and position paper
- Set up final staff meeting for BGE to submit revised examples and any other final deliverables
- Schedule Senior Management meeting

Template for the Calvert Cliffs Nuclear Power Plant License Renewal Environmental Report

Introduction

This template provides an outline of the Baltimore Gas and Electric Company (BGE) environmental report (ER) for Calvert Cliffs Nuclear Power Plant (CCNPP) license renewal. The Template is annotated to describe the contents of each section and to identify the regulatory requirement being addressed.

BGE has based the contents of the outline on U.S. Nuclear Regulatory Commission (NRC) regulatory requirements found at Title 10, Code of Federal Regulations, Part 51, Section 53, Paragraph (c) *Operating license renewal stage* [10 CFR 51.53(c)].¹ Attachment 1 provides cross-references from regulatory requirements to ER sections that this Template identifies.

Regulation 10 CFR 51.53 does not specify a format for an ER. However, NRC would use the ER as input when preparing a CCNPP license renewal environmental impact statement in accordance with National Environmental Policy Act requirements. To expedite NRC usage of the ER, BGE has formatted it to follow NRC format for presentation of materials in an environmental impact statement.²

Environmental Report Template

Summary [format from 10 CFR 51.70(b) and 10 CFR 51 Subpart A, Appendix A, Section 3]

Summarize ER, stressing major issues; identify any unresolved issues; and present major conclusions and recommendations.

1. Purpose of and need for action [required by 10 CFR 51.45(b) as incorporated by 10 CFR 51.53(c)(2)]

Describe the purpose of the proposed action as that of providing an option that allows for power generation capability beyond the term of the plant's current operating license to meet future system generating needs (input from 61 FR 109, 6/5/96, p 28472)

2. Alternatives including the proposed action

2.1 Proposed action [required by 10 CFR 51.53(c)(2) and 10 CFR 51.45(b) as referenced in 10 CFR 51.53(c)(2)]

- § 2.1 would provide sufficient information about CCNPP to facilitate an understanding of the applicable § 4.1 issues and mitigation alternatives
- To facilitate NRC review, references to background information provided in previous CCNPP documents (e.g., Final Environmental Statement) would be provided

2.1.1 General plant information

- Describe CCNPP location, site, plant. Use figures to illustrate
- Identify FES. Use table to list post-FES National Environmental Policy Act documentation

¹ *Federal Register*, Vol. 61, No. 244, December 18, 1996, pages 66537-66554; *Federal Register*, Vol. 61, No. 109, June 5, 1996, pp. 28467-28496; and *Federal Register*, Vol. 61, No. 147, July 30, 1996, pp. 39555-39556.

² 10 CFR 51.70(b) and 10 CFR 51 Subpart A, Appendix A, Section 1(a).

2.1.2 Nuclear fuel and radioactive waste (input to ER § 4.1.18)

- Describe unirradiated fuel shipments to CCNPP
- Describe fuel form and enrichment
- Describe reactor core thermal power level
- Describe irradiated fuel burnup rate, handling
- Describe irradiated fuel and other radioactive solid waste shipments from CCNPP

2.1.3 Heat dissipation system (input to ER §§ 4.1.2, 4.1.3, and 4.1.4)

- Describe CCNPP cooling system (e.g., once-through heat dissipation system)

2.1.4 Groundwater use (input to ER § 4.1.5)

- Describe CCNPP wells. Use table to summarize characteristics (e.g., depth, aquifer, capacity) and figure to illustrate locations relative to site boundary
- Identify historical pumping rates (show greater than 100 gallons per minute). Use table to summarize data. Discuss any trend and use figure to illustrate

2.1.5 Transmission facilities (input to ER § 4.1.9)

- Describe CCNPP transmission facilities and changes since original licensing. Use figure to illustrate locations
- Describe change in use of the lines since original licensing

2.1.6 Modifications [required by 10 CFR 51.53(c)(2)] (input to ER §§ 2.1.7, 4.1.6, 4.1.7, and 4.1.16)

- Summarize CCNPP physical modifications as result of integrated plant assessment (IPA)
- Summarize changes to (or addition of) administrative control procedures from IPA

2.1.7 Employment (input to ER §§ 4.1.8, 4.1.10, 4.1.11, 4.1.12, 4.1.13, 4.1.14, 4.1.15)

- Describe number of CCNPP workers during routine operations and during refueling outages and the portion estimated living in Calvert County
- Predict total refurbishment manpower requirements
- Describe any projected increase in staffing number during license renewal term
- Explain differences in CCNPP employment projections versus GEIS estimates

2.2 Alternatives [required by 10 CFR 51.53(c)(2)]

If the CCNPP licenses were not renewed, the plant would be decommissioned and an alternative power supply would be considered to meet the demand for power. This section will present various power supply alternatives to meet the demand. Feasible alternatives considered will be presented. For each feasible alternative, a general description would be provided with manpower estimates, emission discussion, description of cooling water system, delivery systems, and technology alternatives within the alternatives. Impacts will be summarized in § 2.3.

2.2.1 Feasible Alternatives

2.2.1.1 Example - Coal-fired plant construction at Calvert Cliffs site

- Provide general description of plant, including acreage and manpower needed
- Describe construction, manpower
- Describe coal delivery system (barge dock, coal pile), maintenance dredging
- Describe cooling water system including potential use existing system.
- Describe air emissions
- Describe ash handling

2.2.2 Other Alternatives

- Briefly discuss non-feasible alternatives
- For each alternative, provide basis for concluding non-feasible

2.3 Proposed action/Alternatives summary comparison

- Discuss differences in environmental impacts from proposed action (ER § 4.1) and alternatives (ER § 4.2)
- Provide tabular comparison between proposed action and alternatives for each Category 2 issue applicable to CCNPP and any other Category 2 or 1 issue applicable to an alternative(s) for which impact is moderate or large

3. Affected environment

Provide sufficient information to support each of the below § 4.1 analyses of Category 2 issues and any new and significant information, if any.

3.1 Biological resources

3.1.1 Aquatic ecology (input to ER § 4.1.2, 4.1.3, and 4.1.4)

- Describe CCNPP aquatic ecology
- Describe any Maryland Department of Natural Resources efforts to restore or increase fish and shellfish populations or habitat in CCNPP vicinity

3.1.2 Terrestrial Ecology (input to ER § 4.1.6)

- Describe CCNPP terrestrial ecology (if affected by refurbishment activities)

3.1.3 Special Status Species (input to ER § 4.1.7)

- Describe CCNPP special status (threatened and endangered) aquatic species
- Describe CCNPP special status (threatened and endangered) terrestrial species

3.2 Geology and groundwater hydrology (input to ER § 4.1.5)

- Describe CCNPP and area geology as it applies to groundwater aquifers affected by CCNPP. Use a figure to graphically illustrate the geology
- Describe CCNPP and area groundwater hydrology. Use a table to summarize information about aquifers and a figure to illustrate potentiometric surface trending
- Identify offsite wells and groundwater usage. Use a table to summarize data and a figure to illustrate location of nearest well finished in the aquifer that CCNPP uses

3.3 Air quality (input to ER § 4.1.8)

- Describe National Ambient Air Quality Standards (NAAQS) status of CCNPP area
- Identify closest nonattainment and maintenance area for vehicle emissions

3.4 Housing (input to ER § 4.1.10)

- Describe historical growth rate and the percent attributable to the CCNPP work force
- Describe current CCNPP-area housing availability (permanent and temporary)

3.5 Public services (input to ER §§ 4.1.11, 4.1.12, and 4.1.15)

- Identify CCNPP-area public water supply systems (input to ER § 4.1.11)
- Describe any systems having problems meeting base or peak demand
- For any system having supply problems, estimate percent of demand attributable to CCNPP staff and indirect multiplier
- Describe the adequacy of the County's educational system (input to ER § 4.1.12)
- Describe adequacy of local level of services for transportation (input to ER § 4.1.15).

3.6 Offsite land use (input to ER §§ 4.1.13 and 4.1.14)

- Describe trends in land use
- Describe land use with regard to residential and commercial development in Calvert County
- Use figures to illustrate location and general features

3.7 Cultural resources (input to ER § 4.1.16)

For plant site and transmission line right-of-way:

- Describe past cultural resource investigations
- Describe prehistoric and historic resources
- Describe current cultural resource protection activities

3.8 Demography (input to ER §§ 4.1.10, 4.1.11, 4.1.12, 4.1.13, 4.1.14, 4.1.15, and 4.1.17)

- Describe population size and distribution around CCNPP
- Use figure to identify sectors and tables to summarize data

4. Environmental consequences and mitigating actions

4.1 Proposed action

For each issue in §§ 4.1.2 through 4.1.18 (except as specifically noted), discuss the bulleted items below plus the issue specific information listed within each section.

- State the issue
- Identify GEIS reason for not making Category 1 and discuss how reason applies in case of CCNPP
- Identify and discuss alternative mitigation measures [required by 10 CFR 51.53(c)(3)(iii)]
- Identify whether impact, after intended mitigation, is small, moderate, or large, as defined below (10 CFR 51 Subpart A, Appendix B, Table B-1, footnote 3):

Small- for the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource

Moderate- for the issue, environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource

Large- for the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource

4.1.1 Introduction

- Adopt by reference NRC GEIS conclusions for Category 1 issues
- Indicate the Category 2 issues that are not applicable to CCNPP and provide basis for conclusion
- Reference Appendix A for identification of ER sections that address specific Category 2 issues

4.1.2 Entrainment [required by 10 CFR 51.53(c)(3)(ii)(B); Table B-1 Issue Number 25]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 2.1.3 for description of the heat dissipation system
- Reference ER § 3.1.1 to support discussion of mitigation alternatives
- Describe 316(b) requirement and history of CCNPP compliance
- Use Appendix B to provide copy of pages from CCNPP 1982 discharge permit that references 316(b) study

4.1.3 Impingement [required by 10 CFR 51.53(c)(3)(ii)(B); Table B-1 Issue Number 26]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 2.1.3 for description of the heat dissipation system
- Reference ER § 4.1.2 for discussion of CCNPP 316(b) study
- Reference ER § 3.1.1 to support discussion of mitigation alternatives

4.1.4 Heat shock [required by 10 CFR 51.53(c)(3)(ii)(B); Table B-1 Issue Number 27]

In addition to the general information called for above in § 4.1 include the following:

- Describe 316(a) requirement and applicability to CCNPP
- Use Appendix B to provide copy of pages from CCNPP 1982 discharge permit that document compliance

4.1.5 Groundwater use [required by 10 CFR 51.53(c)(3)(ii)(C); Table B-1 Issue Number 33]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.2 discussion of geology and groundwater hydrology
- Calculate current drawdown at CCNPP site boundary attributable to CCNPP withdrawal
- Project drawdown attributable to withdrawal during license renewal period. Include calculations as Appendix C
- Provide basis for conclusions regarding impacts to a hypothetical site boundary well

4.1.6 Refurbishment impacts (to terrestrial resources) [required by 10 CFR 51.53(c)(3)(ii)(E); Table B-1 Issue 40]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.1.2 discussion of terrestrial ecology and § 2.1.6 for discussion of refurbishment scope
- Describe effect of refurbishment activities on plant operations and the outside environment or effluents

4.1.7 Threatened and endangered species [required by 10 CFR 51.53(c)(3)(ii)(E); Table B-1 Issue 49]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.1.3 discussion of special status species and ER § 2.1.6 for discussion of plant modifications
- Describe effect of refurbishment activities and license renewal term operations on important plant and animal habitats
- Describe effect of plant modifications on threatened and endangered species
- Describe status of consultation with Maryland Heritage Program, U.S. Fish and Wildlife Service, and National Marine Fisheries Service. Include as Appendix D copies of BGE request for consultation and agencies' responses

4.1.8 Air quality during refurbishment (nonattainment and maintenance areas) [required by 10 CFR 51.53(c)(3)(ii)(F); Table B-1 Issue 50]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.3 discussion of air quality and ER § 2.1.7 for refurbishment work force
- Provide basis for calculation of increased staff vehicles' emissions

4.1.9 Electric shock [required by 10 CFR 51.53(c)(3)(ii)(H); Table B-1 Issue 59]

- Present issue statement and categorization as described above in § 4.1 (exclude discussion of mitigation alternatives and impact extent)
- Reference ER § 2.1.5 discussion of transmission lines
- Explain inapplicability of this issue to the proposed action due to changes in transmission line use since original licensing

4.1.10 Housing impacts [required by 10 CFR 51.53(c)(3)(ii)(I); Table B-1 Issue 63]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.4 discussion of housing, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of refurbishment and license renewal term work force
- Compare increase in staff to normal operations and refueling outage staff numbers
- Project impacts to housing from increased number of staff during refurbishment and license renewal term

4.1.11 Public services: public utilities [required by 10 CFR 51.53(c)(3)(ii)(I); Table B-1 Issue 65]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.5 discussion of public services, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of refurbishment and license renewal term work force
- Compare increases in staff to normal operations and refueling outage staff numbers
- Project impacts to public water supply from increased number of staff during refurbishment and license renewal term

4.1.12 Public services, education (refurbishment) [required by 10 CFR 51.53(c)(3)(ii)(I); Table B-1 Issue 66]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.5 discussion of public services, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of refurbishment work force
- Compare increase in staff number from refurbishment to normal operations and refueling outage staff numbers
- Project impacts to education system from increased number of staff during refurbishment

4.1.13 Offsite land use (refurbishment) [required by 10 CFR 51.53(c)(3)(ii)(I); Table B-1 Issue 68]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.6 discussion of offsite land use, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of refurbishment work force
- Compare increase in staff number from refurbishment to normal operations and refueling outage staff numbers
- Project impacts to offsite land use from increased number of staff during refurbishment

4.1.14 Offsite land use (license renewal term) [required by 10 CFR 51.53(c)(3)(ii)(I); Table B-1 Issue 69]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.6 discussion of offsite land use, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of license renewal term work force
- Compare increase in staff number during license renewal term to normal operations staff numbers
- Project impacts to offsite land use from increased number of staff during license renewal term

4.1.15 Public services, transportation [required by 10 CFR 51.53(c)(3)(ii)(J); Table B-1 Issue 70]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.5 discussion of offsite land use, ER § 3.8 discussion of demography, and ER § 2.1.7 discussion of refurbishment work force
- Compare increase in staff number during refurbishment to normal operations and refueling outage staff numbers
- Project impacts to transportation from increased number of staff during refurbishment

4.1.16 Historic and archaeological resources [required by 10 CFR 51.53(c)(3)(ii)(K); Table B-1 Issue 71]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 3.7 discussion of cultural resources and ER § 2.1.6 discussion of refurbishment scope
- Describe refurbishment and license renewal term impact to cultural resources
- Describe status of consultation with Maryland Historic Trust (State Historic Preservation Officer). Include as Appendix E copies of BGE request for consultation and agency response

4.1.17 Severe accident mitigation alternatives [required by 10 CFR 51.53(c)(3)(ii)(L); Table B-1 Issue 76]

- Approach TBD

4.1.18 Transportation [uranium fuel cycle and waste management] [required by 10 CFR 51.53(c)(3)(ii)(M); Table B-1 Issue 85]

In addition to the general information called for above in § 4.1 include the following:

- Reference ER § 2.1.2 for discussion of CCNPP fuel enrichment and burnup
- Discuss how CCNPP fuel characteristics differ from Table S-4 criteria
- Describe NRC generic and CCNPP-specific analyses for higher enrichment and burnup rates
- Provide bounding analysis of Table S-4 generic impacts and NRC sensitivity analysis in the GEIS
- Include Federal Register notices of NRC transportation assessments in Appendix G
- Approach to cumulative and synergistic impacts at Yucca Mountain [TBD]

4.1.19 New and significant information [required by 10 CFR 51.53(c)(3)(iv)]

If new and significant information exists, the following would be presented:

- Describe any CCNPP-specific information that would make a GEIS analysis or conclusion for a Category 1 issue not applicable for CCNPP (none known now)

4.2 Alternatives [required by 10 CFR 51.53(c)(2)]

For each of the feasible Alternatives to meet the power demands (ER § 2.2), discuss the following:

- Reference applicable discussion of Alternatives in the GEIS Chapter 8, Alternatives to License Renewal
- Describe significant issues addressed in § 4.1 plus any other applicable Category 2 or 1 issue for which impact would be moderate or large
- Provide sufficient detail for NRC to determine whether or not environmental impacts of license renewal are so great, compared to the Alternatives, that preserving the option of license renewal for future decision makers would be unreasonable [10 CFR 51.95(c)(4)].

4.3 Committed resources

4.3.1 Unavoidable adverse impacts [required by 10 CFR 51.45(b)(2) as referenced in 10 CFR 51.53(c)(2)]

- Summarize adverse impacts that § 4.1 identifies for the proposed action (i.e., license renewal) as unavoidable after minimization by proposed mitigative measures
- Note that Category 1 adverse impacts covered by GEIS

4.3.2 Irreversible or irretrievable resource commitments [required by 10 CFR 51.45 (b)(5) as referenced in 10 CFR 51.53(c)(2)]

- Identify subset of § 4.3.1 impacts that are permanent or of such long-term impact as to be considered permanent.
- Note that discussion does not include Category 1 commitments covered by GEIS

4.4 Short-term use versus long-term productivity [required by 10 CFR 51.45 (b)(4) as referenced in 10 CFR 51.53(c)(2)]

- Describe GEIS Category 1 impacts and § 4.1 Category 2 impacts as local short-term uses of man's environment (or identify any that are not short-term).
- Identify any ways that these short-term uses affect the maintenance and enhancement of long-term productivity of man's environment.

5. Compliance status [required by 10 CFR 51.45(d) as referenced in 10 CFR 51.53(c)(2)]

5.1 Proposed action

- List approvals Federally required for license renewal. Identify compliance status
- Include, as Appendix H, copy of any approvals received and applicable State regulations
- Discuss status of compliance with Federal, State, and local environmental protection requirements. Use table to illustrate compliance status

5.2 Alternatives

- Identify whether the feasible Alternatives would comply with Federal, State, and local environmental protection requirements

6. References

Appendix A NRC NEPA Issues for License Renewal of Nuclear Power Plants

- List and number each issue from 10 CFR 51 Table B-1
- For each issue, identify where in the ER the issue is discussed
- Identify issues not applicable to CCNPP (e.g., due to physical characteristics of the plant)

Note: Referred to in ER § 4.1.1

Appendix B 316(a) and 316(b) documentation

- Provide copy of pages from CCNPP 1982 discharge permit that mention 316(b) study and that documents 316(a) compliance

Note: Referred to in ER § 4.1.2 and 4.1.4

Appendix C Offsite well impact calculation

- Include well impact calculation

Note: Referred to in ER § 4.1.5

Appendix D Special status species consultation

- Include copies of BGE request for consultation and agencies' responses

Note: Referred to in ER § 4.1.7

Appendix E Cultural resources consultation

- Include copies of BGE request for consultation and agency response

Note: Referred to in ER § 4.1.16

Appendix F Severe accidents

- Include detailed severe accidents discussion

Note: Referred to in ER § 4.1.17

Appendix G NRC Transportation Assessments

- Include copies of relevant NRC Transportation Assessments published in the *Federal Register*

Note: Referred to in ER § 4.1.18

Appendix H Approvals

- Provide copies of any other agency approvals

Note: Referred to in ER § 5.1

Baltimore Gas and Electric Company
Response to NRC General Comments/Questions
On the Template for the CCNPP License Renewal Environmental Report

- Section 2.1.1, second bullet
"Use table to list post-FES NEPA documentation" - does this mean post-NEPA legislation/rules that have been passed or documentation specific to CCNPP with regard to post-NEPA requirements?

Response

This table will list all post-FES licensing actions taken at Calvert Cliffs on which NRC performed some level of environmental review (e.g., EIS, EA/FONSI, categorical exclusion, etc.). It is BGE's intention with this table to compile for NRC all environmental reviews performed for the Calvert Cliffs plant. These reviews will be referred to in the ER when necessary to support analysis and conclusions on various topics.

- Section 2.2. - Alternatives
Scope of alternatives review is in Chapter 8 of GEIS and 61 FR 28483 and should include: 1) environmental impacts of termination of operation and decommissioning CCNPP, 2) construction of feasible alternative generating capacity to replace CCNPP, 3) power imports, 4) additional energy conservation measures in the service area (demand-side management and conservation), 5) mix of the above alternatives.

Response

BGE agrees with this scope of review for alternatives with one exception and one clarification. First, BGE does not intend to look at environmental impacts of decommissioning CCNPP, as suggested in item one above, because A) these impacts will still occur regardless if license renewal occurs (i.e., license renewal will only delay these eventual impacts) and B) NRC has already evaluated generically the environmental impacts of decommissioning in NUREG-0586. Secondly, BGE will look at an energy/technology mixture alternative but will not evaluate an exhaustive list of potential energy/technology combinations. The mixture alternative that will be evaluated will be based on energy/technology combinations reasonable for BGE's service area and that our State agencies agree are reasonable combinations. A Template change in this area is not necessary because specific alternatives are not listed in the Template.

- Section 2.3
What is the purpose of putting the summary comparison of environmental impacts here rather than under 4.2 where the impacts are identified and evaluated?

Response

This is the standard convention specified in NEPA regulations and in NRC guidance in 10 CFR 51.71(b) and Subpart A, Appendix A, Section 1(a). BGE simply deferred to this guidance and made no attempt to reorganize this NRC format since it was consistent with standard NEPA guidelines.

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- Sections 3 and 4 - Does BGE plan to include in the ER the type of information similar to that in RG 4.2 for the details of Sections 3 and 4? (the words "describe" lack level of detail)

Response

The level of detail in the ER will not be equivalent to that in RG 4.2 in most cases. This is primarily because RG 4.2 was written to address construction and initial operation types of impacts which can be large impacts. At the license renewal stage for a plant with little or no refurbishment activities (such as CCNPP), environmental issues are well understood and impacts are not as severe. As such, less information regarding the environment is needed to characterize impacts. BGE acknowledges that NRC can not determine level of detail from statements in the Template such as "Describe CCNPP cooling system." Clarification regarding such statements will be realized as examples exercising the Template are reviewed by NRC. Therefore, at this time, BGE does not plan to modify the Template. If upon reviewing the examples NRC determines that more clarification is still needed, BGE will consider a Template change.

- Sections 3.1 - Does BGE plan to only describe [the] environment if affected by [the] proposed action or describe it and then say it is not affected?

Response

In writing Chapter 3, as stated by the Template, BGE intends to provide "...sufficient information to support each of the...section 4.1 analyses of Category 2 issues and any new and significant information, if any." Thus, in accordance with standard NRC and NEPA practice, BGE only intends to describe the environment at CCNPP affected by the proposed action.

- Sections 4.1 - Need to address environmental impacts from the proposed action - then look at alternatives and at the impact after mitigation - (Issue, identify impact, discuss alternative mitigation measures, identify after mitigation what impact is)

Response

The basic flow path for analysis of Category 2 issues in sections 4.1.2 - 4.1.18 is as indicated in the parenthetical portion of NRC's comment. However, the Part 51 regulation does allow for some exceptions to this level of analysis and BGE would invoke these exceptions where applicable to do so. For example, BGE does not plan to discuss alternative mitigation measures for Category 2 issues that are not applicable to CCNPP. These issues will simply be listed in section 4.1.1 with a basis statement for why they are not applicable. Likewise, for the Category 2 issues of impingement, entrainment, and heat shock (Template sections 4.1.2 - 4.1.4) Part 51 instructs the applicant to only assess impacts if it can not provide appropriate Clean Water Act 316 documentation. Since BGE can provide this documentation, no assessment of impacts

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would be provided for these issues. Consequently, lacking an impact assessment, BGE does not feel it is necessary to then discuss mitigation alternatives for these issues. Finally, in assessing the impacts of the remaining applicable Category 2 issues in sections 4.1.5 - 4.1.18, BGE may discover that the proposed action will not cause any significant impact. BGE feels that since 10 CFR 51.51(c)(3)(iii) only requires consideration of alternatives for reducing "adverse impacts", there should be no need to discuss mitigation where the impacts are de minimis.

More detail justifying BGE's position regarding these topics can be found in the attached position paper.

- Sections 4.1.1
How does BGE plan to adopt by reference NRC GEIS conclusion[s] for Category 1 issues? How does BGE ensure GEIS applies to CCNPP? Affirmation statement? Any systematic effort to become aware of any new and significant information should be explained briefly in the ER, but the analysis need not be included. New information is any factor resulting in an environmental impact which either was not considered in the GEIS or the magnitude exceeds that described in the GEIS. Significant information must be shown to change the findings for a Category 1 issue to cause a substantial environmental impact that is not identified in the GEIS.

Response

BGE plans in section 4.1.1 to include a sentence stating that BGE adopts by reference the conclusions of the GEIS analysis for all Category 1 issues. BGE feels that, pursuant to Part 51, applicants are not required to analyze Category 1 issues in the ER nor are they required to demonstrate that they are bounded by the Category 1 determinations. BGE feels that any requirement to perform such an analysis would be inconsistent with both the literal language and the purpose of the rule.

Similarly, regarding new and significant information, BGE plans in section 4.1.19 to provide new and significant information of which we are aware. BGE interprets this requirement in 10 CFR 51.53(c)(3)(iv) as an obligation to identify significant new information when we know of such information but not as an obligation to perform further studies or reviews to develop such information.

More detail justifying BGE's position regarding these topics can be found in the attached position paper.

- The ER should present a sufficiently broad picture of refurbishment and operating activities/changes to allow the NRC reviewers (and the public) to make the judgment that it is unlikely that there is new and significant information not reported in the ER that may bring any Category 1 GEIS finding into question.

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Response

According to 10 CFR 51.53(c)(2), BGE is only required to describe its "...plans to modify the facility or its administrative control procedures as described in accordance with section 54.21..." Additionally, this discussion should be limited to "...modifications directly affecting the environment or affecting plant effluents." BGE can not, and does not intend to, provide detailed descriptions of proposed CCNPP refurbishment activities such as to allow a reader to ascertain, beyond any doubt, that there could be no new and significant information regarding these modifications. Additionally, BGE does not intend to describe operating activities/changes associated with license renewal if those changes do not, either directly or indirectly, affect the environment or plant effluents. If during preparing this description BGE finds new and significant information regarding the environmental impacts of license renewal, this information will be clearly discussed in section 4.1.19.

- Section 4.1.7, Threatened and Endangered Species
Need to look at both refurbishment period and continued operation - both Category 2 (see Table B-1 and see pages 3-48, 3-51, and 4-122 of GEIS)

Response

BGE agrees with this comment and the Template will be changed to better reflect the requirement to look at the potential impacts on Threatened and Endangered species from both refurbishment activities and license renewal term operations.

- Does BGE have an environmental protection plan? What is the status, any need to update?

Response

BGE does have an Environmental Protection Plan developed pursuant to 10 CFR 50.36(b). This plan was not altered during BGE's recent tech spec update project and BGE has not identified anything during development of the license renewal ER to suggest that the Environmental Protection Plan needs updating.

- Section 4.1.15
Only addresses public services, transportation during refurbishment term - what about impacts of operation during renewal term? See pg. 4-106 of GEIS.

Response

BGE defers response to this question pending NRC clarification of apparent discrepancy between 10CFR51.53(c)(3)(ii)(J) and GEIS.

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- Section 4.2
Explain what is meant by "reference applicable discussion" (first bullet) and "provide sufficient detail" (third bullet). Again, starting point should be State studies and interaction

Response

Chapter 8 of the GEIS contains generic discussion of the environmental impacts from alternative forms of electric power generation as, for example, coal (Section 8.3.9). If the applicant has chosen coal-fired generation as a feasible alternative, Section 4.2 could include reference to the GEIS discussion of coal-fired generation environmental impacts. Depending on the applicability of the GEIS discussion to the applicant's alternative, the reference could take the form of an adoption by reference, a comparison, or an explanation of differences.

The level of information on the environmental impacts of alternatives should reflect the depth of analysis required for sound decisionmaking (10 CFR 51, Subpart A, Appendix A, Section 7). The decisionmaking required of the NRC is whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal would be unreasonable [10 CFR 51.95(c)(4)]. BGE interprets this to mean that the Environmental Report Section 4.2, combined with GEIS Chapter 8, must contain sufficient detail to enable NRC to make that decision. Adding detail beyond this threshold is unnecessary; for example, once sufficient detail is presented to demonstrate that impacts from the alternative would be greater than license renewal, providing additional detail about the alternative would simply demonstrate a more disparate balance. For this reason, Section 4.2 will not provide the level of detailed analysis for alternatives that the combination of the GEIS and Section 4.1 does for the proposed action (i.e., license renewal).

BGE agrees that State studies are a good starting point for data regarding alternatives. However, the NRC might find that the amount of information available from the State of Maryland is atypically large compared to other states.

- Appendix A, second bullet - for each issue, identify where in the ER the issue is discussed - are there plans to address each issue in the ER or only the Category 2s?

Response

The ER will only address applicable Category 2 issues from 10 CFR 51 Table B-1. Category 2 issues that are not applicable to CCNPP will be listed in section 4.1.1 with a very brief basis for why the issue is not applicable. No further analysis will be provided for these issues. Likewise, Category 1 issues will not be discussed in the ER. BGE will adopt by reference the GEIS conclusions for Category 1 issues in section 4.1.1.

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Appendix A is tabular in form and serves as an accounting tool of where in the ER all of the Table B-1 issues are addressed. For Category 1 issues and non-applicable Category 2 issues, Appendix A refers the reader to section 4.1.1. For applicable Category 2 issues, Appendix A refers the reader to sections 4.1.2 - 4.1.18.

- How are past commitments in the environmental arena addressed (will anything in license renewal cause the commitment to change)?

Response

The license renewal rule acknowledges that current Part 50 licensing commitments (the current licensing basis) "...must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term."

More specifically, 54.33 (c) states "Each renewed license will include those conditions to protect the environment that were imposed pursuant to 10 CFR 50.36b and that are part of the CLB for the facility at the time of issuance of the renewed license. These conditions may be supplemented or amended as necessary to protect the environment during the term of the renewed license and will be derived from information contained in the supplement to the environmental report submitted pursuant to 10 CFR Part 51, as analyzed and evaluated in the NRC record of decision. The conditions will identify the obligations of the licensee in the environmental area, including, as appropriate, requirements for reporting and recordkeeping of environmental data and any conditions and monitoring requirements for the protection of the non-aquatic environment."

Based on work to date, BGE has not identified any information that would cause any of our Part 50 environmental commitments to change. As such, it would be BGE's intention to carry all applicable environmental commitments forward through the renewal term. Since, neither Part 54 nor Part 51 require a license renewal applicant to list or describe current Part 50 commitments (environmental or otherwise), BGE does not intend to list environmental commitments in the ER and no change to the Template is needed.

From Table B-1 does BGE need to address:
Water use conflicts?
Ground water degradation - cooling ponds?
Microbiological organisms?

Response

BGE does not have to address these issues. These issues are not applicable to CCNPP because the plant does not have cooling ponds or use make-up water from a small river with low flow (water use conflicts, groundwater degradation - cooling ponds), and does not use lakes or canals, or cooling towers or cooling ponds that discharge to a small river (microbiological organisms).

Further Clarification Regarding BGE Position on Several Technical Issues

I. Introduction

During the last BGE/NRC Template discussion meeting on 3/7/97, NRC submitted their initial comments/questions on the Template and their initial responses to BGE positions with regard to several technical topics related to the form and content of an Environmental Report (ER) for the renewal of the Calvert Cliffs operating licenses. As a result of the discussion from that day and BGE's review of the Staff's comments, BGE has prepared this paper to clarify our position on the following issues: (1) to what extent must Category 1 issues be addressed in the ER; (2) to what extent must mitigation be addressed in the ER; and (3) whether the shock hazard of transmission lines must be addressed where the hazard is unaffected by license renewal.

II. Treatment of Category I Issues in a License Renewal ER

The first topic regards a question concerning the extent to which Category 1 issues must be addressed in an Environmental Report - Operating License Renewal Stage. The issues are whether a license renewal applicant is required to show that its plant is bounded by the analyses of Category 1 issues in the NRC's Generic Environmental Impact Statement (GEIS), NUREG-1437, or whether the provision in the rule requiring the ER to contain significant new information of which the applicant is aware requires such analysis or some other validation of the generic conclusions in the GEIS.

As discussed below, it is BGE's position that a license-renewal applicant is not required to analyze Category 1 issues, absent a suspension or waiver of the NRC's rule. The Category 1 issues have been addressed generically in order to promote an efficient and stable renewal process, and any requirement to perform further analyses would be inconsistent with both the literal language and the purpose of the rule.

On its face, the NRC rules governing the environmental review of license renewal applications do not require an applicant to provide any analysis of Category 1 issues. 10 C.F.R. § 51.53(c)(3)(i) provides:

The environmental report for the operating license renewal stage is not required to contain analyses of the environmental impacts of the license renewal issues identified as Category 1 issues in Appendix B to subpart A of this part.

The supplementary information published with the rule indicates that, absent new and significant information, the NRC's generic analyses of Category 1 issues need only be incorporated by reference in an applicant's ER. 61 Fed. Reg. 28,467, 28,483 (1996).

In undertaking this rulemaking, the Commission made clear that its intent was to resolve issues generically so that they would not need to be addressed in individual license renewal proceedings. "The purpose of this rulemaking is to resolve as many National Environmental Policy Act (NEPA) issues as possible before beginning plant-by-plant license renewal reviews." 56 Fed. Reg. 47,016, 47,023 (1991).

Those impacts that cannot be evaluated generically will have to be evaluated for each plant before its license is renewed.

However, the environmental impacts that can be evaluated generically will not have to be evaluated for each plant.

Id. at 47,016.

By assessing and codifying certain potential impacts on a generic basis, no need exists to address these impacts for each future license renewal.

Id. at 47,017.

The Commission did include procedural safeguards in its rule to accommodate new developments or information. In consultation with the EPA and CEG, the NRC agreed to consider all comments that might be submitted on a renewal application; and, if the NRC Staff determines that information furnished is significant and new, the NRC Staff will seek Commission approval either to suspend the rule (if the significant new information is generic) or waive the rule (if the significant new information is plant specific). SECY-93-032 at 3-4.¹ In the same vein, the Commission included in its rule the provision that "[t]he environmental report must contain any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware." 10 C.F.R. § 51.53(c)(3)(iv).

These procedural safeguards do not require an applicant to provide or prepare additional analyses. The requirement in section 51.53(c)(3)(iv) is carefully worded to require no more than the provision of information "of which the applicant is aware." This implies that an applicant has an obligation to identify significant new information when it knows of such information, but has no obligation to perform further studies or reviews to develop such information.²

The NRC's response to comments when it finalized the rule makes this position clear. The Department of Interior commented that even if a GEIS is used for license renewal, each applicant should be required to confirm these conclusions with documentation. The NRC responded:

The NRC believes that its analysis is sufficiently broad so as to apply to all plants considering license renewal. Based on the NRC's confidence in the applicability of its generic review, it does not see any reason to require that an applicant perform a site-specific validation of GEIS conclusions. The NRC believes that

¹The Commission indicated that litigation of environmental issues in a hearing will be limited to unbounded category 2 and category 3 issues [now combined] unless the rule is suspended or waived. SECY-93-032 at 4.

²This provision is analogous to 10 C.F.R. § 50.9, which requires licensees to report significant information to the NRC but does not require new studies or analyses to develop such information. An analogy may also be drawn to the obligation developed in licensing proceedings to report material information. See Virginia Electric & Power Co. (North Anna Power Station, Units 1 and 2), CLI-76-22, 4 N.R.C. 480 (1976). Here too, the obligation is to report information that is discovered, not to require the creation or generation of new information.

such a requirement eliminates the efficiency and stability sought by the Part 51 rulemaking

NUREG-1529 at p. C9-14. Thus, the Commission has explicitly stated that an applicant need not attempt to validate the generic conclusions in the GEIS.

The manner in which the categories of issues were developed also shows that an applicant is under no obligation to demonstrate that it is bounded by the Category 1 determinations. The proposed rule placed issues into three categories. Category 1 issues were those where the NRC had reached a generic impact that applies to all affected plants. Category 2 issues were those where the NRC had reached a conclusion that applies to all affected plants within certain bounds. Category 3 issues were those where the NRC had concluded that a plant-specific evaluation was required. 56 Fed. Reg. at 47,019. This is significant because it indicates the NRC's intent only to require bounding analysis for the original Category 2 issues. Further, the Commission explicitly stated that it was "proposing to limit the scope of environmental review for each plant license renewal to only those issues for which no generic conclusion could be reached (i.e., Categories 2 and 3)." *Id.* at 47,020. While the final rule subsequently combined all Category 2 and 3 issues (61 Fed. Reg. at 28,474), it made no change that would alter the treatment of Category 1 issues. The explicit requirements in 10 C.F.R. § 51.53(c)(3) to assess certain Category 2 issues if a plant does not fall within stated bounds belies any requirement for an applicant to provide or perform bounding analyses of other issues.

For all of these reasons, BGE cannot read the NRC as either requiring or implying any need for evaluation of Category 1 issues (absent a waiver of the rules). As a practical matter, any such requirement would seriously threaten the benefits of the rules, potentially opening all of the Category 1 issues to litigation through challenges that the applicant has not demonstrated its plant is bounded or has not performed a sufficient evaluation to demonstrate the absence of significant new information that might change the conclusions. Such a possibility is contrary to the NRC's intent.

III. Consideration of Mitigation in a License Renewal ER

During the meeting it was generally agreed that 10 C.F.R. § 51.53(c)(3)(iii) requires an Environmental Report - License Renewal Stage to "contain a consideration of alternatives for reducing adverse impacts, as required by § 51.45(c), for all Category 2 license renewal issues in Appendix B to subpart A of this part [51]" and that, "No such consideration is required for Category 1 issues..."

It is BGE's position that while this provision calls for consideration of mitigation alternatives for all Category 2 issues, what constitutes appropriate "consideration" will depend on the specific issue and impact. In practice, this provision must be applied in a sufficiently flexible and sensible manner to accommodate three distinct situations: (1) Category 2 issues that are not applicable to the plant; (2) Category 2 issues that do not require assessment of impacts if certain bounding conditions are met; and (3) Category 2 issues where the impacts may range from large to insignificant.

There are a number of Category 2 issues that only apply to certain types of plants. For example, 10 C.F.R. § 51.53(c)(3)(ii)(A) requires an assessment of certain impacts for plants with cooling towers or cooling ponds withdrawing water from a small river; and 10 C.F.R. § 51.53(c)(3)(ii)(C) requires an assessment of certain impacts for plants with Ranney wells or pumping more than 100 gallons of groundwater per minute. Where such Category 2 issues do not apply to a particular plant, the applicant is not required to assess the impacts associated with the issue and likewise should not be required to address mitigation. It would make no sense requiring an applicant to evaluate mitigation of an issue that does not apply to its plant.

There are also several Category 2 issues (in the case of Calvert Cliffs, entrainment, impingement, and heat shock) that require an assessment of impacts only if the applicant's plant utilizes once through cooling or cooling pond heat dissipation systems and certain Clean Water Act documentation cannot be provided. See 10 C.F.R. § 51.53(c)(3)(ii)(B). For these issues, no assessment of impacts is required if the applicant provides a copy of the current Clean Water Act documentation. Again, in cases where this rule would not require the applicant to assess any impacts, the applicant should not be required to evaluate mitigation alternatives. As a practical matter, it is hard to see how an applicant could evaluate mitigation alternatives without assessing the impacts. Consequently, the requirement to assess impacts only where Clean Water Act documentation is unavailable should similarly be construed as a requirement to consider mitigation only under the same circumstances.³

Finally, in assessing the impacts for the remaining Category 2 issues, an applicant may determine for some such issues that the proposed action will not cause any significant impact. Since 10 C.F.R. § 51.53(c)(3)(iii) only requires consideration of alternatives for reducing "adverse impacts," there should be no need to discuss mitigation where the impacts are de minimis.

³To the extent that sections 51.53(c)(3)(ii)(B) and 51.53(c)(3)(iii) might be viewed as conflicting, under the principles of statutory construction, the specific provision -- section 51.53(c)(3)(ii)(B) -- would take precedence over the more general requirement in section 51.53(c)(3)(iii).

IV. Treatment of Shock Hazard from Transmission Lines

In the 3/7/97 meeting, NRC indicated its initial position that the 10 CFR 51 rule requires an assessment of the electric shock hazard from transmission lines even if those lines will remain energized if the license is not renewed. As discussed below, BGE's position remains that neither the NRC regulations nor NEPA requires such an assessment under these circumstances, because the proposed action (license renewal) will have no impact on the potential shock hazard.

10 C.F.R. § 51.53(c)(3)(ii)(H) states:

If the applicant's transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system do not meet the recommendations of the National Electric Safety Code for preventing electric shock from induced currents, an assessment of the impact of the proposed action on the potential shock hazard from the transmission lines must be provided.

(Emphasis added.) Thus, the NRC rule only requires assessment of "the impact of the proposed action" on potential shock hazard. It does not require assessment of the potential shock hazard if such hazard is unaffected by the proposed action. Consequently, where transmission lines to the plant will remain energized in any event (as is the case for Calvert Cliffs where the lines that were constructed to connect the plant to the grid are now part of a regional loop), it should be a sufficient assessment under the rule for an applicant to state that potential shock hazard is unaffected by the proposed action.

This approach is consistent with NEPA, which only requires analysis of impacts causally related to the proposed action. NEPA requires consideration of "the environmental impact of the proposed action" (42 U.S.C. § 4322(C)(i)), and this provision has been interpreted as requiring a close causal connection between the proposed action and an alleged effect before that effect need be considered. Metropolitan Edison Company v. People Against Nuclear Energy, 460 U.S. 766, 773-74 (1983). The CEQ regulations also define the effects that must be considered in an EIS as those "which are caused by the proposed action." 40 C.F.R. § 1508.8. Consequently, NEPA does not require evaluation of effects that will be unaffected by the proposal. Burbank Anti-Noise Group v. Goldschmidt, 623 F.2d 115, 116-17 (9th Cir. 1980), cert. denied, 450 U.S. 965 (1981).

1 In accordance with the Nuclear Waste Policy Act (42 USC 10101 et seq.), DOE is preparing an
2 environmental impact statement (EIS) for a geologic repository for the disposal of spent nuclear fuel at
3 Yucca Mountain, Nevada.⁶ DOE anticipates that it will complete the EIS in the year 2000 and that the
4 EIS will cover transportation impacts.⁷ DOE will submit the EIS to the NRC as part of its construction
5 permit and license application. The Act directs NRC to adopt the EIS, to the extent practicable, in
6 connection with issuance of the construction authorization and license and that this adoption shall satisfy
7 NRC responsibilities under the National Environmental Policy Act.⁸

8 The CCNPP Unit 1 license expires July 31, 2014, which would be the earliest that BGE could ship
9 license renewal term spent fuel to Yucca Mountain and 14 years after DOE publication of the repository
10 EIS. Therefore, BGE defers to the DOE EIS discussion of generic and cumulative transportation impacts
11 in the vicinity of Yucca Mountain.

12 4.1.19 NEW AND SIGNIFICANT INFORMATION

13 NRC

14 "The environmental report must contain any new and significant information regarding the
15 environmental impacts of license renewal which the applicant is aware...." 10 CFR 51.53(c)(3)(iv)

16 "...absent new and significant information, the analyses for certain impacts codified by this rulemaking
17 need only be incorporated by reference in an applicant's environmental report for license renewal..."
18 Discussion of Regulatory Requirements, 61 FR 109, June 5, 1996, page 28483

19 BGE is not aware of new and significant information regarding the plant's environment or plant
20 operations that would make a generic conclusion codified by the NRC for Category 1 issues not
21 applicable for CCNPP that would alter regulatory or GEIS statements regarding Category 2 issues, or
22 suggest any other measure of license renewal environmental impact.

⁶ 60 FR 40164 - 40170, August 7, 1995.

⁷ Ibid. at page 40168.

⁸ 42 USC 10134(f)(4).

Issue: Transportation, Uranium Fuel Cycle and Waste Management

CHAPTER 2. ALTERNATIVES INCLUDING PROPOSED ACTION

2.1 Proposed Action

2.1.2 NUCLEAR FUEL AND RADIOACTIVE WASTE

The two CCNPP reactors are light-water-cooled reactors operated at a maximum core thermal power output level of 2,700 megawatts-thermal¹. CCNPP fuel is uranium dioxide in the form of pellets contained in zircaloy fuel rods, tubes fitted with welded end caps, shipped by truck from Missouri.

Although CCNPP was originally licensed to use pellets having a uranium-235 enrichment not exceeding 4 percent by weight,² NRC has subsequently authorized CCNPP fuel enrichment increases to 4.1 percent and, currently, 5 percent uranium-235 (Table 2.1-1, Items 7 and 16). At the same time, NRC has authorized increases in level of CCNPP spent fuel burnup,³ from the original 33,000 megawatt-days per metric ton of uranium (MWd/MTU) to the current limit of 50,000 MWd/MTU.

CCNPP operates on a 24-month refueling cycle (Table 2.1-1, Item 25) and currently stores all its spent nuclear fuel onsite in a spent fuel pool or in dry storage.⁴ CCNPP also stores mixed waste⁵ onsite, consistent with NRC and U.S. Environmental Protection Agency policy and in accordance with an agreement with the Maryland Department of the Environment. CCNPP radioactive waste shipments offsite are currently limited to the following shipments by truck:

- CCNPP to disposal site (Barnwell, South Carolina)

¹ See Table 2.1-1, Item 4, for reference to NRC environmental assessment of CCNPP power level increase to 2,700 megawatts-thermal.

² Naturally occurring uranium contains several forms of uranium including approximately 3 percent uranium-235, the form that a nuclear reactor uses. The nuclear fuel manufacturing process removes some of the other forms, resulting in a slightly higher percentage ("enrichment") of uranium-235.

³ "Burnup" is the length of use of, or total energy generated by, the nuclear fuel, and is measured as megawatt-days per metric ton. The longer the burnup, or the higher the burnup level, the greater the radiation levels in the spent fuel.

⁴ See Table 2.1-1, Item 17 for reference to NRC environmental assessment of Calvert Cliffs Independent Spent Fuel Storage Installation.

⁵ Mixed waste is waste that is governed by the Atomic Energy Act (42 USC 2011 - 2259) as radioactive material and the Resource Conservation and Recovery Act (42 USC 6901 et seq.) as hazardous waste.

- CCNPP to an offsite processing facility for segregation, recycling, compaction, and incineration
- Offsite processing facility to disposal site
- Offsite processing facility to CCNPP for reuse or storage

All CCNPP solid radwaste shipments are packaged in accordance with NRC and U.S. Department of Transportation requirements. CCNPP does not ship radwaste in other than a solid form.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES AND MITIGATING ACTIONS

4.1 Proposed Action

4.1.18 TRANSPORTATION

NRC

The environmental report must contain an assessment of transportation of fuel and waste "...in accordance with § 51.52. The review of impacts shall also discuss the generic and cumulative impacts associated with transportation operation in the vicinity of a high-level waste repository site. The candidate site at Yucca Mountain should be used for the purpose of impact analysis as long as that site is under consideration for licensing..." 10 CFR 51.53(c)(3)(ii)(M)

"...Table S-4 of this Part contains an assessment of impact parameters to be used in evaluating transportation effects in each case..." 10 CFR 51, Subpart A, Appendix B, Table B-1, Issue 85

"...The values shown in Table...S-4...are conservative estimates developed on the basis of an average fuel irradiation (burnup) of 33,000 MWd/MTU. Discussions and analyses show that the burnup level of fuel up to 60,000 MWd/MTU will not result in environmental impacts that are greater than the values currently in Table...S-4..." GEIS Section 6.2.3

§ 51.52 and Table S-4

NRC regulation 10 CFR 51.52 presents Table S-4 and indicates that, for a reactor that meets specified criteria, Table S-4 summarizes the environmental effects of transporting fuel (new and spent) and radioactive waste to and from the reactor site on a per-year basis. The table identifies heat and weight per irradiated fuel cask in transit, traffic density, and individual and cumulative dose for workers and the general population under normal conditions. The table also identifies environmental risks from

radiological and non-radiological effects under accident conditions. See Table 4.1.18-1 for a reprint of Table S-4.

The criteria in Paragraph (a) of 10 CFR 51.52 are not likely to be met by many plants now using higher burnup fuel. In such cases, applicants may incorporate in their analyses the discussion presented in the GEIS in Section 6.2.3, "Sensitivity to Recent Changes in Fuel Cycle," and Section 6.3, "Transportation" (61 FR 66538).

CCNPP meets all the § 51.52(a) criteria but the following two (see Section 2.1.2 for discussion of CCNPP nuclear fuel and radioactive waste):

Plant Parameter	10 CFR 51.52(a) Criteria	Current CNPP Authorization
Uranium-235 fuel enrichment, percent	not to exceed 4.0	5.0
Spent fuel average level of irradiation or burnup, megawatt-days per metric ton of uranium (MWd/MTU)	not to exceed 33,000	60,000

In authorizing BGE to increase CCNPP fuel enrichment to 5 percent uranium-235 and burnup to 60,000 MWd/MTU, NRC also published an environmental assessment and finding of no significant impact.⁶ NRC analyzed environmental impacts that the increased fuel enrichment and burnup and a 24-month refueling cycle would have, and decided that the findings of two earlier NRC environmental assessments are applicable to CCNPP.⁷ NRC observed that whatever increased environmental effects are attributable to increases in fuel enrichment and burnup are more than offset by the resultant longer refueling cycle, which results in less-frequent spent fuel handling and fewer shipments. NRC concluded that CCNPP transportation impacts are either unchanged or reduced from those summarized in Table S-4 and, in satisfaction of 10 CFR 51.52(b), BGE adopts by reference the NRC analysis and conclusion.

The NRC's CCNPP-specific analysis and conclusion is consistent with the NRC's generic analyses and conclusions found in GEIS Sections 6.2.3 "Sensitivity to Recent Changes in the Fuel Cycle" and 6.3 "Transportation." BGE incorporates these GEIS sections into this analysis.

In GEIS Section 6.2.3, NRC analyzes the sensitivity of Table S-4's conclusions to increases in fuel enrichment, burnup, and refueling cycle. NRC noted that while enrichment impacts increase about 5

⁶ 54 FR 4352 - 4353, January 30, 1989. Copy included in Appendix G.

⁷ 53 FR 30355 - 30358, August 11, 1988, which references 53 FR 6040 - 6043, February 29, 1988. Copies included in Appendix G.

percent with each 6-month extension of the refueling cycle, the higher burnup of fuel achieved in the longer refueling cycles reduces the average annual output of spent fuel by as much as 45 percent. Analyses show that no revision to Table S-4 would be required as a result of extended burnup up to 60,000 MWd/MTU.

In GEIS Section 6.3, based on Table S-4, NRC discussed the effects of license renewal on low-level waste, mixed waste, and spent fuel transportation. NRC determined that rail and truck transport corridors should easily accommodate the increase in low-level and mixed waste shipments from license renewal and that license renewal would result in an additional 2 to 3 days of shipments for each reactor's spent fuel under Table S-4 conditions (Table S-4 impacts are presented on the basis of a reference reactor year, so additional years of operation from license renewal do not affect the table's estimates). The environmental impacts from the transportation of fuel and waste attributable to license renewal, based on Table S-4, are found to be small. As NRC provides for in the preamble to its final license renewal environmental report rulemaking,⁸ BGE incorporates the GEIS discussion into this environmental report.

In conclusion, NRC and BGE have determined that the NRC regulation 10 CFR 51.52 Table S-4 description of environmental impact of transportation of fuel and radioactive waste to and from one light-water-cooled nuclear power reactor bounds the environmental impact from such transportation for CCNPP (CCNPP having two reactors, Table S-4 impacts must be doubled). NRC and BGE conclusions agree that environmental impacts from CCNPP transportation of fuel and radioactive waste attributable to license renewal (Issue 85) would be small.

Generic and Cumulative Impacts

Table S-4 presents bounding estimates of fuel and radioactive waste transportation environmental impacts for a single reactor. NRC indicated in the preamble to its final license renewal environmental report rulemaking⁹ that there could be additional generic and cumulative impacts of transportation, infrastructure, construction, and operation in the vicinity of a repository site.

BGE has not identified any significant generic cumulative environmental impacts of transportation, infrastructure, construction, or operation causally related to license renewal. Further, the possibility of such impacts are being addressed by the U.S. Department of Energy (DOE).

⁸ 61 FR 66537 - 66554, December 18, 1996, at page 66538, column 3.

⁹ Ibid.

1 In accordance with the Nuclear Waste Policy Act (42 USC 10101 et seq.), DOE is preparing an
2 environmental impact statement (EIS) for a geologic repository for the disposal of spent nuclear fuel at
3 Yucca Mountain, Nevada.¹⁰ DOE anticipates that it will complete the EIS in the year 2000 and that the
4 EIS will cover transportation impacts.¹¹ DOE will submit the EIS to the NRC as part of its construction
5 permit and license application. The Act directs NRC to adopt the EIS, to the extent practicable, in
6 connection with issuance of the construction authorization and license and that this adoption shall satisfy
7 NRC responsibilities under the National Environmental Policy Act.¹²

8 The CCNPP Unit 1 license expires July 31, 2014, which would be the earliest that BGE could ship
9 license renewal term spent fuel to Yucca Mountain and 14 years after DOE publication of the repository
10 EIS. Therefore, BGE defers to the DOE EIS discussion of generic and cumulative transportation impacts
11 in the vicinity of Yucca Mountain.

¹⁰ 60 FR 40164 - 40170, August 7, 1995.

¹¹ Ibid. at page 40168.

¹² 42 USC 10134(f)(4).

1 **Table 2.1-1.** National Environmental Policy Act documentation for Calvert Cliffs Nuclear Power Plant.

No.	Date	Topic	BGE submittal to NRC	NRC NEPA documentation
1.	1970	Operation	Environmental Report; Calvert Cliffs Nuclear Power Plant, November 16, 1970	See No. 2 below
2.	1973	Operation	Supplement to Environmental Report; Calvert Cliffs Nuclear Power Plant, November 8, 1971	Final Environmental Statement, April 1973
3.	1976	Discharge temperature (temporary suspension of 100 hour maximum limit for temperature rise over 10°F and discharge temperature over 90°F)	Request for operating license amendment (Letter, Lundvall to Rusche, 6/21/76)	Environmental Assessment and Finding of No Significant Impact (38 FR 8759) (Letter, Ziemann to Lundvall, 8/5/76)
4.	1977	Power level (increase to 2,700 megawatts-thermal)	Request for operating license amendments; Unit 1 (3/24/77) and Unit 2 (7/13/77)	Environmental Impact Assessment and Negative Declaration; Unit 1 (Letter, Davis to Lundvall, 9/9/77) and Unit 2 (Letter, Davis to Lundvall, 10/19/77)
5.	1979	Discharge temperature (2-year increase from 10° to 12°F delta across condenser)	Request for operating license change and plan for studying environmental impact of increased delta (Letter, Lundvall to Denton, 1/15/79)	Environmental Impact Appraisal and Negative Declaration, February 1979 (Letter, Reid to Lundvall, 2/23/79)
6.	1981	Refueling cycle (extended to 18 months)	Amendment to Environmental Report (Letter, Lundvall to Clark, 3/23/81)	
7.	1981	Fuel enrichment (increase from 4.0 to 4.1 percent U-235)	Criticality Technical Specification Amendment request (Letter, Lundvall to Clark, 10/6/81)	Conclusion that environmental impact statement or negative declaration and environmental impact appraisal not needed (Letter, Jaffe to Lundvall, 12/21/81)
8.	1982	Discharge requirements (delete non-radiological limits and monitoring)	Request for operating license amendments (Letter, Lundvall to Clark, 4/8/82) Supplementary Information (Letter, Lundvall to Clark, 4/16/82)	Conclusion that environmental impact statement or negative declaration and environmental impact appraisal not needed (Letter, Clark to Lundvall, 5/26/82)

1 **Table 2.1-1.** (continued).

No.	Date	Topic	BGE submittal to NRC	NRC NEPA documentation
9.	1984	Auxiliary feedwater system (increase period of inoperability)	Request for operating license amendment (Letter, Lundvall to Miller, 4/9/84)	Environmental Assessment and Finding of No Significant Impact (49 FR 30145, 7/20/84) (Letter, Miller to Lundvall, 7/20/84)
10.	1984	In-service inspection (extended interval)	Request for exemption from in-service inspection requirement (Letter, Lundvall to Miller, 3/6/84)	Environmental Assessment and Finding of No Significant Impact (49 FR 33764, 8/24/84) (Letter, Miller to Lundvall, 8/30/84)
12.	1985	In-service inspection (common Unit Nos. 1 and 2 start date)	Request for exemption from in-service inspection requirement (Letter, Lundvall to Miller, 3/6/84) Request for exemption from in-service inspection requirement (Letter, Lundvall to Miller, 1/28/85)	Environmental Assessment and Finding of No Significant Impact (50 FR 13893, 4/8/85) (Letter, Miller to Lundvall, 4/18/85)
13.	1985	Containment ventilation (use of hydrogen purge line)	Request for operating license amendment (Letter, Lundvall to Miller, 12/22/83) Request for operating license amendment (Letter, Lundvall to Miller, 3/26/84) Additional information (Letter, Lundvall to Miller, 8/9/85)	Environmental Assessment and Finding of No Significant Impact (51 FR 791, 1/8/86) (Letter, Thadani to Lundvall, 12/31/85)
14.	1988	Property insurance (18-month exemption from schedular requirements)	None (action initiated by NRC for each licensee)	Environmental Assessment and Finding of No Significant Impact (53 FR 38807, 10/3/88) (Letter, McNeil to Tiernan, 9/26/88)
15.	1988 - 1989	Senior reactor operator license (line management-holding requirements)	Request for operating license amendment (Letter, Tiernan to NRC, 3/15/88) Modifications [Letter, (illegible signature) to NRC, 12/2/88] Additional information (Letter, Tiernan to NRC, 1/13/89)	Environmental Assessment and Finding of No Significant Impact (54 FR 4351, 1/30/89) (Letter, McNeil to Tiernan, 1/25/89)
16.	1988 - 1989	Fuel enrichment (increase from 4.1 to 5.0 percent U-235)	Request for Operating License Amendment (Letter, Tiernan to NRC, 6/9/88)	Environmental Assessment and Finding of No Significant Impact (54 FR 4352, 1/30/89) (Letter, McNeil to Tiernan, 1/25/89)

i **Table 2.1-1.** (continued).

No.	Date	Topic	BGE submittal to NRC	NRC NEPA documentation
17.	1989	Independent Spent Fuel Storage Installation	Calvert Cliffs Independent Spent Fuel Storage Installation Environmental Report (BGE to NRC, 12/21/89)	Environmental Assessment and Finding of No Significant Impact (56 FR 13196, 3/29/91) (Letter, Haughney to Creel, 3/22/91)
18.	1989	Containment local leak rate test (schedular extension)	Request for operating license amendment (Letter, Tiernan to NRC, 12/14/88) Request for Exemption (Letter, Tiernan to NRC, 12/21/88) Response to NRC Request for Additional Information (Letter, Lippold to NRC, 2/17/89)	Environmental Assessment and Finding of No Significant Impact (54 FR 10757, 3/15/89) (Letter, McNeil to Creel, 3/9/89)
19.	1990	Final Safety Analysis Report (schedular extension for update)	Schedular Exemption Request (Letter, Creel to NRC, 6/8/90)	Environmental Assessment and Finding of No Significant Impact (55 FR 29920, 7/23/90) (Letter, McDonald to Creel, 7/16/90)
20.	1990	Containment emergency lighting (exemption from permanent installation requirement)	Request for Exemption (Letter, Creel to NRC, 6/29/90)	Environmental Assessment and Finding of No Significant Impact (55 FR 33390, 8/15/90) (Letter, McDonald to Creel, 8/8/90)
21.	1991	Containment local leak rate test (schedular extension)	Request for License Amendment (Letter, Creel to NRC, 1/18/91)	Environmental Assessment and Finding of No Significant Impact (56 FR 7420, 2/22/91) (Letter, McDonald to Creel, 2/14/91)
22.	1991 - 1992	Containment local leak rate test (schedular extension)	Request for License Amendment and Exemption (Letter, Creel to NRC, 11/27/91)	Environmental Assessment and Finding of No Significant Impact (57 FR 4894, 2/10/92) (Letter, McDonald to Creel, 1/15/92) (Letter of Correction, McDonald to Creel, 1/22/92)
23.	1992	Independent Spent Fuel Storage Installation	Calvert Cliffs Independent Spent Fuel Storage Installation Environmental Report, Revision 1	None (10 CFR 50.59 changes)
24.	1993	Site boundary changes	Supplement to the Environmental Report (Letter, Denton to NRC, 10/22/93)	Environmental Assessment and Finding of No Significant Impact (59 FR 25129, 5/13/94)

1 **Table 2.1-1.** (continued).

No.	Date	Topic	BGE submittal to NRC	NRC NEPA documentation
25.	1995	Refueling cycle (extended to 24 months)	Request for operating license amendments (Letter, Denton to NRC, 6/6/95)	Categorical Exclusion (60 FR 35061)

- 2
3 BGE = Baltimore Gas and Electric Company.
4 FR = Federal Register.
5 NEPA = National Environmental Policy Act.
6 NRC = U.S. Nuclear Regulatory Commission.

Table 4.1.18-1. Summary Table S-4 - Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor.^a

Normal Conditions of Transport			
		Environmental impact	
Heat (per irradiated fuel cask in transit)		250,000 Btu/hr.	
Weight (governed by Federal or State restrictions)		73,000 lbs. per truck; 100 tons per cask per rail car	
Traffic density:			
Truck		Less than 1 per day	
Rail		Less than 3 per month	

Exposed population	Estimated number of persons exposed	Range of doses to exposed individuals ^b (per reactor year)	Cumulative doses to exposed population (per reactor year) ^c
Transportation workers	200	0.01 to 300 millirem	4 man-rem
General public			
Onlookers	1,100	0.003 to 1.3 millirem	3 man-rem
Along route	600,000	0.0001 to 0.06 millirem	

Accidents in Transport	
	Environmental risk
Radiological effects	Small ^d
Common (nonradiological) causes	1 fatal injury in 100 reactor years; 1 nonfatal injury in 10 reactor years; \$475 property damage per reactor year

- a. Data supporting this table are given in the Commission's "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants," WASH-1238, December 1972, and Supp. 1 NUREG-75/038 April 1975. Both documents are available for inspection and copying at the Commission's Public Document Room, 2120 L Street NW., Washington, DC and may be obtained from National Technical Information Service, Springfield, VA 22161. WASH-1238 is available from NTIS at a cost of \$5.45 (microfiche, \$2.25) and NUREG-75/038 is available at a cost of \$3.25 (microfiche, \$2.25).
- b. The Federal Radiation Council has recommended that the radiation doses from all sources of radiation other than natural background and medical exposures should be limited to 5,000 millirem per year for individuals as a result of occupational exposure and should be limited to 500 millirem per year for individuals in the general population. The dose to individuals due to average natural radiation is about 130 millirem per year.
- c. Man-rem is an expression for the summation of whole body doses to individuals in a group. Thus, if each member of a population group of 1,000 people were to receive a dose of 0.001 rem (1 millirem), or if 2 people were to receive a dose of 0.5 rem (500 millirem), the total man-rem in each case would be 1 man-rem.
- d. Although the environmental risk of radiological effects stemming from transportation accidents is currently incapable of being numerically quantified, the risk remains small regardless of whether it is being applied to a single reactor or a multi-reactor site.

1

APPENDIX G. NRC TRANSPORTATION ASSESSMENTS

2

action are negligible, any alternatives with equal or greater environmental impacts need not be evaluated.

The principal alternative would be to deny the requested action. This would not significantly reduce the environmental impacts of plant operation and would result in reduced operational flexibility.

Alternative Use of Resources

This action does not involve the use of resources not previously considered by the Commission in the "Final Environmental Statement Relating to Operation of Calvert Cliffs Nuclear Power Plant, Units 1 and 2" dated April 1973.

Environmental Impact of the Proposed Amendments

These proposed changes are basically administrative in nature and are provided to facilitate the splitting of the GS-NO's roles between the GS-NO and ACS-NO.

Consequently, these proposed changes pose neither radiological nor non-radiological impacts upon the environment. The day-to-day operation of the plant shall continue to be directly supervised by a manager who holds an SRO license. This constitutes no change in the level of safety exercised in plant operations. Furthermore, the Plant Operations and Safety Review Committee shall continue to include a member with an SRO license which ensures that all nuclear safety matters will continue to be reviewed by a member who has a current detailed level of knowledge of plant operation.

Therefore, the Commission has determined that these proposed amendments pose no significant environmental impact.

Agencies and Persons Consulted

None.

Finding of No Significant Impact

Based on the aforementioned environmental assessment, the Commission has determined that the proposed amendments will not have a significant effect on the quality of the human environment.

For further details with respect to this action see: (1) The applications for license amendments dated March 15, 1988 and December 2, 1988, and (2) the licensee's supplemental letters dated June 3, 1988 and January 13, 1989. These documents are available for public inspection at the Commission's Public Document Room, 2120 L Street NW., Washington, DC, and at the Calvert County Library, Prince Frederick, Maryland.

Dated at Rockville, Maryland, this 25th day of January 1989.

For the Nuclear Regulatory Commission,
Joseph D. Neighbors,
Acting Director, Project Directorate I-1,
Division of Reactor Projects I/II.
[FR Doc. 89-2079 Filed 1-27-89; 8:45 am]
BILLING CODE 7590-01-M

[Docket Nos. 50-317 and 50-318]

Baltimore Gas and Electric Co., Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2; Environmental Assessment and Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is considering issuance of amendments to Facility Operating License Nos. DPR-53 and DPR-69, issued to the Baltimore Gas and Electric Company, (the licensee), for operation of the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, respectively, which are located in Calvert County, Maryland. The proposed amendments, submitted via the license application dated June 9, 1988, as supplemented on October 25 and November 17, 1988 would change the Units 1 and 2 Technical Specifications (TS) 5.6.1, "Criticality-Spent Fuel," and 5.6.2, "Criticality-New Fuel," to increase the maximum U-235 fuel enrichment limit from 4.1 to 5.0 weight percent and also, reduce the TS 5.6.2 maximum limit on the effective multiplication factor (K_{eff}) from 0.98 to 0.95. Additional information concerning expected core burnup levels was provided in a December 28, 1988 letter.

This assessment shall also apply to any changes proposed in the reactor core U-235 enrichment limit, up to and including 5.0 weight percent, and to proposed increases in the average level of irradiation of fuel discharged from the reactors up to a batch average discharge burnup limit of 60,000 MWD/MT.

Need for Environmental Impact Statement

The Commission has found that the proposed amendments constitute no additional significant environmental impact and as has, therefore, determined not to prepare an environmental impact statement.

Environmental Assessment

Identification of Proposed Amendments

Currently, the maximum permitted enrichment limit for (1) stored new and spent fuel and (2) fuel in the reactor core at Calvert Cliffs Units 1 and 2 is 4.1 weight percent U-235. The licensee is in the process of shifting its core design to incorporate higher enrichment fuel

assemblies to support full 24-month operating cycles. The first Unit 1 24-month cycle commenced in Spring 1988, with a reload planned for April 1990, while the first Unit 2 24-month cycle is nearing its March 1989 completion date. These first 24-month cycle cores were transitional designs provided to economically utilize the lower enrichment fuel (4.0 to 4.85 weight percent U-235) located onsite that had already experience irradiation and burnup during the previous 18-month cycles at each unit. Subsequent to the use of this lower enrichment fuel, the licensee intends to utilize cores with up to 5.0 weight percent U-235 enrichment levels to better support 24 months of continuous power operation without refueling. Consequently, the licensee has proposed changes to increase the U-235 enrichment limits in TS 5.6.1, "Criticality-Spent Fuel," and TS 5.6.2, "Criticality-New Fuel," from 4.1 to 5.0 weight percent.

In addition, the licensee has proposed to restrict the maximum value of K_{eff} to a limit of 0.95, vice the current limit of 0.98, and add the full flood condition to the various densities of unborated water conditions that are assumed in determining K_{eff} . The reduction of the maximum limit for K_{eff} for fully flooded conditions was proposed solely to place the Calvert Cliffs TS limits on new fuel criticality in full accord with the NRC guidance provided in Section 9.1.1., "New Fuel Storage," of the Standard Review Plan (NUREG-0800). This restrictive change would provide more conservative criticality determinations for new fuel storage than those currently required by TS.

Need for the Proposed Amendments

The proposed changes are needed to allow the licensee to support future 24-month full power operating cycles.

Environmental Impact of the Proposed Amendments

The Commission has completed its evaluation of the proposed revisions to the TS and the proposed increase in the burnup limits for the fuel. The staff has concluded that such changes would not adversely affect plant safety. The proposed changes have no significant adverse effects upon the probability of any analyzed accident. The increased burnup may alter slightly the mix of fission products that could be released in the event of a serious accident but such small changes would not significantly affect the consequences of said serious accidents. In addition, no changes would result in the types or amounts of any radiological effluents

that may be released offsite. Finally, these changes would not contribute to any significant increase in individual or cumulative occupational radiation exposure.

Regarding the potential non-radiological impact of reactor operation with higher enrichment fuel and increased levels of irradiation, the proposed changes involve systems located within the restricted area, as defined in 10 CFR Part 20. They do not affect non-radiological plant effluents and have no other non-radiological environmental impact.

The potential environmental impact resulting from the transportation of higher fuel enrichment and burnup levels is discussed in the staff assessment entitled, "NRC Assessment of the Environmental Effects of Extended Fuel Enrichment and Irradiation," which was published in the *Federal Register* on August 11, 1988 (53 FR 30355) in connection with the Shearon Harris Nuclear Power Plant, Unit 1, Environmental Assessment and Finding of No Significant Impact. As indicated therein, the environmental cost contribution of the transportation, due to the increases in the fuel enrichment up to 5% and irradiation limits up to 60,000 MWD/MT are either unchanged or may, in fact, be reduced from those summarized in Table S-4 as set forth in 10 CFR 51.52(c). These findings are applicable to these amendments for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2.

Therefore, the Commission concludes that the proposed amendments pose no significant radiological or non-radiological environmental impact.

Alternatives to the Proposed Amendments

Since the Commission concluded that there are no significant environmental effects that would result from the proposed changes, any alternatives with equal or greater environmental impacts need not be evaluated.

The principal alternative would be to deny the requested fuel enrichment and burnup increases. This would not reduce environmental impact of plant operation and would result in reduced operational flexibility.

Alternative Use of Resources

This action does not involve the use of any resources not previously considered in the "Final Environmental Statement Related to the Operation of Calvert Cliffs Nuclear Power Plant, Units 1 and 2," dated April 1973.

Agencies and Persons Consulted

The NRC staff reviewed the licensee's request and did not consult with other agencies or persons.

Finding of No Significant Impact

Based upon the foregoing environmental assessment, we conclude that the proposed amendments will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see (1) the application for license amendments dated June 9, 1988, as supplemented on October 25 and November 17, 1988, and (2) the licensee's letter of December 28, 1988, which are available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC and at the Calvert County Library, Prince Frederick, Maryland.

Dated at Rockville, Maryland, this 25th day of January 1989.

For the Nuclear Regulatory Commission,
Joseph D. Neighbors,

*Acting Director, Project Directorate I-1,
Division of Reactor Projects I/II, Office of
Nuclear Reactor Regulation.*

[FR Doc. 89-2077 Filed 1-27-89; 8:45 am]

BILLING CODE 7590-01-M

Receipt of U.S. Department of Energy's Site Characterization Plan for Yucca Mountain, Nevada Site

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Notice of receipt of the Department of Energy's Site Characterization Plan for Yucca Mountain, Nevada Site.

SUMMARY: The Nuclear Regulatory Commission (NRC) has received for review and comment the Department of Energy's (DOE) Site Characterization Plan (SCP) for the Yucca Mountain, Nevada candidate site for a permanent geologic repository for high-level radioactive waste (HLW). Section 113(b) of the Nuclear Waste Policy Act of 1982 (NWPA) requires that the SCP provide "a general plan for site characterization activities" to be conducted. The purpose of site characterization is to collect pertinent geological and other information necessary to evaluate whether the site is suitable for a permanent geologic repository and, if found suitable, to provide DOE with data adequate to prepare and support a license application seeking from the NRC authorization to construct such a repository.

As part of the pre-license application phase of the repository licensing process

established by NWPA and the Nuclear Waste Policy Amendments Act of 1987 (NWPA), the NRC is required to review and comment upon DOE's SCP, and in accord with 10 CFR 60.16, "DOE shall defer the sinking of such shafts until such time as there has been an opportunity for Commission comments thereon to have been solicited and considered by DOE." NRC anticipates completion of the review in a seven-month timeframe, culminating in issuance to DOE of a Site Characterization Analysis (SCA) with respect to the SCP, as well as such additional comments as may be warranted.

During its review of the SCP, the NRC will provide an opportunity for the State of Nevada and for affected local governments and Indian Tribes to present their views on the SCP and their suggestions with respect to comments thereon which may be made by the NRC. In addition, NRC staff will be made available to consult with the affected parties upon their written request pursuant to Subpart C of 10 CFR Part 60.

At the time of issuance of the SCA, a notice of availability of the SCA and a request for public comment will be published in the *Federal Register*. Copies of the SCA and of the comments received will be made available at NRC's Public Document Room (PDR) located at 2120 L Street, NW., Lower Level, Washington, DC 20555 and local Public Document Rooms (LPDRs), located at the James R. Dickinson Library, Special Collections Department, University of Nevada-Las Vegas, 4505 Maryland Parkway, Las Vegas, Nevada 89154 and University Library, Government Publications Department, University of Nevada-Reno, Reno, Nevada 89557.

Copies of the SCP may be obtained from DOE by contacting: Stephen H. Kale, Associate Director, Office of Facilities Siting and Development, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, RW-20, 1000 Independence Avenue, SW., Washington, DC 20585 or Carl P. Gertz, Project Manager, Yucca Mountain Project Office, U.S. Department of Energy, Box 98518, Las Vegas, Nevada 89193-8518.

NRC has made copies of the SCP available for public inspection in its PDR and LPDRs.

FOR FURTHER INFORMATION CONTACT: John J. Linehan, Director, Repository Licensing and Quality Assurance Project Directorate, Division of High-Level Waste Management, Office of Nuclear Material Safety and Safeguards, U.S.

Title: Challenge III Grant Application Guidelines for FY 1990.

Frequency of Collection: One-time.

Respondents: State or local governments; Non-profit institutions.

Use: Guideline instructions and applications elicit relevant information from non-profit organizations and State and local arts agencies that apply for funding under specific Challenge III program categories. This information is necessary for the accurate, fair and thorough consideration of competing proposals in the peer review process.

Estimated Number of Respondents: 150.

Average Burden Hours per Response: 80.

Total Estimated Burden: 12,000.

Murray R. Welsh,

Director, Administrative Services Division,
National Endowment for the Arts.

[FR Doc. 88-18157 Filed 8-10-88; 8:45 am]

BILLING CODE 7537-01-M

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-400]

Carolina Power & Light Co., et al.,
Shearon Harris Nuclear Power Plant,
Unit 1; Environmental Assessment and
Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is considering issuance of an amendment to Facility Operating License No. NPF-63 to the Carolina Power & Light Company (CP&L or the licensee), for the Shearon Harris Nuclear Power Plant, Unit 1, located in Wake and Chatham Counties, North Carolina.

Environmental Assessment

Identification of Proposed Action

The proposed amendment would revise the provisions in the Technical Specifications (TS) relating to fuel enrichment.

The proposed action is in accordance with the licensee's applications dated February 1 and February 8, 1988, and previous submittals dated May 28, and November 2, 1987.

The Need for the Proposed Action

The proposed changes are needed so that the licensee can use higher enrichment fuel, and provides the flexibility of extending the fuel irradiation and permitting operation of longer fuel cycles.

Environmental Impacts of the Proposed Action

The Commission has completed its evaluation of the proposed revisions to the Technical Specifications. The proposed revisions would permit use of fuel enriched with Uranium 235 in excess of 4 weight percent and up to 4.2 weight percent and the license would expect the fuel to be irradiated to levels above 33 gigawatt days per metric ton (GWD/MT) but not to exceed 60 GWD/MT. The safety considerations associated with reactor operation with higher enrichment and extended irradiation have been evaluated by the NRC staff. The staff has concluded that such changes would not adversely affect plant safety. The proposed changes have no adverse effect on the probability of any accident. The increased burnup may slightly change the mix of fission products that might be released in the event of a serious accident but such small changes would not significantly affect the consequences of serious accidents. No changes are being made in the types or amounts of any radiological effluents that may be released offsite. There is no significant increase in the allowable individual or cumulative occupational radiation exposure.

With regard to potential nonradiological impacts of reactor operation with higher enrichment and extended irradiation, the proposed changes to the TS involve systems located within the restricted area, as defined in 10 CFR Part 20. They do not affect nonradiological plant effluents and have no other environmental impact.

The environmental impacts of transportation resulting from the use of higher enrichment fuel and extended irradiation are discussed in the attached staff assessment entitled, "NRC Assessment of the Environmental Effects of Transportation Resulting from Extended Fuel Enrichment and Irradiation," dated July 7, 1988. As indicated therein, the environmental cost contribution of the proposed increase in the fuel enrichment and irradiation limits are either unchanged or may in fact be reduced from those summarized in Table S-4 as set forth in 10 CFR 51.52(c).

Therefore, the Commission concludes that there are no significant radiological or nonradiological environmental impacts associated with the proposed amendment.

Alternative to the Proposed Action

Since the Commission concluded that there are no significant environmental effects that would result from the

proposed action, any alternatives with equal or greater environmental impacts need not be evaluated.

The principal alternative would be to deny the requested amendment. This would not reduce environmental impacts of plant operation and would result in reduced operational flexibility.

Alternative Use of Resources

This action does not involve the use of any resources not previously considered in the "Final Environmental Statement related to the operation of the Shearon Harris Nuclear Power Plant, Units 1 and 2," dated October 1983.

Agencies and Persons Consulted

The NRC staff reviewed the licensee's request and did not consult other agencies or persons.

Finding of No Significant Impact

The Commission has determined not to prepare an environmental impact statement for the proposed license amendment.

Based upon the foregoing environmental assessment, we concluded that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the application for amendment dated February 1, and February 8, 1988, and submittals May 28 and November 2, 1987, which are available for public inspection at the Commission's Public Document Room, 1717 H Street NW., Washington, DC and at the Richard B. Harrison Library, 1313 New Bern Avenue, Raleigh, North Carolina 27610.

Dated at Rockville, Maryland, this 3rd day of August 1988.

For the Nuclear Regulatory Commission,
Edward A. Reeves,
Acting Director, Project Directorate II-1,
Division of Reactor Projects I/II, Office of
Nuclear Reactor Regulation.

NRC Assessment of the Environmental Effects of Transportation Resulting From Extended Fuel Enrichment and Irradiation

Introduction

Several Licensees of light water reactors (LWRs) have submitted proposed license amendments to permit use of enriched fuel in excess of four (4) weight-percent uranium-235 and to extend fuel irradiation from the current limit of 33 Gigawatt Days/Metric Ton (GWD/MT) up to 60 GWD/MT. It is anticipated that, in time, almost all licensees of light water reactors will request approval to adopt increases in

irradiation levels and fuel enrichment. Paragraph (b) of 10 CFR 51.52 states, among other things, that the reactors using fuel enrichment greater than 4 weight-percent uranium-235 or where fuel irradiation exceeds 33 GWD/MT, the licensee shall provide a full description and detailed analysis of the environmental effects to transportation of fuel and wastes to and from the reactor, including values for the environmental impact under normal conditions of transport and for the environmental risk from accidents in transport. The Statement shall indicate that the values determined by the analysis represent the contribution of such effects to the environmental costs of licensing the reactor.

With respect to the issue, the staff published a Notice of Environmental Assessment and Finding of No Significant Impact for extended burnup fuel use in Commercial LWRs in the Federal Register (53 FR 6040), dated February 29, 1988. In the above cited notice, the staff concluded that the environmental impacts summarized in Table S-4 of 10 CFR 51.52 for the burnup level of 33 GWD/MT are conservative and bound the corresponding impacts for burnup level up to 60 GWD/MT and uranium-235 enrichments up to five percent by weight. The staff also concluded that there are no significant adverse radiological or non-radiological impacts associated with the use of extended fuel burnup and/or increased enrichment, and that this use will not

significantly affect the quality of the human environment. Moreover, pursuant to 10 CFR 51.31, the Commission determined that an environmental impact statement need not be prepared for this action.

The Staff is in the process of revising the regulations at 10 CFR 51.52 to reflect the findings published in the above cited Federal Register Notice. In the interim, in connection with its review of proposed license amendments to permit use of fuel enriched with uranium 235 in excess of 4 percent and up to 5 percent by weight and irradiated to levels above 33 GWD/MT and up to 60 GWD/MT, and pursuant to 10 CFR 51.52(b), the staff proposes to accept the following analysis of the environmental effects of the transportation of such fuel and waste until such time as the revision to the rule is issued.

Environmental Impacts of Transportation

In evaluating the environmental impacts of the use of extended irradiation of high enrichment fuel, the Commission has relied upon the following four studies dealing with the transportation impacts:

- (1) Pacific Northwest Laboratories' report NUREG/CR-5009, "Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors," dated February 1988, prepared for the Nuclear Regulatory Commission;
- (2) Nuclear Regulatory Commission's report WASH-1238, "Environmental

Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants, dated December 1972;

(3) EnviroSphere Company Report AIF/NE SP-032, "The Environmental Consequences of Higher Fuel Burnup," dated June 1985, prepared for National Environmental Studies Project (NESP) and the Atomic Industrial Forum, Inc., with the participation of the Commission's staff; and

(4) Sandia National Laboratories (SNL) Draft Report NUREG/CR-2325, "The Transportation of Radiative Material (RAM) To and From U.S. Nuclear Power Plants," dated December 1983.

All four studies present the results of evaluation of transportation impacts for postulated traffic models. The results are presented for traffic density, radiological occupational risks, radiological public risks of normal transportation, and risks of transportation accidents. The Pacific Northwest Laboratories (PNL) report and the EnviroSphere Company report present the environmental impacts for fuel irradiation levels extending up to 60 GWD/MT and enrichments up to 5 weight percent uranium-235. The PNL results appear to have been derived from the analysis presented in the NESP report.

Table I summarizes the results of traffic densities for transportation of fresh fuel, spent fuel, and other solid waste by truck, rail and barge used in the four studies.

TABLE I.—TRAFFIC DENSITIES SHIPMENTS PER REACTOR YEAR

Transportation mode	NUREG/CR-5009 (PNL)		NESP-032		WASH-1238	SNL ¹
	33 GWD/MT	60 GWD/MT	33 GWD/MT	60 GWD/MT	33 GWD/MT	33 GWD/MT
TRUCK	112	92	112	92	112	122
RAIL	10	6	10	6	10	2.3
BARGE	5	3	5	3		

¹ The report does not clearly state the assumptions regarding fuel enrichment and irradiation levels. However, since Table S-4 in 10 CFR 51.52 is based on 33 GWD/MT, the staff has assumed that SNL analysis must be based on the assumptions contained in 10 CFR 51.52, Table S-4.

The comparison of the results of traffic density analysis shows that there is a reasonable good correlation between the total number of shipments shown in SNL results and that shown in other reports for 33 GWD/MT. Both the PNL study and the NESP study show that there will be a reduction in the total number of shipments (fresh fuel, spent fuel, and low level wastes) when higher levels of irradiation (60 GWD/MT) are assumed. Such high irradiation levels may require that fuel enrichment be increased up to a maximum of 5 weight

percent. The reduction in the shipments is due to the fact that there will be fewer outages for fuel reloads resulting in reduced fuel shipments to the reactor and reduced spent fuel shipments from the reactor. However, there will be an increase in the shipment of low level solid wastes. Even when this increase in low level waste shipment is included with the shipment of fresh fuel and spent fuel, the total shipments for higher irradiation (60 GWD/MT) are still somewhat reduced from those at 33 GWD/MT. As a result of the reduction

in number of shipments, there should be some reduction in the estimated number of persons exposed. There should also be no significant change in heat generated per irradiated fuel cask and the weight restriction for transporting vehicle.

The discharged spent fuel at higher irradiation (60 GWD/MT) will have more long lived radionuclides per unit mass compared with the spent fuel irradiated at 30 GWD/MT. However, there is a smaller amount of annual spent fuel discharged. Since each spent

fuel package will meet the surface radiation level limits imposed by the transportation regulations and there are fewer packages being shipped, there will be an overall reduction in the impacts of normal transportation of spent fuel at higher irradiation levels. However, the normal transportation impacts of low level wastes will increase with increased irradiation level. This is due

to the fact that slight increases in cooling water activity could occur through increased inventory and gap release fraction. Because this activity would need to be removed to keep cooling water activity within licensed technical specification limits, a small increase in the quantity of low level wastes is estimated to occur. Both NUREG/CR-5009 and NESP-0032

conservatively assume a 20% increase in solid waste at 60 GWD/MT irradiation. Table II summarizes the combined environmental impacts of normal transportation of spent fuel, low level waste and new fuel activities at 33 GWD/MT and 60 GWD/MT as presented in NUREG/CR-5009 and NESP-032.

TABLE II.—NORMAL TRANSPORTATION RADIOLOGICAL EXPOSURE RISK PERSON REM/REACTOR YEAR

Exposure type	NUREG/CR-5009 (PLN)		NESP-032	
	33 GWD/MT	60 GWD/MT	33 GWD/MT	60 GWD/MT
Occupational	4.2 ¹	3	4.2	3
General Public	3.2 ¹	2.5	3.2	2.0
Total (Normal Transportation Exposures)	7.4	5.5	7.4	5.0

¹ These values are identical to the rounded off values reported in Table S-4 of 10 CFR 51.52, and form the basis of the Commission's determination of no significant adverse environmental impacts of transportation of fuel and wastes to and from nuclear reactor sites.

The above results show that there is in fact an overall reduction in the radiological impacts of normal transportation (the calculated impacts are lower than the values reported in Table S-4).

Environmental impacts also result from transportation accidents. The extended irradiation of fuel will result in an increase in the actinide and fission product inventory in the fuel. Since the spent fuel in transported after an extended storage at the site (5 years), only the long lived fission products and actinides would remain to contribute to the risk. The PLN analysis shows that the overall effect of a higher inventory of actinides and long lived fission products would be to increase the projected dose in the event of an accident involving spent fuel by a factor of about 2.7, when irradiation is increased from 33 GWD/MT to 60 GWD/MT. However, because the increased irradiation will correspondingly decrease the amount of the spent fuel discharged, the probability of a transportation accident will be reduced by an amount roughly

equal to the ratio of irradiation levels. The overall effect of the increase in irradiation to 60 GWD/MT would be to increase the radiological risk of spent fuel transportation accidents by about 50%.

As stated earlier, the amount of low level waste is conservatively assumed to increase by about 20% when irradiation levels are increased to 60 GWD/MT. No significant change in composition of low level wastes is expected. Therefore, the transportation accident risks of low level waste shipment would increase by 20%. The transportation risk associated with new fuel shipments would decrease as shipments decreased due to extended burnup.

Although Table S-4 indicates that the radiological risk of accidents is small and not capable of quantification, the radiological risks of transportation accidents were calculated in NUREG/CR-2325. For the 1985 transportation model, the SNL calculated radiological risk of 1.8 person-rem/reactor year. The staff has conservatively assumed from the PLN analyses that the higher

irradiation (60 GWD/MT) would result in a 50 percent increase in radiological risks due to transportation of all kinds of radioactive waste (even though for low level waste the increase in expected to be 20% or less and for new fuel the risk would decrease with the assumption). SNL calculated risk of 1.8 person-rem/reactor year could increase to 2.7 person-rem/reactor year at 60 GWD/MT irradiation level. When accident risks at 33 GWD/MT (SNL value) and 60 GWD/MT (Scaled SNL value) are added to normal impacts (PLN and NESP-032 value in Table II), the overall radiological risks at higher irradiation levels are still lower than the risks at 33 GWD/MT irradiation levels. This is shown on Table III.

The analyses presented in NESP-032 show that the radiological environmental impacts of transportation accidents are small at 33 GWD/MT and remain small at 60 GWD/MT. The NESP-032 finding is consistent with finding in WASH-1233 and the results summarized in Table S-4 of 10 CFR 51.52.

TABLE III.—TRANSPORTATION RADIOLOGICAL EXPOSURE RISK PERSON REM/REACTOR YEAR

	NUREG/CR-5009 (PLN)		NESP-032	
	33 GWD/MT	60 GWD/MT	33 GWD/MT	60 GWD/MT
Normal Transportation Exposures	7.4	5.5	7.4	5.0
Accident Exposures (from SNL)	1.8	2.7	1.8	2.7
	9.2	8.2	9.2	7.7

The non-radiological impacts of transportation accidents are presented in Table S-4 as follows:

- (a) 1 fatality in 100 reactor years.
- (b) 1 non-fatal injury in 10 reactor years.
- (c) \$475 property damage per reactor year.

As seen in Table 1, the overall shipments of fresh fuel, spent fuel, and low level waste are slightly reduced. Therefore, the likelihood of an accident would decrease with the decreased number of shipments, while the non-radiological consequences of transportation accidents would remain unchanged.

In summary, the environmental impacts of extended irradiation up to 60 GWD/MT and increased enrichment up to 5 weight percent are bounded by the impacts reported in Table S-4 of 10 CFR Part 51. Table IV shows the summary of the comparison of impacts. Table IV also supports the staff's conclusions concerning transportation impacts in the Federal Register Notice 53 FR 6040.

TABLE IV.—SUMMARY COMPARISON OF TRANSPORTATION IMPACTS

	Table S-4	60 GWD/MT and up to 5 percent enrichment
Traffic Density		
Truck.....	Less than 1 per day.	No increase.
Rail.....	Less than 3 per month.	No increase.
Radiological Risk—Person REM per year:		
Normal	7.....	5.0-5.5
Transportation		
Accidents.....	1.8.....	2.7
Total.....	8.8.....	7.7-8.2
Non-Radiological Risk		
1 Fatality/100 Reactor Years.		No increase.
1 Non-Fatal Injury/10 Reactor Years.		No increase.
\$475 Property Damage/Reactor Year.		No increase.

The above evaluation sets forth the changes resulting from increased enrichment (up to 5 weight percent) and extended irradiation (up to 60 GWD/MT), in the environmental impacts of transportation of fuel and wastes to and from the light water reactors set forth in

Table S-4, 10 CFR Part 51. The values set forth in this detailed analysis represent the contribution of the environmental effects of transportation of fuel enriched with uranium 235 above 4 weight percent and up to 5 weight percent, and irradiated to levels above 33 GWD/MT and up to 60 GWD/MT to the environmental costs of operating the reactors. As shown above, the environmental cost contributions of the stated increases in fuel enrichment and irradiation limits are either unchanged or may in fact be reduced from those summarized in Table S-4, as set out in 10 CFR 51.52(c).

Dated: July 7, 1988.

(FR Doc. 8-18175 Filed 8-10-88; 8:45 am)

BILLING CODE 7590-01-M

[Docket No. 50-341]

Detroit Edison Co., Wolverine Power Supply Cooperative, Inc.; Environmental Assessment and Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. NPF-43, issued to the Detroit Edison Company (DECo) and the Wolverine Power Supply Cooperative, Incorporated (the licensees) for the operation of Fermi-2 located in Monroe County, Michigan.

Environmental Assessment

Identification of Proposed Action

The Proposed amendment would revise provisions in the Fermi-2 Technical Specifications (TSs) relating to the Standby Gas Treatment System (SGTS) Radiation Monitors and the Containment High Range Radiation Monitor.

The Need for the Proposed Action

The proposed changes to the TSs are required in order to remove the potential for an unmonitored release for fission products from the plant and to revise Action Statement 81 to make it consistent with NRC Generic Letter 63-36.

Environmental Impacts of the Proposed Action

The Commission has completed its evaluation of the proposed revision to the TSs. The proposed revision would require a minimum of two channels, instead of one, of the SGTS Radiation Monitors to be operable to ensure that appropriate compensatory actions are taken to preclude conditions which have

the potential for allowing unmonitored releases of noble gases. In addition, the proposed amendment would (1) revise the associated Action Statement 81 in Table 3.3.7.5-1 for the SGTS Radiation Monitors and Containment High Range Radiation Monitor to extend the time period before the licensees are required to submit a Special Report to the Commission (pursuant to 6.9.2 of the TSs) as recommended by NRC Generic Letter 83-36; and (2) make appropriate changes in the TS Bases for Accident Monitoring Instrumentation as a result of the changes. Therefore, the proposed changes do not increase the probability or consequences of any accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupational radiation exposure. Accordingly, the Commission concludes that this proposed action would result in no significant radiological impact and could result in the reduction of the radiological impacts.

With regard to potential nonradiological impacts, the proposed changes to the TSs involve systems located within the restricted area as defined in 10 CFR Part 20. They do not affect nonradiological plant effluents and have no other environmental impact. Therefore, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed amendment.

The Notice of Consideration of Issuance of Amendment and Opportunity for Hearing in connection with this action was published in the Federal Register on March 10, 1988 (53 FR 7819). No request for hearing or petition for leave to intervene was filed following this notice.

Alternatives to the Proposed Action

Because the Commission has concluded that there is no significant environmental impact associated with the proposed amendment, any alternative would have either no or greater environmental impact. The principal alternative would be to deny the requested amendment. This may increase the environmental impacts attributed to the facility due to allowing the potential for unmonitored releases from the facility.

Alternative Use of Resources

This action involves no use of resources not previously considered in connection with the "Final Environmental Statement Related to

Assistant Attorney General, Land and Natural Resources Division, Department of Justice, Washington, DC 20530, and should refer to *United States v. B & R Insulation, Inc., and FMC Corporation*, D.J. Ref. 90-5-2-1-1113.

The proposed consent decree may be examined at the office of the United States Attorney, District of Kansas, 412 Federal Building, 812 North Seventh Street, Kansas City, Kansas 66601, and at the Region VII office of the Environmental Protection Agency, Office of Regional Counsel, Attention: Becky Ingram Dolph, 726 Minnesota Avenue, Kansas City, Kansas 66101. A copy of the proposed consent decree may also be examined at the Environmental Enforcement Section, Land and Natural Resources Division, Department of Justice, Room 1521, Ninth Street and Pennsylvania Avenue NW., Washington, DC 20530. A copy of the proposed consent decree may be obtained in person or by mail from the Environmental Enforcement Section, Land and Natural Resources Division, Department of Justice.

Roger J. Marzulla,

Acting Assistant Attorney General Land and Natural Resources Division, U.S. Department of Justice, 10th and Pennsylvania Avenue NW., Washington, DC 20530.

[FR Doc. 88-4223 Filed 2-26-88; 8:45 am]

BILLING CODE 4410-01-M

NUCLEAR REGULATORY COMMISSION

Availability of Draft Generic Technical Position on "Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events"

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of availability.

SUMMARY: The Nuclear Regulatory Commission (NRC) is announcing the availability of the "Draft Generic Technical Position on Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events."

DATE: The comment period expires April 29, 1988.

ADDRESSES: Send comments to Ronald L. Ballard, Chief, Technical Review Branch, Division of High-Level Waste Management, U.S. Nuclear Regulatory Commission, Mail Stop 1WFN 4-H-3, Washington, DC 20555. Copies of this document may be obtained free of charge upon written request to Cathy Jensen, Technical Review Branch, Division of High-Level Waste

Management, U.S. Nuclear Regulatory Commission, Mail Stop 1WFN 4-H-3, Washington, DC 20555, Telephone (301) 492-3455.

FOR FURTHER INFORMATION CONTACT: John Trapp, Technical Review Branch, Division of High-Level Waste Management, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Mail Stop 1WFN 4-H-3, Telephone (301) 492-0509.

SUPPLEMENTARY INFORMATION: The Nuclear Waste Policy Act of 1982 (Pub. L. 97-425) and the Commission regulation 10 CFR Part 60 provide for interactions between the Department of Energy (DOE) and NRC prior to submittal of a license application for a geologic repository. These interactions serve to inform DOE about the information that the NRC staff considers to be necessary in such a license application.

An important mechanism for providing guidance to the DOE is the NRC comments on DOE's Site Characterization Plan, as required by the Nuclear Waste Policy Act. Under 10 CFR Part 60, this takes the form of a Site Characterization Analysis (SCA). Other means of providing guidance to supplement the SCA are staff technical positions on both generic and site-specific issues. Generic Technical Positions (GTP) establish the staff's position on broad technical issues that are applicable to any site; Technical Positions establish the staff's position on a site-specific technical issue. A number of technical positions will be developed by the staff on both generic and site-specific issues. This announcement notices availability and solicits comments on the "Draft Generic Technical Position on Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events."

The purpose of this GTP is to provide guidance concerning the methodologies the NRC staff proposes to utilize in evaluating processes and events which could occur after closure of a high-level radioactive waste repository so that, after significant processes and events have been determined, they can be categorized into anticipated processes and events and unanticipated processes and events. The significance of differentiating between anticipated processes and events and unanticipated processes and events relates to the post-closure performance requirements imposed by the regulations. In particular, for those processes and events categorized as "anticipated," the engineered barrier system must meet the numerical design requirements set forth

in 10 CFR 60.113. To conform with the applicable environmental standards as expected to be set forth by the Environmental Protection Agency in 40 CFR Part 191 and implemented in 10 CFR 60.112, consideration must be given to both "anticipated" and "unanticipated" processes and events, including potential human intrusion, to assure that the likelihood of exceeding the EPA environmental standards under these circumstances is low. In arriving at a determination of reasonable assurance that overall performance objectives can be met, additional regulatory requirements may be found to be necessary as they relate to unanticipated processes and events.

In this GTP, the staff provides a basis for categorizing natural processes and events that could occur in the post-closure period into anticipated processes and events and unanticipated processes and events. In addition, the staff provides its view on how human processes and events and repository-induced modifications should be included in the evaluation.

The staff is interested in receiving comments on the utility and practicality of the categorization procedures and potential impacts this draft position would have on the design and analysis required for a high-level waste geologic repository.

Dated at Rockville, Maryland this 22nd day of February, 1988.

For the Nuclear Regulatory Commission.

Ronald L. Ballard,

Chief, Technical Review Branch, Division of High-Level Waste Management, Office of Nuclear Material Safety and Safeguards.

[FR Doc. 88-4230 Filed 2-26-88; 8:45 am]

BILLING CODE 7590-01-M

Extended Burnup Fuel Use in Commercial LWRs; Environmental Assessment and Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission is considering whether or not a generic environmental impact statement (GEIS) is necessary in regard to the anticipated widespread use of extended burnup fuel¹ in commercial light water power reactors (LWRs).

¹ The length of use, or total energy generated, or "burnup" of fuel in a reactor is measured in terms of megawatt days per metric ton of uranium (Mwd/MtU) or Gwd/MtU where 1 Gwd/MtU = 1000 Mwd/MtU. Typically, fuel has been removed from reactors after 3 to 5 years with burnup levels of 28 Gwd/MtU for boiling water reactors and 33 Gwd/MtU for pressurized water reactors. "High" or "Extended" burnup nuclear fuel is considered, for the purpose of this discussion, to be fuel that is left

Continued

Environmental Assessment

Identification of Proposed Action

No specific licensing action is being identified regarding use of extended burnup fuel in LWRs; however, there have been various requests for the use of extended burnup fuel that have been treated by the Commission on a case-by-case basis. The proposed action being considered by this environmental assessment (EA) is the widespread licensing for use of extended burnup nuclear fuel in commercial LWRs.

The Need for the Proposed Action

There has been an increasing number of applications from licensees in the nuclear industry for license amendments permitting incremental increases in the burnup of fuel. The usage has been cautious at first, but if the fuel continues to perform satisfactorily and if the current economic parameters remain constant, the use of extended burnup fuel is expected to continue. Within the next 10 to 12 years most licensees will probably plan for burnups of 45 Gwd/MtU or more, with refueling cycles of 1.5 to two years instead of the current one year cycle. In view of this trend, it is prudent and timely to evaluate the environmental significance of the potential widespread use of extended burnup fuel and to determine whether a detailed environmental impact statement (EIS) is warranted. The environmental evaluation will also consider the impact on Tables S-3 and S-4 of 10 CFR 51.51 and 51.52, respectively, to determine their applicability for extended burnup fuel.

Environmental Impacts of the Proposed Action

In evaluating the environmental impacts of the use of extended burnup fuel, the Commission relied upon the results of a study conducted for it by Pacific Northwest Laboratories (PNL). The results of the study have been documented in detail in the report entitled, "Assessment of the Use of Extended Burnup Fuels in Light Water Power Reactors," (NUREG/CR-5009, PNL-6258). The overall findings of this study are that no significant adverse effects will be generated by increasing the present batch-average burnup level of 33 Gwd/MtU to 50 Gwd/MtU or above as long as the maximum rod average burnup level of any fuel rod is no greater than 60 Gwd/MtU. Furthermore, based on the above study and the report entitled, "The

Environmental Consequences of Higher Fuel Burn-up," (AIF/NESP-032), the NRC staff concludes that the environmental impacts summarized in Table S-3 of 10 CFR 51.51 and in Table S-4 of 10 CFR 51.52 for a burnup level of 33 Gwd/MtU are conservative and bound the corresponding impacts for burnup levels up to 60 Gwd/MtU and uranium-235 enrichments up to 5 percent by weight.

Extensive studies of extended burnup fuels have been conducted under the direction of the U.S. Department of Energy (DOE) and the Electric Power Research Institute (EPRI), with the participation of the fuel vendors nationwide and with the cooperation of several nuclear reactor utilities (see pgs. 1-7 to 1-10 of above mentioned NUREG/CR-5009). These studies have shown that there is no loss in fuel integrity for rod average burnups reaching 60 Gwd/MtU (the maximum level tested), as long as power levels (rate of heat generation) and operating temperatures for the fuel rods remain normal. Activity inventory may increase for long-lived radionuclides of concern; however, for short-lived fission products, the inventories will essentially remain the same. Of the longer lived fission products of concern, only cesium-134, cesium-137, and strontium-90 increase significantly with extended burnup (by factors of 2.5, 1.9, and 1.6, and respectively). The neutron emission rate from transuranic isotopes will increase with extended burnup by a factor of 5.6. At current power levels, the fractions of volatile fission products released into the gap between the fuel and the fuel cladding may increase by a factor of two, but will remain below NRC accident analysis assumptions for noble gases and iodines.

During the study, all aspects of the fuel-cycle were considered; from mining, milling, conversion, enrichment and fabrication through normal reactor operation, transportation, decommissioning, waste disposal and reprocessing. If leakage of radionuclides from a fuel element occurs during operation, the radioactivity is expected to be removed by the plant cooling-water cleanup system. No change in the licensed technical specifications pertaining to allowed cooling-water activity concentrations would be necessary. Thus, with extended burnup, little or no increase in the release of radionuclides to the environment is expected during normal operation. Other parts of the fuel cycle would also not be adversely affected by changing to an extended burnup fuel utilization plan. The impacts on workers and the general

population would actually be reduced because at higher burnups, outages for fuel changes will be less frequent, and fuel shipments to and from the reactor sites would be reduced, thus reducing exposure. Although the inventory of long-lived radionuclides in the spent fuel will increase, the amount of spent fuel removed from reactors each year will decrease. In summary, for all aspects considered, except those involving low-level wastes, the radiological impacts were either unchanged or reduced when changing from normal to extended burnup fuel. The low level wastes include various solids collected from the spent fuel storage pool circulating water and reactor cooling water. There would be an increase in the radioactivity of the solids collected from the reactor cooling water as a result of increased fission product inventory and gap-release fraction. The greater activity resulting from the increases in fission product inventory and gap-release fraction, as much as a factor of two, would need to be removed from the reactor cooling water to meet the technical specifications. Overall, there would be less than a 20 percent increase in the radioactivity of the low-level waste.

Accidents that involve the damage or melting of the fuel in the reactor core and spent-fuel handling accidents were also reviewed. It should be noted that since the fuel rod integrity has been shown to be unaffected by the extended burnups considered, the probability of an accident will not be affected. For accidents in which the core remains intact, the release would involve only volatile fission products, and no increase in impacts will occur since the radionuclides contributing most to the dose are short lived and thus do not increase with burnup. For larger (severe) accidents, i.e., those in which an appreciable amount or all of the fuel has melted and fission products and aerosols have been released from the containment system into the biosphere, only a few fission products and the actinides will increase in inventory with extended burnup. The fission products would increase by no more than a factor of two, and the actinides by no more than a factor of six (of those contributing to the dose). However, since these actinides have very small release fractions and biotransfer factors, the risks associated with the actinides would be insignificant compared to those associated with fission products such as cesium-137 and strontium-90. Therefore, the overall accident risk is increased by only a factor of two when changing from 33 Gwd/MtU to 60 Gwd/MtU.

¹ in a reactor long enough to achieve a burnup of greater than 40 Gwd/MtU. Burnup levels of up to about 60 Gwd/MtU are being considered.

For the fuel-handling accident, only the noble gases and iodines escaping the damaged cladding are of significance in the assessment of dose impacts to the population. For a peak rod of an extended burnup fuel design at a burnup level of 60 Gwd/MtU, the release fractions increase by factors of three to four for these radionuclides; however, they remain below those assumed in Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," with the exception of iodine-131. Note that there is not expected to be any increase in fuel clad perforations. Because the calculated iodine-131 gap-release fraction is 20 percent greater than the Regulatory Guide 1.25 assumed value of 0.10, the calculated thyroid doses resulting from a fuel-handling accident with extended burnup fuel could be 20 percent higher than estimated using the guide. To put this into perspective, it should be noted that Section 15.7.4, Revision 1, "Radiological Consequences of Fuel Handling Accidents," of the NRC's Standard Review Plan indicates that the acceptable dose to an individual "should be well within the 10 CFR Part 100 exposure guidelines of 25 rem." It is indicated that "well within means 25 percent or less than the 10 CFR Part 100 exposure guideline values." Therefore, the 20 percent possible increase in environmental risk of a fuel handling accident is insignificant in view of the staff's conservative interpretation of the dose guidelines.

Spent-fuel transportation accidents were also reviewed. Activity inventory may increase by an overall factor of about three for long-lived radionuclides of concern (assuming a 5-year cooling period) when changing to extended burnup fuel. This increase would be offset by a decrease in the number of shipments, so that the overall change related to spent-fuel transportation accidents would be a 50 percent increase in risk by changing to 60 Gwd/MtU burnup. However, the contribution of the spent-fuel transportation accidents to overall transportation risk is very small. The draft environmental assessment on "The Transportation of Radioactive Material (RAM) to and from U.S. Nuclear Power Plants" (NUREG/CR-2325 prepared by Sandia National Laboratories for the NRC in December 1983) summarizes the normal transportation and transportation accident risks. For spent-fuel transportation during sample years 1985 and 1990, the Summary (Table S-2)

shows that these accidents contribute much less than 1 percent to the overall transportation risk. Therefore, a 50 percent increase in such a small contribution will have a negligible effect on overall risk. On balance, the approximately 45 percent reduction in normal transportation impacts, due to the need for fewer fuel shipments, far outweighs the less than one percent increase in impacts associated with transportation accidents. (e.g., Assume the normal transportation impact is X and the transportation accident impact is 0.01 X. Then for extended burnup, the transportation accident impact would be increased to 0.015 X while the normal transportation impact would be reduced to 0.55 X giving a total impact of 0.565 X; a significant net reduction in overall transportation impact.)

The use of extended burnup fuel would reduce fuel requirements per unit of electricity. This translates directly into reduced requirements for the various materials and operations linked to fuel production (uranium mining, milling, conversion, separation, and fuel fabrication). The result of these reduced production requirements will be a significant reduction in cost, as well as a reduction in environmental impacts from fuel cycle operations required to support one year of reactor operation.

Although the discharged fuel at extended burnup is slightly thermally hotter, has increased neutron emission, and has more long-lived nuclides per unit mass compared to fuel that has not undergone extended burnup, the volume of fuel discharged per unit time will be reduced. Thus, although the waste contains a greater actinide and long-lived fission-product activity, there will be less of it. These opposing characteristics of the waste have an effect on all the back-end stages of the fuel cycle (at-reactor storage, transportation, and repository storage). The net result of these changes would be an increase in transportation shielding requirements, a reduction in the number of fuel shipments, smaller repository waste packages or increased spacing in the underground repository, and a reduction in future at-reactor storage requirements.

As indicated previously, no significant adverse effects were uncovered in the study. On balance, provided that applicable technical specifications and engineering and shielding requirements are adhered to, the study indicated that there should be no net increase in the environmental risk when changing from 33 to 55 Gwd/MtU batch-average burnup level. Likewise, there is no increase in the individual and collective

radiation dose to the public or occupational workers during normal operations; in fact, as the study indicated, these doses would actually be reduced. While there is an increase in doses resulting from some postulated accidents, these accidents are extremely low probability events and contribute little to overall risk. Furthermore, though there is an increase, it is generally below what has been assumed in evaluating power plant safety. In summary, the increased accident doses do not significantly affect the risk of any dominant accident scenario and the effect on the overall risk is insignificant.

Alternative to the Proposed Action

The Commission has concluded that there is no significant increase in the environmental impact associated with the proposed action. The principal alternative would be to retain a batch-average burnup level of 33 Gwd/MtU and deny licensee requests to extend the allowed burnup to higher levels. Such action would not reduce environmental impacts and, as indicated above, could result in increased overall environmental impact. In addition, it would deny to the licensees and the public the cost benefits resulting from the use of extended burnup fuel.

Agencies and Persons Consulted

The NRC staff was assisted by Pacific Northwest Laboratories in developing the information needed to perform the environmental assessment. Staff of the Department of Energy (DOE) and the National Environmental Studies Project of the Atomic Industrial Forum were also consulted with regard to results of applicable experimental and analytical studies. The NRC staff did not consult with any other agencies or persons.

Finding of No Significant Impact

The NRC staff has reviewed the anticipated widespread use of extended burnup fuel in commercial LWRs. Based upon the foregoing environmental assessment, the staff concluded that there are no significant adverse radiological or non-radiological impacts associated with the use of extended burnup fuel and that this use will not significantly affect the quality of the human environment. Therefore, pursuant to 10 CFR 51.31, the Commission has determined that an environmental impact statement need not be prepared for this action.

Copies of NUREG/CR-5009 and NUREG/CR-2325 may be purchased through the U.S. Government Printing Office by calling (202) 275-2060 or by writing to the Superintendent of

Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Copies are available for inspection or copying for a fee in the NRC Public Document Room, 1717 H Street, NW., Washington, DC.

Regulatory Guide 1.25 and Section 15.7.4 of the NRC's Standard Review Plan are available for inspection or copying for a fee in the NRC Public Document Room, 1717 H Street, NW., Washington, DC. Copies of the Regulatory Guide may be purchased by calling (202) 275-2060 or by writing to the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082.

Copies of AIF/NESP-032 may be purchased from the USCEA, Publications Office, 7101 Wisconsin Ave., Bethesda, MD 20814, telephone number (301) 654-9280.

Dated at Bethesda, Maryland, this 23rd day of February 1988.

For the Nuclear Regulatory Commission,
Eric S. Beckjord,
Director, Office of Nuclear Regulatory Research.

[FR Doc. 88-4229 Filed 2-26-88; 8:45 am]

BILLING CODE 7590-01-M

Advisory Committee on Reactor Safeguards Subcommittee on Metal Components; Meeting

The ACRS Subcommittee on Metal Components will hold a meeting on March 15, 1988, EPRI NDE Center, 1300 Harris Blvd., Charlotte, NC.

The entire meeting will be open to public attendance.

The agenda for subject meeting shall be as follows:

Tuesday, March 15, 1988—8:30 a.m. until the conclusion of business

The Subcommittee will review the status of the NDE of cast stainless steel piping and other topics related to Subcommittee activities.

Oral statements may be presented by members of the public with the concurrence of the Subcommittee Chairman; written statements will be accepted and made available to the Committee. Recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Subcommittee, its consultants, and Staff. Persons desiring to make oral statements should notify the ACRS staff member identified below

as far in advance as practicable so that appropriate arrangements can be made.

During the initial portion of the meeting, the Subcommittee, along with any of its consultants who may be present, may exchange preliminary views regarding matters to be considered during the balance of the meeting.

The Subcommittee will then hear presentations by and hold discussions with representatives of the NRC Staff, its consultants, and other interested persons regarding this review.

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by a prepaid telephone call to the cognizant ACRS staff member, Mr. Elpidio Igne (telephone 202/634-1414) between 8:15 a.m. and 5:00 p.m. Persons planning to attend this meeting are urged to contact the above named individual one or two days before the scheduled meeting to be advised of any changes in schedule, etc., which may have occurred.

Dated: February 24, 1988.

Morton W. Libarkin,

Assistant Executive Director for Project Review.

[FR Doc. 88-4282 Filed 2-26-88; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 30-13435, ASLBP No. 88-559-01-SC]

Atomic Safety and Licensing Board Panel Hearing; Finlay Testing Laboratories, Inc.

February 22, 1988.

Before Administrative Judges: Robert M. Lazo, Chairman, Glenn O. Bright, Richard F. Cole.

Order (Postponing Hearing)

Please take notice that the evidentiary hearing in this proceeding, scheduled to commence on March 9, 1988, is postponed until further notice.

Dated at Bethesda, Maryland, this 22nd day of February 1988.

It is so ordered.

For the Atomic Safety and Licensing Board.

Robert M. Lazo,

Chairman, Administrative Judge.

[FR Doc. 88-4283 Filed 2-26-88; 8:45 am]

BILLING CODE 7590-01-M

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

White House Science Council (WHSC)

The White House Science Council, the purpose of which is to advise the Director, Office of Science and Technology Policy (OSTP), will meet on March 10 and 11, 1988 in Room 5104, New Executive Office Building, Washington, DC. The meeting will begin at 6:00 p.m. on March 10, recess and reconvene at 8:00 a.m. on March 11, 1988. Following is the proposed agenda for the meeting:

- (1) Briefing of the council, by the Assistant Directors of OSTP, on the current activities of OSTP.
- (2) Briefing of the Council by OSTP personnel and personnel of other agencies on proposed, ongoing, and completed panel studies.
- (3) Discussion of composition of panels to conduct studies.

The March 10 session and a portion of the March 11 session will be closed to the public.

The briefing on some of the current activities of OSTP necessarily will involve discussion of material that is formally classified in the interest of national defense or for foreign policy reasons. This is also true for a portion of the briefing on panel studies. As well, a portion of both of these briefings will require discussion of internal personnel procedures of the Executive Office of the President and information which, if prematurely disclosed, would significantly frustrate the implementation of decisions made requiring agency action. These portions of the meeting will be closed to the public pursuant to 5 U.S.C. 552b(c) (1), (2), and (9)(B).

A portion of the discussion of panel composition will necessitate the disclosure of information of a personal nature the disclosure of which would constitute a clearly unwarranted invasion of personal privacy. Accordingly, this portion of the meeting will also be closed to the public, pursuant to 5 U.S.C. 552b(c)(6).

Because of the security in the New Executive Office Building, persons wishing to attend the open portion of the meeting should contact Barbara J. Diering, at (202) 456-7740, prior to 3:00 p.m. on March 9, 1988. Mrs. Diering is also available to provide specific

Issue: Impingement of fish and shellfish for plants with once-through and cooling pond heat dissipation systems

CHAPTER 2. ALTERNATIVES INCLUDING PROPOSED ACTION

2.1 Proposed Action

2.1.3 HEAT DISSIPATION SYSTEM

CCNPP is equipped with a once-through heat dissipation system. This circulating water system removes heat energy rejected from the plant cycle in the condensers and transfers this energy to the Chesapeake Bay via the heated effluent. As described in FES Section III.D.1, the principal components of the circulating water system are the curtain wall, intake structure, circulating water pumps, condensers, and discharge conduits.

The intake, use, and discharge of water associated with once-through cooling systems are regulated by the Clean Water Act through the National Pollutant Discharge Elimination System (NPDES) discharge permit process (33 USC 1342 Section 404). The NPDES permit specifies the discharge standards and monitoring requirements that the facility must achieve at the point of discharge or outfall to protect water quality. Also associated with the NPDES process are Clean Water Act Section 316(a) and (b) determinations that consider the effects on aquatic biota.

State-established thermal effluent limitations in the NPDES permit may be modified under Section 316(a) to a less stringent level if it can be shown that the less stringent level (i.e., higher temperatures) is sufficient to "ensure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife." The FES stated that the temperature of CCNPP cooling water discharged to the Bay would be 10° F higher than the intake water temperature. CCNPP now operates at a 12° F delta between intake and discharge temperatures.¹ In accordance with the CCNPP operating licenses and state discharge permit, BGE performed a 316(a) study for CCNPP (ANSP 1981). In issuing the CCNPP 1982 discharge permit, the State authorized an increased temperature delta of 12° F, acknowledging the results

¹ In 1977 and 1979, NRC authorized temporary increases to 12° F (Table 2.1-1, Items 3 and 4). In 1982, as part of an industry-wide change, NRC dropped the limit.

of the 316(a) study but concluding that a variance was unnecessary because the CCNPP discharge met water quality standards.

Section 316(b) requires that "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." BGE submitted studies conducted to assess the CCNPP cooling water system's entrainment and impingement impacts on the Chesapeake Bay in the vicinity of CCNPP in accordance with COMAR 08.05.0413C(2)(b).² The 1982 NPDES discharge permit (Appendix B) is evidence of an approved 316(b) demonstration. Included in this permit was the Maryland Department of Natural Resources conclusion that CCNPP was found not to affect spawning or nursery areas of consequence. Subsequent studies and modeling conducted by the Maryland Power Plant Research Program also concluded that entrainment losses have not resulted in depletion of local populations of fish and shellfish (MDNR 1988). Although BGE completed studies of environmental impacts of the CCNPP cooling water intake structure in 1981, BGE has continued to perform impingement studies in accordance with BGE environmental policy and submits annual reports to the State. The fact that the current discharge permit does not require additional studies is evidence of continued State approval.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES AND MITIGATING ACTIONS

4.1 Proposed Action

4.1.3 IMPINGEMENT

NRC

"... If the applicant's plant utilizes once-through cooling or cooling pond heat dissipation systems, the applicant shall provide a copy of current Clean Water Act 316(b) determinations ... or equivalent State permits and supporting documentation. If the applicant can not provide these documents, it shall assess the impact of the proposed action on fish and shellfish resources resulting from ... impingement ..."
10 CFR 51.53(c)(3)(ii)(B)

² 1982 NPDES discharge permit issued pursuant to the 1974 edition of COMAR. Copies of the COMAR Section cited in the text are included in Appendix B.

1 "... The impacts of impingement are small at many plants but may be moderate or even large at a few
2 plants with once-through and cooling-pond cooling systems..." 10 CFR 51, Subpart A, Appendix B,
3 Table B-1, Issue 26

4 NRC made impact on fish and shellfish resources resulting from impingement a Category 2 issue
5 because it could not assign a single significance level to the issue; impingement impacts are small at
6 many plants but might be moderate or large at a few plants. Information needed to be ascertained
7 includes (1) type of cooling system (whether once-through or cooling pond) and (2) current Clean Water
8 Act 316(b) determination or equivalent State documentation.

9 As indicated in Section 2.1.3, CCNPP has a once-through heat dissipation system and documentation of
10 Clean Water Act 316(b) compliance, which means that the existing intake structure reflects the best
11 technology available for minimizing adverse impact at CCNPP.

12 The Maryland Department of Natural Resources has concluded that Maryland power plants do not cause
13 measurable depietion in fish and crab species numbers due to the large size and wide distribution of their
14 populations (MDNR 1993). BGE has identified no mechanism that would alter this conclusion during
15 license renewal.

REFERENCES

- 1
- 2 ANSP (Academy of Natural Sciences of Philadelphia), 1981, *Assessment of Thermal, Entrainment, and*
3 *Impingement Studies on the Chesapeake Bay in the Vicinity of Calvert Cliffs Nuclear Power Plant,*
4 *April 8.*
- 5 MDNR (Maryland Department of Natural Resources), 1988, *Power Plant Cumulative Environmental*
6 *Impact Report for Maryland,* Maryland Power Plant Research Program, Annapolis, Maryland,
7 Maryland, March.
- 8 MDNR (Maryland Department of Natural Resources), 1993, *Maryland Power Plants and the*
9 *Environment, A Review of Power Plants and Transmission Lines On Maryland's Natural Resources,*
10 PPRP-CEIR-8/2, Maryland Power Plant Research Program, Annapolis, Maryland.

1

APPENDIX B. 316(A) AND 316(B) DOCUMENTATION

I. Special Conditions

C. REMOVED SUBSTANCES

1. Within 90 days of the effective date of this permit, the permittee shall submit to DHMH on a form provided, the following information:
 - a) Locate, on a suitable map, all areas used for the disposal of any Removed Substances as defined by II. General Conditions B.7;
 - b) The physical, chemical and biological characteristics and quantities of any Removed Substances handled, and the method of disposal;
 - c) If disposal is handled by other than the permittee identify the contractor or subcontractor, their mailing address, and the information specified in a and b above.
2. Prior to the use of new or additional disposal areas or contractors or subcontractors the permittee shall notify, in writing DHMH.

D. WASTEWATER OPERATOR CERTIFICATION

Within six months from the date of issuance of this permit, the permittee's facility shall be operated by an industrial wastewater operator duly certified by the Maryland Board of Certification. At no time during the effect of this permit shall the treatment facilities be operated for more than six months without a certified operator.

E. THERMAL COMPLIANCE

The Permittee has conducted studies in accordance with COMAR 08.05.04.13C(2) to determine compliance with thermal discharge mixing zone criteria, to determine whether entrainment affects a spawning or nursery area of consequence, and to estimate impingement losses. The Plant was found to meet thermal mixing zone requirements; not to affect spawning or nursery areas of consequence, and to have a modest impingement loss. The present once-through cooling system is in compliance with COMAR 08.05.04.13 and continued use of the system will be permitted. Therefore, alternate effluent limitations as put forth in Section 316(a) of the Clean Water Act are not necessary.

WATER RESOURCES ADMINISTRATION 08.05.04.13C

(8) "Net electrical energy generated" means gross electrical output of the unit measured at the output terminals of the turbine generator during the reporting period, minus the normal station service electrical energy utilization.

(9) "Maximum dependable capacity net (MDC net) (MWe)" means the dependable main-unit gross capacity less normal station service loads, winter or summer, which ever is smaller.

(10) "Tidal water" means water below a point where the tide ebbs and flows.

B. Purpose. The purpose of this regulation is to specify procedures for determining:

(1) Compliance with Maryland Water Quality Standards for thermal discharges;

(2) Best available technology for intake structures to minimize environmental impacts, to be approved in accordance with §316(b) of the Federal Water Pollution Control Act Amendments of 1972 (FWPCA of 1972); and

(3) Alternate effluent limitations" pursuant to §316(a) of the FWPCA of 1972.

C. Requirements.

(1) For discharges of heat equal to or less than a maximum monthly average of 20×10^6 BTU's/day, the mixing zone shall be 50 feet, measured radially from the point of discharge.

(2) Within 180 days of the effective date of these regulations, permittees for discharges of heat greater than 20×10^6 BTU's/day, and other thermal discharges pursuant to the requirements of individual State Discharge Permits* excluding steam electric generating stations not sufficiently loaded #, new sources*, and systems using closed cycle cooling, shall submit a comprehensive plan for:

(a) Studies to determine whether according to the criteria in §E, their facilities' thermal discharge mixing zone complies with State Water Quality Standards;

(b) Studies to determine whether plant cooling water entrainments # affects a spawning or nursery area of consequence for Representative Important Species, (RIS) §D; and

(c) Studies to estimate impingement # loss pursuant to §F (for facilities having surface water intake structures).

08.05.04.18D

DEPARTMENT OF NATURAL RESOURCES

(3) Within 2 years of the effective date of these regulations, a summary of the results of the studies in §C (2) will be submitted, and if the Administration determines that a facility meets the criteria specified in §E, best technology available for intake structures will be determined and a new permit issued after notice and hearing. Upon failure to meet these standards the permittee may:

(a) By January 1, 1983 meet the water quality criteria and install best technology available for intake structures;

(b) By January 1, 1983 install closed cycle cooling in accordance with plans approved by the Administration;

(c) Request an opportunity to demonstrate, pursuant to §G, that existing conditions or alternate effluent limitations will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the receiving water.

(4) These studies shall be conducted in accordance with the following general requirements:

(a) The Administration or its representatives shall be allowed reasonable access to facilities for the purpose of confirmation or conducting parallel studies.

(b) Permittees conducting studies shall submit annual progress reports for review by the Administration. The reports will summarize work completed in the year ending July 30, and will be submitted by October 30. Persons conducting studies also shall submit semi-annual data and sampling summaries to the Administration for review. The Administration may order that a comprehensive plan be modified as a result of its reviews.

(c) Nothing in this regulation may be construed to prevent persons from presenting the results of additional studies regarding impacts. The information requirement of this regulation may be satisfied entirely from existing data provided, in the judgement of the Administration, it is scientifically valid and clearly relevant.

D. Representative Important Species (RIS).

(1) Persons conducting studies shall use selected species from §D(2), below, whenever possible, as a basis for assessing impacts of a discharge on natural water quality. When warranted, the Administration may approve or require additional species not on this list for study at a particular site.

(2) Representative Important Species of Maryland Tidal and Non-Tidal Waters.

Issue: Groundwater Use Conflicts (potable, service water, and dewatering; plants that use greater than 100 gallons per minute)

CHAPTER 2. ALTERNATIVES INCLUDING PROPOSED ACTION

2.1.4 GROUNDWATER USE

FES Section V.B.1 discussed a CCNPP maximum permitted withdrawal rate of 600,000 gallons per day. CCNPP has five production wells that supply process and domestic water within the protected area vicinity and nine wells that supply water for domestic use in outlying areas. The production wells are finished in the Aquia Aquifer (Section 3.2.2). Table 2.1.4-1 identifies these wells, and Figure 2.1.4-1 indicates their locations. CCNPP does not use dewatering pumps. A gravity drain system was installed during original Plant construction to dewater plant areas.

The Maryland Department of Natural Resources requires BGE to monitor and report withdrawal only from the five production wells.¹ Table 2.1.4-2 lists the average daily withdrawal volumes and rates from these wells since 1975. As shown in Table 2.1.4-2 and Figure 2.1.4-2, these production withdrawals are approximately 220,000 gallons per day (153 gallons per minute) and have never approached the current permit limit of 450,000 gallons per day or the previous permit limit of 600,000 gallons per day that the FES analyzed. In addition, CCNPP groundwater withdrawal quantities have followed a downward trend. This trend is primarily the result of improved water chemistry control technology in the CCNPP primary (reactor coolant) and secondary (steam generator) makeup water systems. The improvements have enabled BGE to recirculate water longer before discharge, resulting in less makeup demand.

CHAPTER 3. AFFECTED ENVIRONMENT

3.2 Geology and Groundwater Hydrology

3.2.1 GEOLOGY

CCNPP regional and site geology is Coastal Plain Physiological Province underlain by approximately 2,500 feet of sedimentary strata underlain by metamorphic basement rock, with no evidence of faulting

¹ Condition imposed by CCNPP Groundwater Appropriation and Use Permit.

in the site vicinity. As shown in Figure 3.2.1-1, the strata range from nearly horizontal to gently dipping to the southeast, reflecting the influence of the basement rock slope. Areas above Elevation +70² are Pliocene and Pleistocene silt and sand and are underlain by approximately 270 feet (Elevations +70 to -200) of the relatively impervious sediments of the Chesapeake group of Miocene age (the CCNPP power block area is Elevation +45). The Miocene-age sediments consist of horizontally stratified sandy and clayey silt with occasional interbeds of sands and shells. Approximately 350 feet of dense, relatively pervious glauconitic sand and silt of the Eocene and Paleocene age underlie the Miocene sediments (Elevations -200 to -550). This information remains unchanged from FES Section II.E.1. More detailed geologic information is available in Sections 2.4 and 2.6 of the CCNPP Updated Final Safety Analysis Report (BGE 1995a) and Section 2.5 of the Independent Spent Fuel Storage Installation Environmental Report (BGE 1992).

3.2.2 GROUNDWATER HYDROLOGY

The site water-table occurs generally within 30 feet of the surface in Pleistocene-age deposits (above Elevation +70 at CCNPP). Groundwater flow within approximately 1,000 feet of the Chesapeake Bay at CCNPP is towards the Bay; flow west of the divide is towards surface stream valleys. Surficial soil grain size analysis suggests a maximum permeability coefficient of about 400 gallons per day per square foot. Use of the water-table aquifer is limited to a few domestic wells in the area. CCNPP does not withdraw from this aquifer.

Surficial deposits are underlain by approximately 250 feet of relatively impermeable deposits, the Chesapeake Group, which effectively confine the underlying artesian aquifers. The vertical component of groundwater movement through the Chesapeake Group is upward. Underlying aquifers are composed of glauconitic sand and silt of the Piney Point, Nanjemoy, and Aquia formations, which extend to 650 feet below the surface (to Elevation -550 at CCNPP). The Piney Point and Nanjemoy Aquifers act as a single unit but are separated from the underlying Aquia Aquifer by a layer of clay and silt called the Nanjemoy-Marlboro confining unit. Table 3.2.2-1 provides a brief summary of these aquifers. Formations below the Aquia are either not known to be aquifers in Southern Maryland or are not utilized in Calvert County because of their depth. Section 2.4 of the CCNPP Updated Final Safety Analysis Report (BGE 1995a) provides descriptive information about the formations.

CCNPP withdraws groundwater from the Aquia Aquifer for production and domestic uses (Section 2.1.4). This aquifer underlies much of southern Maryland, with a recharge zone extending from

² Elevations are in feet above (+) or below (-) mean sea level.

1 Washington, D.C. to Annapolis, Maryland and a downward trend to the southeast ending approximately
2 where the Potomac River discharges to the Chesapeake Bay. Figure 3.2.2-1 presents the Aquia Aquifer
3 regional potentiometric³ surface levels.

4 BGE has performed an aquifer test at one well completed in the Aquia Aquifer at the site (BGE 1969).
5 Three observation wells located at different distances from the pumping well were used in the test.
6 Hydraulic properties obtained from this test include the transmissivity and storage coefficient of the
7 Aquia Aquifer at each well location. Transmissivity values obtained from this test ranged from
8 5,640 gallons per day per foot (gpd/ft) to 7,400 gpd/ft. Storage coefficient values ranged from 0.000108
9 to 0.000251, indicating that the aquifer is confined beneath the site.

10 The U.S. Geological Survey and the Maryland Department of Natural Resources (Maryland Power Plant
11 Research Program and Maryland Geological Survey) maintain a joint monitoring program of the Aquia
12 Aquifer. This program has included monitoring the potentiometric surface at CCNPP continuously since
13 the start of operation in 1974. The potentiometric surface at CCNPP is approximately 60 feet below sea
14 level. Hydraulic gradients range from 2 feet per mile (0.0004 feet per foot) northwest of the plant to
15 4 feet per mile (0.0008 feet per foot) south and southwest of the plant. As shown in Figure 3.2.2-2, the
16 Aquia Aquifer potentiometric surface at CCNPP has declined approximately 60 feet since the start of
17 operation.

18 In its most recent (1996) biennial report, the Maryland Power Plant Research Program indicates that,
19 between 1982 to 1993, a decline in the Aquia potentiometric surface was less than 40 feet in most of the
20 aquifer and greater than 40 feet in the Lexington Park and Solomons Island areas (MDNR 1996). During
21 the first ten years of operation water level fluctuation in the Aquia Aquifer measured near the CCNPP
22 correlated with pumping rates at the plant. Since 1989, monitoring indicates that pumping at CCNPP has
23 not directly affected the water level in the Aquia Aquifer. CCNPP groundwater withdrawals in 1989 and
24 1990 were significantly lower due to the reactors not operating, and withdrawals since have remained
25 low. During the shutdown when withdrawals were the lowest, water levels dropped sharply by
26 approximately 25 feet, and then rose 4 feet in early 1992 only to drop an additional 12 feet by the end of
27 1993 (MDNR 1996). During this time, groundwater withdrawals at CCNPP remained consistent with
28 1991 pumping rates. This data suggests that water levels at CCNPP are affected by pumping elsewhere.
29 The study concludes that groundwater withdrawals in the Lexington Park and Solomons Island areas are

³ The "potentiometric surface" is the elevation of groundwater in an open, un-pumped well. Due to the effect of confining layers above the Aquia Aquifer, the Aquia potentiometric surface is higher than the aquifer itself. This results in an artesian condition.

responsible for the recent declines in the water levels at CCNPP, but that these declines are small compared to the approximately 370 feet of available drawdown that remains in the Aquia Aquifer.⁴

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES AND MITIGATING ACTIONS

4.1.5 GROUNDWATER USE

NRC

The environmental report must contain an "...assessment of the impact of the proposed action on groundwater use must be provided, if the applicant's plant uses Ranney wells or pumps more than 100 gallons of ground water per minute." 10 CFR 51.53(c)(3)(ii)(C)

"...Plants that use more than 100 gpm may cause groundwater use conflicts with nearby groundwater users. Impacts from groundwater conflicts could be small, moderate, or large..." 10 CFR 51, Subpart A, Appendix B, Table B-1, Issue 33

NRC made this a Category 2 issue because it could not assign a single significance level (small, moderate, or large) and because, if there were moderate or large impacts, mitigation might be warranted. The effect of groundwater usage on neighboring groundwater users would depend on the rate of usage and the distance to the neighboring well (GEIS Section 4.8.1.1). Therefore, information to be ascertained includes (1) CCNPP groundwater usage rate (whether greater than 100 gallons per minute), (2) distance to neighboring well(s), and (3) impact on the neighboring well(s).

As discussed in Section 2.1.4, CCNPP groundwater usage rate averages approximately 150 gallons per minute, making this groundwater issue applicable to CCNPP. As indicated in Section 3.2.2, CCNPP withdraws its groundwater from the Aquia Aquifer, which is located between 450 and 550 feet below the surface, and the nearest neighboring well that withdraws from this level is located at Southern Middle School, approximately 2 miles away from CCNPP wells. However, as shown on Figure 2.1-3, there is private property located closer to the CCNPP wells. It is possible for the owner of such property to install a well in the Aquia Aquifer at any time. For this reason, BGE has evaluated the potential impact that CCNPP groundwater usage could have on a hypothetical well located at the nearest site boundary in addition to the impact on the nearest existing well (i.e., at Southern Middle School).

⁴ The study is referring to the fact that the Aquia Aquifer potentiometric surface is approximately 370 feet above the aquifer's base.

In performing this evaluation, BGE considered whether particular area geological features could make it likely that other offsite well locations could be impacted to a greater degree than these two well locations. However, as indicated in Section 3.2.1, CCNPP-area geology is well known, relatively homogeneous, and has no folding, faulting, or other irregularities to suggest directed or atypical groundwater flow patterns. Therefore, BGE is confident that impact at the hypothetical well location at the nearest site boundary would be representative of the greatest impacts attributable to CCNPP groundwater usage to any offsite well location.

Groundwater use conflicts can arise if withdrawals by one user cause offsite well water levels to decrease sufficiently to increase pumping costs or, in the extreme, to cause the well to pump dry. BGE has calculated the drawdown that CCNPP pumpage could have on the water level in a hypothetical well located at the site boundary closest to the CCNPP well locations and screened deeper than approximately 550 feet in the Aquia Aquifer (below -450 feet). The results of these calculations are listed below (see Appendix C for calculations):

Year	Drawdown	
	Increment (feet)	Cumulative (feet)
1972	0	0
1975	13.4	13.4
1984	6.1	19.5
1994	1.8	21.3
2004	1.1	22.4
2014	0.7	23.1
2024	0.6	23.7
2034	0.5	24.2

As this calculation illustrates, the greatest amount of incremental drawdown would have occurred when the plant first began operation. During the past 10 years (1984 through 1994), when the potentiometric surface of the Aquia Aquifer dropped by more than 30 feet (Section 3.2.2 and Figure 3.2.2-1), BGE could have contributed 1.8 feet of drawdown. Drawdown currently would be a few inches (less than 1 foot) per year; the cumulative impact for the period of CCNPP license renewal (e.g., years 2014 through 2034) would be approximately 1.1 feet. At the Southern Middle School, the cumulative impact for the CCNPP license renewal period would be approximately the same as for a well on the site boundary, 1.1 feet.

1 These indications of little offsite impact are consistent with the Maryland Department of Natural
2 Resources conclusion that water levels in the Aquia Aquifer in the CCNPP area are most strongly
3 influenced by withdrawals at Lexington Park, Patuxent Naval Air Station, and Solomons Island
4 (combined pumpage approximately 2 million gallons per day; Table 4.1.5-1). Furthermore, the
5 availability of approximately 370 feet of available drawdown should lessen usage conflicts. Based on
6 the evaluation presented above and available drawdown in the Aquia Aquifer, BGE expects impacts to
7 groundwater use through the license renewal term to be small.

8 As indicated in Section 2.1.4, CCNPP has a system installed in the water table to gravity-drain the power
9 block area. Because the water-table flow within 1,000 feet of the Chesapeake Bay is towards the Bay
10 (Section 3.2.2) and there is no private property located within this area at CCNPP, this CCNPP
11 groundwater usage would have no impact on offsite groundwater usage of the water table aquifer.

12 Groundwater usage impact mitigative measures include compensating for lost groundwater access or
13 deepening offsite wells to facilitate recovery. However, projected CCNPP impacts are so minor that BGE
14 has concluded that they would not noticeably alter offsite groundwater usage and that, therefore, the
15 impacts are small and do not warrant mitigation.

References

- 1
- 2 BGE (Baltimore Gas and Electric Company), 1969, *Ground Water Supply Investigation for the Calvert*
3 *Cliffs Nuclear Power Plant near Prince Frederick, Maryland*, Baltimore, Maryland, January.
- 4 BGE (Baltimore Gas and Electric Company), 1992, *Calvert Cliffs Independent Spent Fuel Storage*
5 *Installation (ISFSI) Updated Environmental Report*, Volume III, Lusby, Maryland, December 22.
- 6 BGE (Baltimore Gas and Electric Company), 1995a, *Updated Final Safety Analysis Report, Calvert*
7 *Cliffs Nuclear Plant Units 1 and 2 and Amendments*, Revision 17, Lusby, Maryland.
- 8 CCDPZ (Calvert County Department of Planning and Zoning), 1994, *Calvert County Land Preservation*
9 *& Recreation Plan*, June 7.
- 10 MDNR (Maryland Department of Natural Resources), 1975, *Power Plant Cumulative Environmental*
11 *Impact Report*, PPSP-CEIR-1, Maryland Power Plant Siting Program, Annapolis, Maryland,
12 September.
- 13 MDNR (Maryland Department of Natural Resources), 1978, *Power Plant Cumulative Environmental*
14 *Impact Report*, PPSP-CEIR-2, Maryland Power Plant Siting Program, Annapolis, Maryland,
15 November.
- 16 MDNR (Maryland Department of Natural Resources), 1982, *Power Plant Cumulative Environmental*
17 *Impact Report*, PPSP-CEIR-3, Maryland Power Plant Siting Program, Annapolis, Maryland, January.
- 18 MDNR (Maryland Department of Natural Resources), 1984, *Power Plant Cumulative Environmental*
19 *Impact Report*, PPSP-CEIR-4, Maryland Power Plant Siting Program, Annapolis, Maryland, January.
- 20 MDNR (Maryland Department of Natural Resources), 1986, *Power Plant Cumulative Environmental*
21 *Impact Report for Maryland*, PPER-CEIR-5, Maryland Power Plant Siting Program, Annapolis,
22 Maryland, March.
- 23 MDNR (Maryland Department of Natural Resources), 1988, *Power Plant Cumulative Environmental*
24 *Impact Report for Maryland*, PPER-CEIR-6, Maryland Power Plant Research Program, Annapolis,
25 Maryland, November.

- 1 MDNR (Maryland Department of Natural Resources), 1991, *Power Plant Cumulative Environmental*
2 *Impact Report for Maryland*, PPER-CEIR-7, Power Plant and Environmental Review, Annapolis,
3 Maryland.
- 4 MDNR (Maryland Department of Natural Resources), 1993, *Maryland Power Plants and the*
5 *Environment, A Review of Power Plants and Transmission Lines On Maryland's Natural Resources*,
6 PPRP-CEIR-8/2, Maryland Power Plant Research Program, Annapolis, Maryland, March.
- 7 MDNR (Maryland Department of Natural Resources), 1996, *Maryland Power Plants and the*
8 *Environment: A review of the impacts of power plant and transmission lines on Maryland's natural*
9 *resources, Supporting Materials*, PPRP-CEIR-9/2, Maryland Power Plant Research Program,
10 Annapolis, Maryland, May.
- 11 USGS (U.S. Geological Survey), 1991, *Hydrogeological Framework of the Coastal Plain of Maryland,*
12 *Delaware, and the District of Columbia*, PB92-146745, U.S. Department of Commerce, National
13 Technical Information Service, Reston, Virginia.
- 14 USGS (U.S. Geological Survey), *Aquia Aquifer Wells*, 1995.
15

Table 2.1.4-1. CCNPP water supply wells.^{a,b}

Number	Well Tag Number	Date Installed	Well Location	Depth (feet)	Aquifer	Use	Appropriation Permit Number	Appropriation Limit (Daily Average)
1.	Unknown	c1970	Protected Area vicinity	585	Aquia	Domestic and industrial in protected area	CA69G010(04)	450,000 gallons per day (gpd)
2.	CA-70-0063	1970	Protected Area vicinity	637	Aquia	Domestic and industrial in protected area	CA69G010(04)	450,000 gpd
3.	CA-72-0041	1971	Protected Area vicinity	607	Aquia	Domestic and industrial in protected area	CA69G010(04)	450,000 gpd
4.	CA-73-4435	1982	Protected Area vicinity	608	Aquia	Domestic in office area	CA69G010(04)	450,000 gpd
5.	CA-73-4436	1982	Protected Area vicinity	621	Aquia	Domestic in office area	CA69G010(04)	45,000 gpd
6.	CA-73-0369	1974	Old Bay Farm	620	Aquia	Domestic in farms buildings	NA ^c	NA
7.	CA-88-1068	1989	Firearms Range	430	Piney Point	Domestic at firearms range	CA89G007(01)	500 gpd
8.	CA-81-0527	1983	Visitors Center	385	Piney Point	Domestic at visitors and educational areas	CA83G008(02)	300 gpd
9.	CA-73-3895	1980	Camp Conoy ^d	370	Nanjemoy	Domestic at pool	CA63G003(06)	400 gpd
10.	CA-73-3896	1980	Camp Conoy	390	Nanjemoy	Domestic at pool	CA63G003(06)	400 gpd
11.	CA-81-2152	1986	Camp Conoy	560	Aquia	Domestic at pool	CA63G003(06)	400 gpd
12.	CA-73-3897	1980	Camp Conoy	415	Nanjemoy	Domestic at ball field		
13.	CA-81-1067	1984	Camp Conoy	405	Nanjemoy	Domestic at conference center		
14.	CA-88-1636	1990	Procedure Upgrade Project Facility	420	Nanjemoy	Domestic at Procedure Upgrade Project Facility	NA	NA

a. Source: CCNPP Groundwater Appropriation Permits and well completion reports.

b. Does not include monitoring wells.

c. NA = not applicable because withdrawal rate is below regulatory threshold.

d. Camp Conoy is employee recreation area.

Table 2.1.4-2. CCNPP groundwater withdrawals.^a

Year	Daily Average	
	Total gallons	Gallons per minute
1975	230,000	160
1976	200,000	139
1977	250,000	174
1978	230,000	160
1979	250,000	174
1980	250,000	174
1981	270,000	188
1982	270,000	188
1983	250,000	174
1984	280,000	194
1985	260,000	181
1986	260,000	181
1987	380,000	264
1988	250,000	174
1989	70,000 ^b	49
1990	90,000 ^b	63
1991	150,000	104
1992	150,000	104
1993	180,000	125
1994	170,000	118
Average	220,000	153

a. Source: CCNPP groundwater withdrawal reports for indicated years.

b. Reactors shut down.

Table 3.2.2-1. Calvert County aquifers.^a

Geologic age	Description	Physical description	Water-bearing properties	Thickness in region (feet)	Approximate elevation at CCNPP ^b
Pleistocene	Surficial deposits	Silt, sand, and some clay	Small quantities of water to shallow wells.	0 - 150	Above +70
Miocene	Chesapeake Group	Sandy and clayey silt	Yields small amounts of water in a few dug wells.	30 - 325	Between +70 and -200
Eocene	Piney Point Formation	Glauconitic sand	Yields up to 200 gallons per minute (gpm). Important aquifer in Calvert County.	0 - 60	Between -200 and -240
	Nanjemoy Formation	Glauconitic sand with clayey layers	Yields up to 60 gpm reported. Important aquifer in Calvert County.	40 - 240	Between -240 and -300
	Nanjemoy-Marlboro	Clay, silt	Confining unit.	0 - 700	Between -300 and -450
Paleocene	Aquia Formation	Green to brown glauconitic sand	Yields up to 300 gpm. Important aquifer in Southern Maryland.	30 - 200	Between -450 and -550

a. Sources: (BGE 1995a; USGS 1991).

b. Elevations are in feet above (+) or below (-) mean

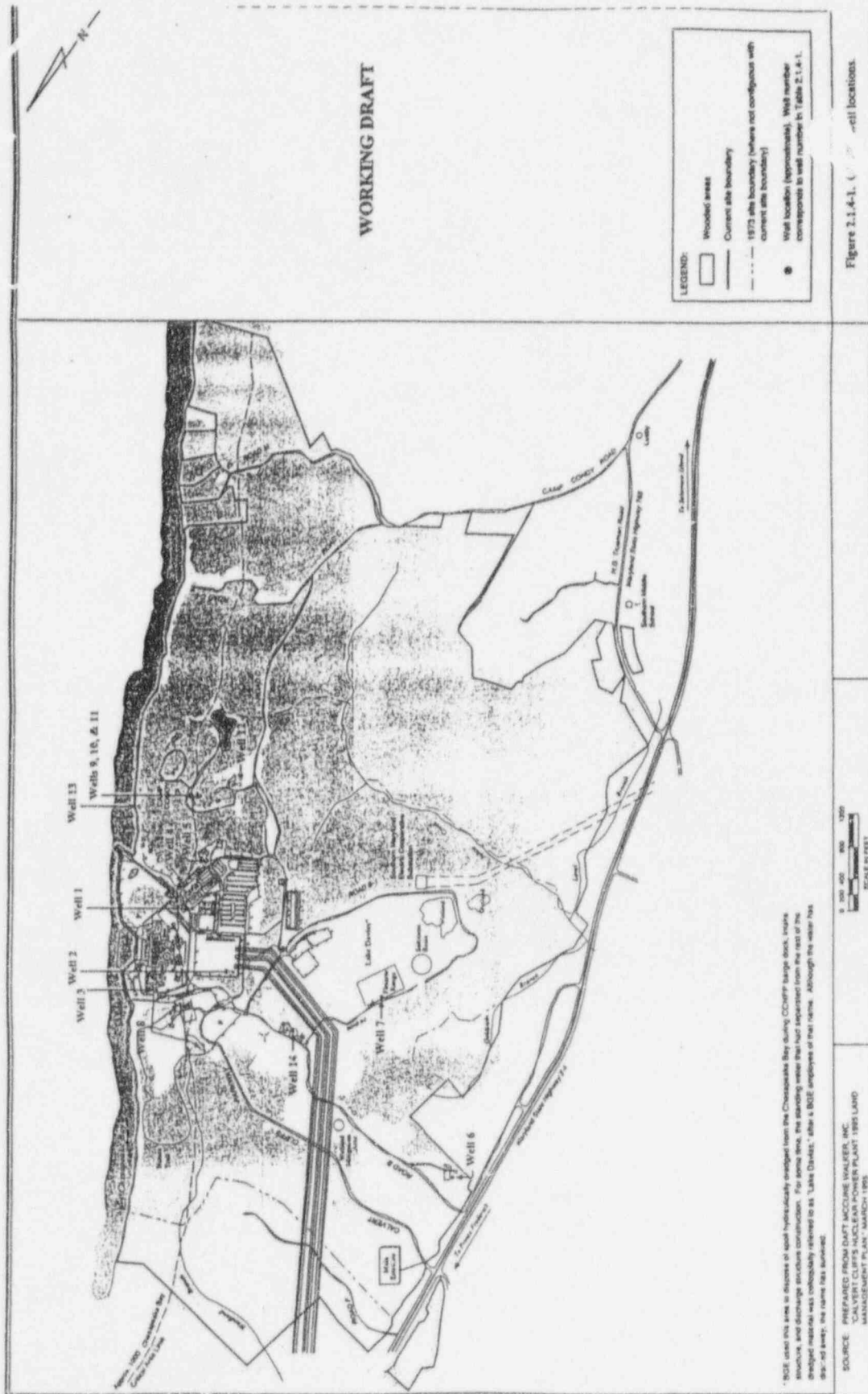
Table 4.1.5-1. Public supply wells in Calvert County in 1992.^a

Location	Population served	Average output (gallons per day)	Depth (feet)
Beaches Water	2,000	126,000	262-585
Calvert Beach	222	17,000	262-323
Cavalier County	402	45,000	542-552
Chesapeake Beach	2,500	199,000	373-550
Chesapeake Heights	612	55,000	475-595
Chesapeake Ranch Estates	3,000	225,000	355-678
Dares Beach	501	38,000	272-530
Hunting Hills	150	14,000	365-504
Kenwood Beach	255	21,000	365
Lakewood	260	23,000	335-425
Lexington Park ^b	NA ^c	1,203,000	550-600
Mason Road	50	5,000	542
Paris Oaks	147	13,000	413
Parkers Creek Knolls	30	2,000	340
Patuxent Naval Air Station ^b	NA	616,000	450-550
Prince Frederick	600	114,000	540-605
Randle Cliffs	150	1,000	NA
St. Leonard	100	12,000	603
Scientists Cliffs	500	45,000	227-633
Shores of Calvert	414	30,000	473
Solomons Island	2,000	225,000	330-430
Summit	500	40,000	480-548
Wallville Acres	21	2,000	NA
Western Shores	175	22,000	NA
White Sands	120	7,000	389

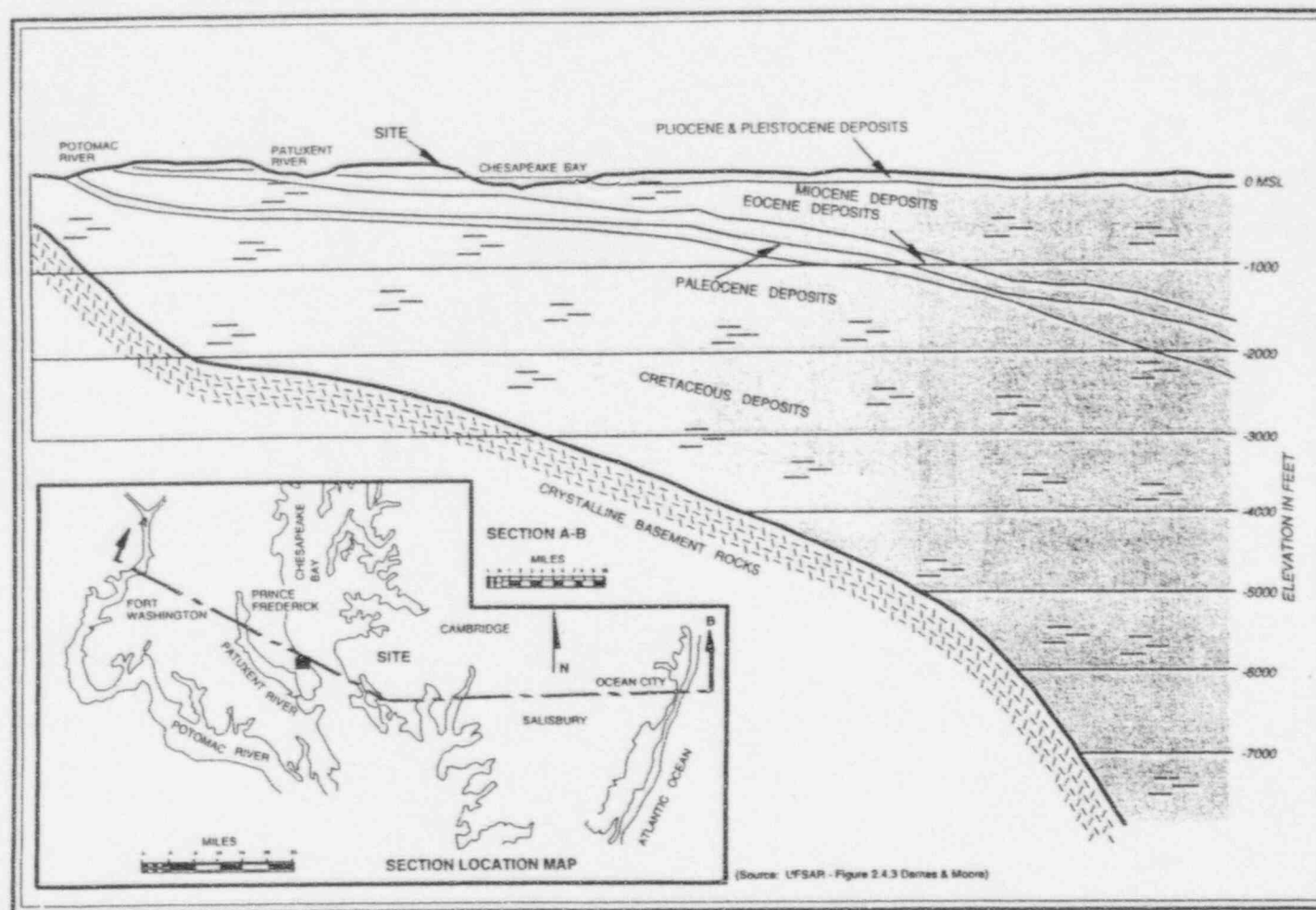
a. Source: (CCDPZ 1994), except as noted.

b. Source: (USGS 1995). Located in St. Mary's County but included due to significance of output and proximity to CCNPP.

c. NA = not available.



WORKING DRAFT



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Figure 3.2.1-1. Regional geologic section - Coastal Plain.

WORKING DRAFT

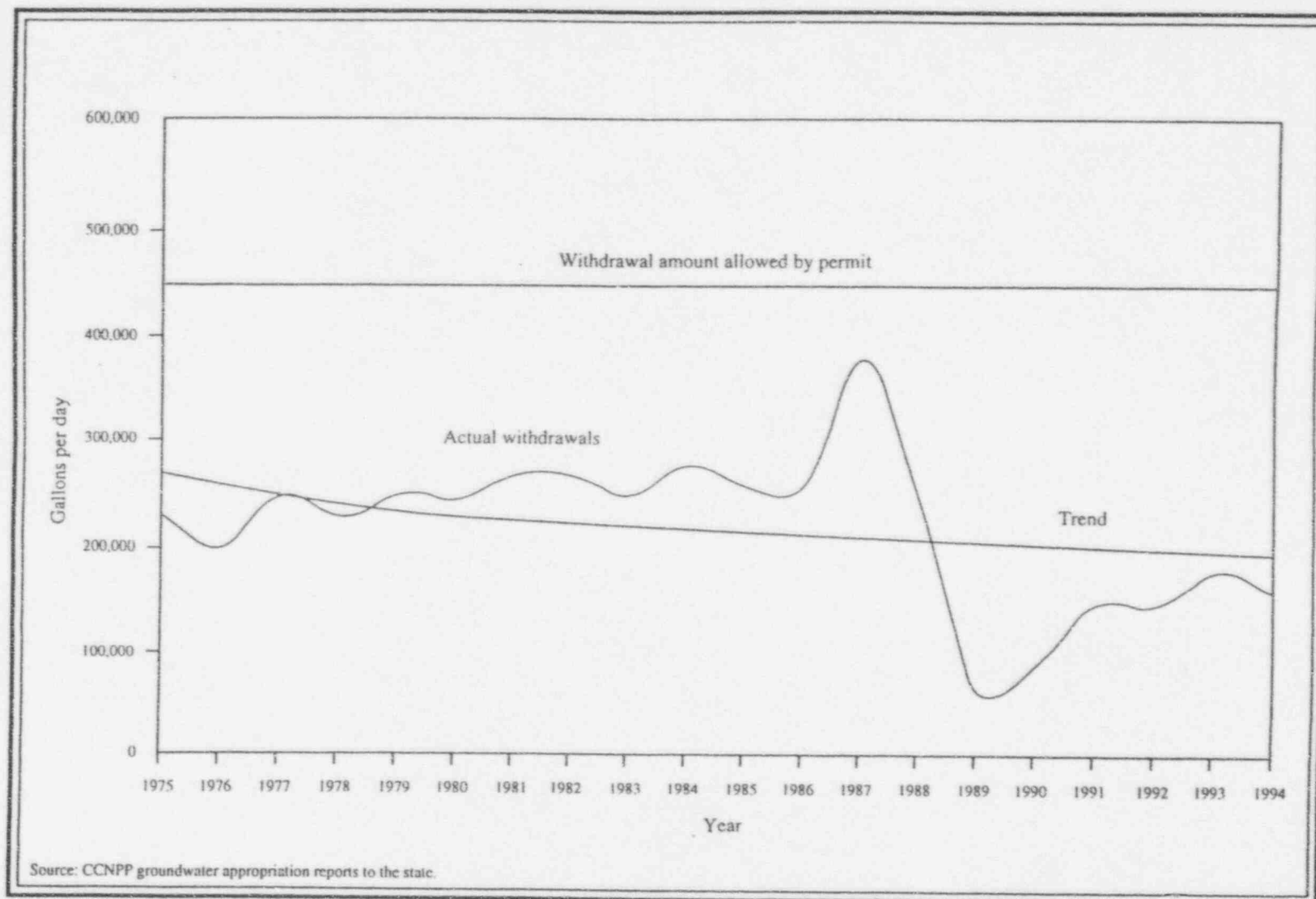
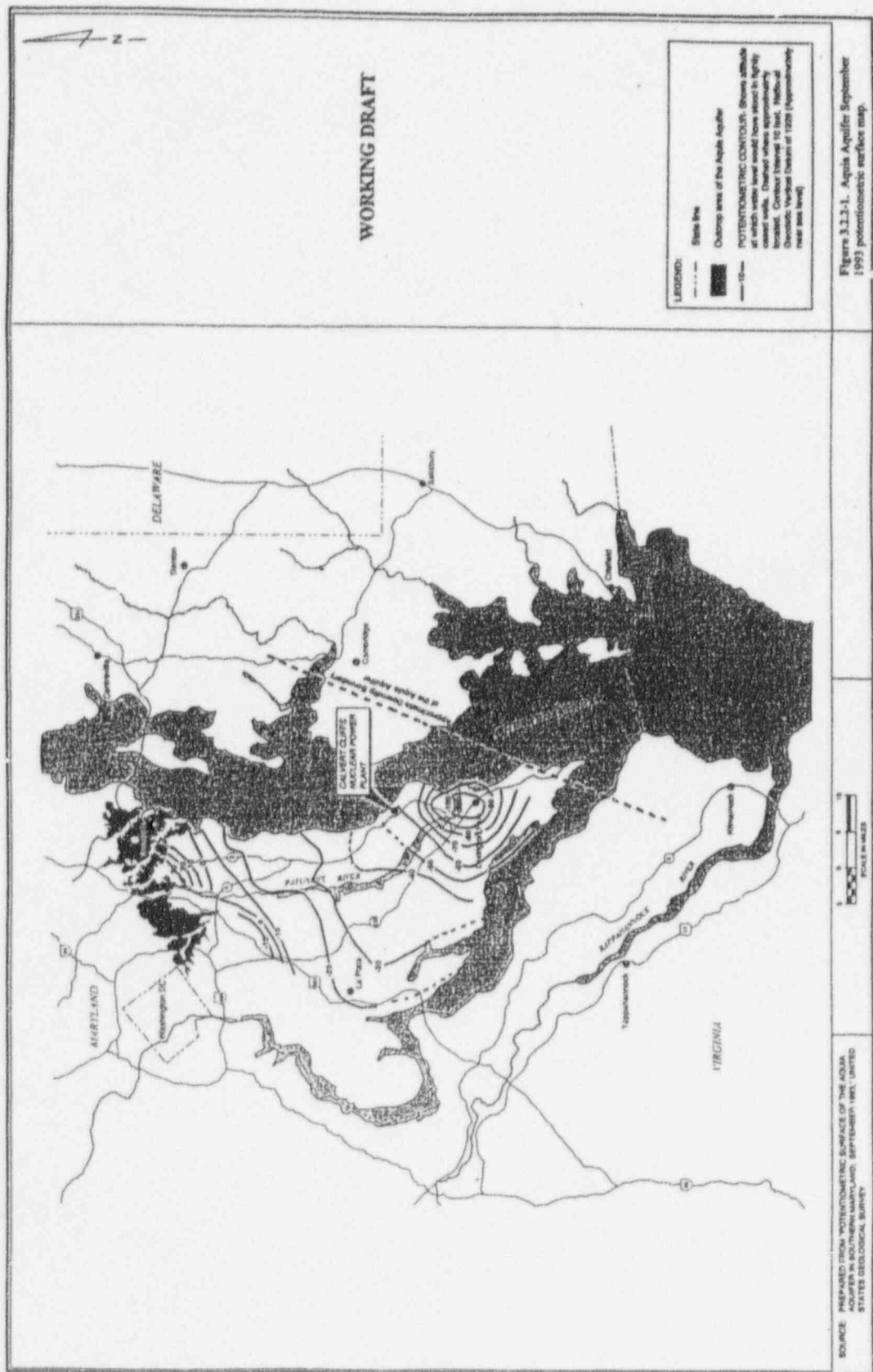
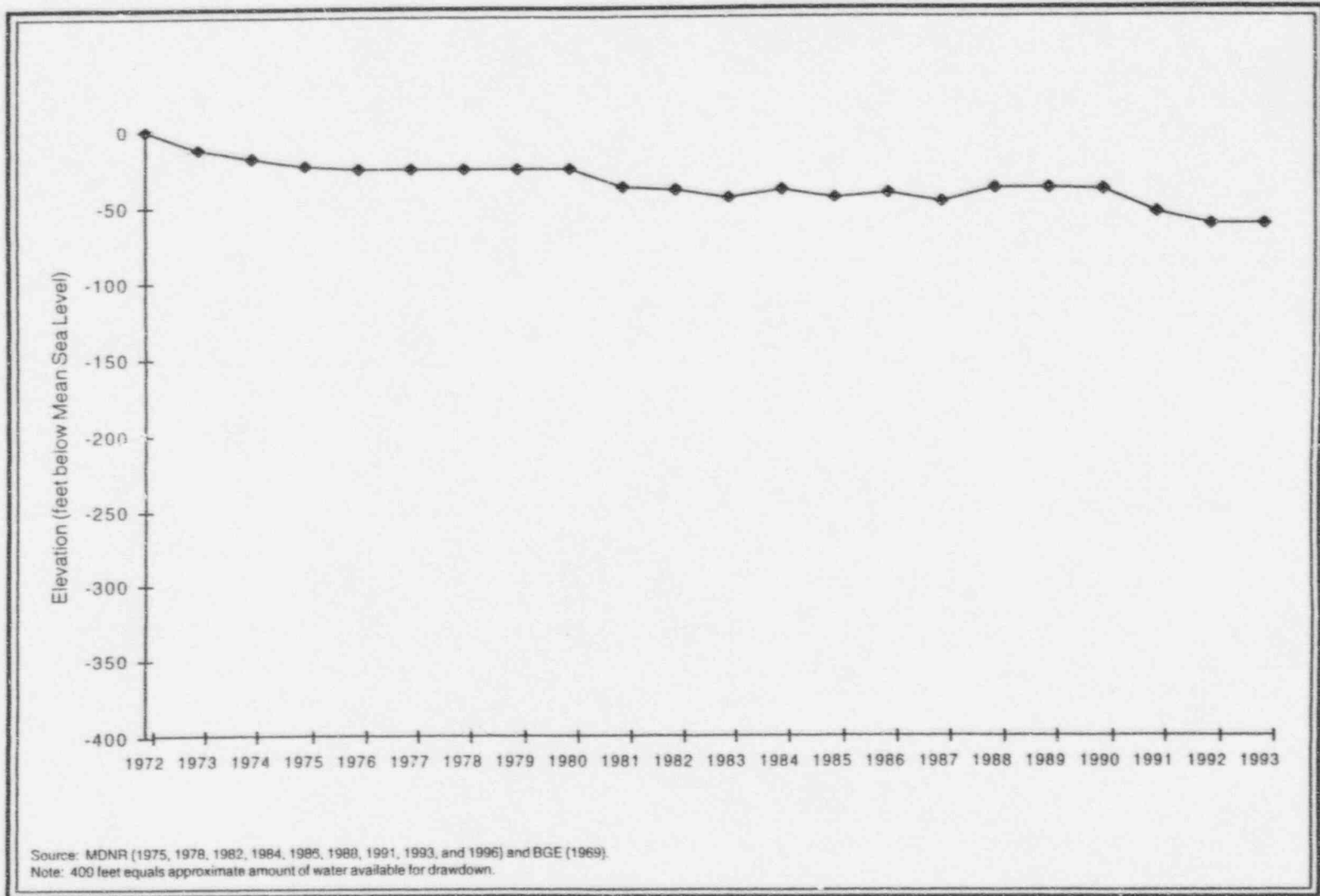


Figure 2.1.4-2. CCNPP groundwater withdrawals.

PX01-1

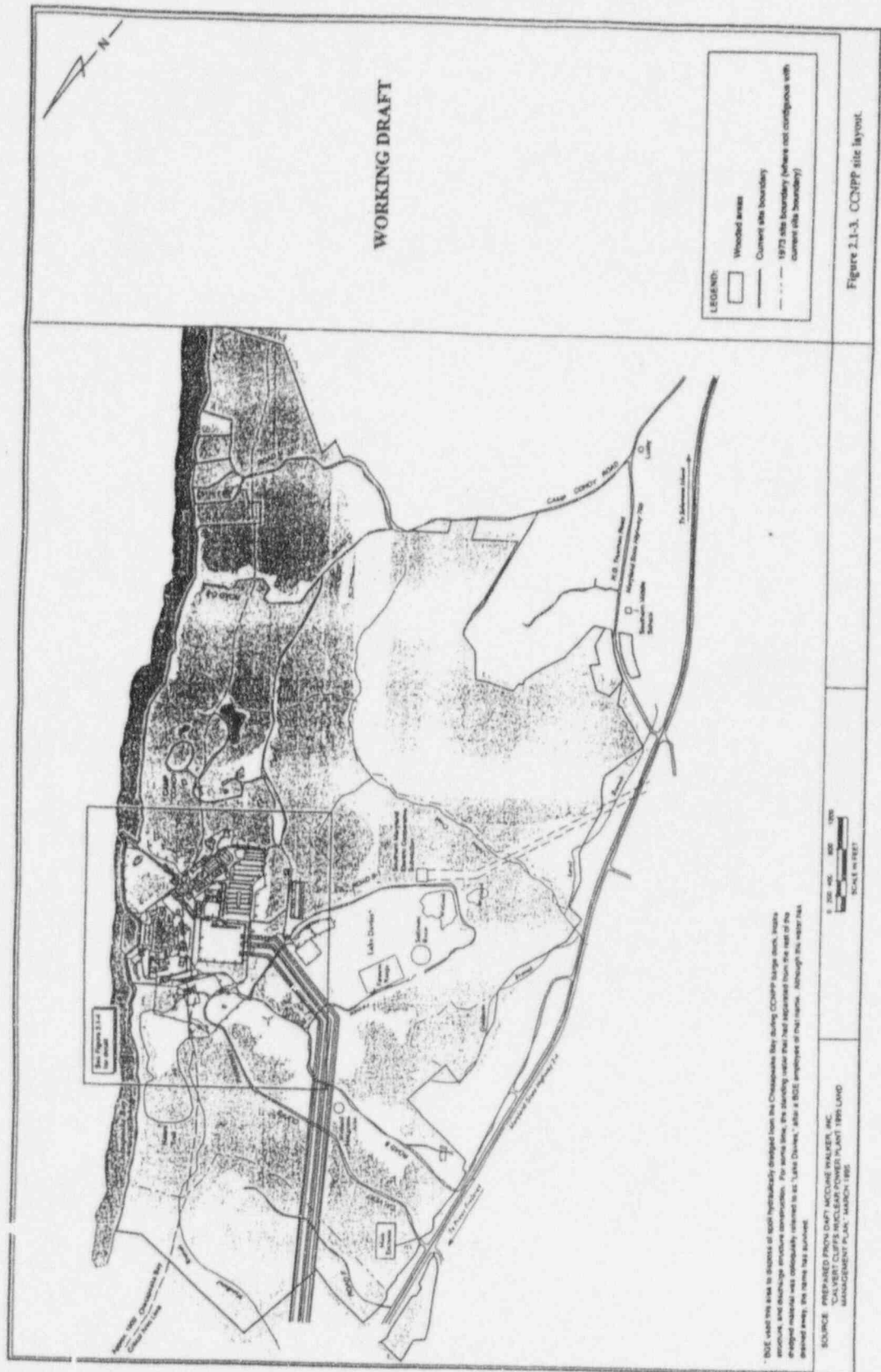


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Figure 3.2.2-2. Aquia Aquifer potentiometric surface levels at CCNPP.



APPENDIX C. OFFSITE WELL IMPACT CALCULATION

C.1 Background Assumptions

This appendix shows how the Baltimore Gas and Electric Company (BGE) has calculated the potential impact that the Calvert Cliffs Nuclear Power Plant (CCNPP) groundwater withdrawal could have on a hypothetical well located on the site boundary closest to the CCNPP point of withdrawal. Although CCNPP has numerous wells, the Maryland Department of Natural Resources requires BGE to monitor withdrawals only from wells that withdraw the most water, the five located in the Protected Area.⁵ These monitoring records show that, since beginning operation in 1974, CCNPP has withdrawn an average of approximately 150 gallons per day of groundwater. For the sake of simplicity of calculation, it is assumed that all withdrawals are from a single point. Drawdown may be expressed as:

1. $s = [114.6Q / T]W(u)$, where:

s = drawdown in feet

Q = well discharge in gallons per minute

T = transmissivity in gallons per day per foot

$W(u)$ = exponential integral termed "well function." The argument is given by:

$u = 1.87r^2S / Tt$, where:

S = storage coefficient

r^2 = the square of the distance in feet from the pumped well

t = time in days since pumping started

For CCNPP:

Q = 150 gallons per minute

T = 6,500 gallons per day per foot (Bechtel 1969)

r = 5,000 feet

S = 1.8E-04 (Bechtel 1969)

⁵Requirement in groundwater appropriation permit.

C.2 First-Year Calculation

The calculation for drawdown expected after the first year (365 days) of CCNPP operation is as follows:

$$u = \frac{(1.87)(5,000)^2 (0.00018)}{(6,500)(365)} = 0.00354 = 3.54 \times 10^{-3}$$

From the table of $W(u)$ and u (Abramowitz and Stegan 1972), if $u = 3.54 \times 10^{-3}$, $W(u) = 5.07$

$$s = \frac{(114.6)(150)(5.07)}{6,500} = 13.4 \text{ feet}$$

C.3 10-Year Calculation

The calculation for drawdown expected after ten years (3650 days) of CCNPP operation is as follows:

$$u = \frac{(1.87)(5,000)^2 (0.00018)}{(6,500)(3,650)} = 0.000355 = 3.55 \times 10^{-4}$$

From the table of $W(u)$ and u , if $u = 3.55 \times 10^{-4}$, $W(u) = 7.37$

$$s = \frac{(114.6)(150)(7.37)}{6,500} = 19.5 \text{ feet}$$

References for Appendix C

Bechtel Corporation, 1969, *Ground Water Supply Investigation for the Calvert Cliffs Nuclear Power Plant Near Prince Frederick, Maryland*, Gaithersburg, Maryland, January. Transmissivity and the storage coefficient values are averages generated from the aquifer pump test published in this report.

Abramowitz, M. and Stegun, I. A., 1972, *Handbook of Mathematical Functions*, National Bureau of Standards, Applied Mathematics Series 55, 10th edition, Table W(u) and u.

Issue: Public Services, Transportation

CHAPTER 2. ALTERNATIVES INCLUDING PROPOSED ACTION

2.1 Proposed Action

2.1.7 EMPLOYMENT

Section 2.1.7 identifies the size of the current CCNPP workforce, explains the basis for predicting changes that would be attributable to license renewal, and compares GEIS and CCNPP estimates to provide a basis for determining whether GEIS assumptions bound the CCNPP case.

Current Workforce

The CCNPP employs a permanent workforce of approximately 1,970 (1995), a number that is slightly higher than the range of 600 to 800 personnel per reactor unit that GEIS Section 2.3.8.1 estimates. Approximately 60 percent of CCNPP employees (1,104) live in Calvert County, 16 percent live in adjacent St. Mary's County, and the remaining 24 percent live in various other locations (Tucker 1995). Approximately once a year, site employment increases by as many as 700 workers for temporary (1-3 months) duty during refueling outages.¹ This number is within the GEIS range of 200 and 900 additional workers per reactor outage.

License Renewal Increment

Performing the license renewal SMITTR and refurbishment activities that Section 2.1.6 describes would necessitate increasing the size of the CCNPP workforce by some increment. The size of this increment is a function of the schedule within which the work must be accomplished and the workload.

The GEIS assumes that NRC would renew a nuclear power plant license for a 20-year period plus the remaining duration of the current license and that it would issue the renewal approximately 10 years prior to license expiration. In other words, the renewed license would be good for 30 years. The GEIS determined that the utility would initiate SMITTR activities at the time of issuance and would conduct license renewal SMITTR activities throughout the remaining 30-year life of the plant, sometimes during full power operation (GEIS Section B.3.1.3) but mostly during normal refueling, and 5-year and 10-year

¹ CCNPP units are on 2-year refueling intervals, and BGE generally schedules outages on staggered schedules.

in-service refueling outages (GEIS Table B.4). The GEIS also assumes that major refurbishment activities would be scheduled for completion during the 5 outages leading up to the expiration of the current license period (i.e., during years 1-10 of the renewed license).

BGE has determined that the GEIS scheduling assumptions are reasonably representative of CCNPP incremental license renewal workload scheduling. Most CCNPP license renewal SMITTR activities that Section 2.1.6 describes would have to be performed during outages. Although some CCNPP license renewal SMITTR activities would be one-time efforts, others would be recurring, periodic activities that would continue for the life of the plant. As noted in Section 2.1.6, however, BGE does not anticipate the level of refurbishment assumed by the GEIS. The minor CCNPP refurbishment activity currently proposed (cable replacement) would take place during routine refueling outages.

Table 2.1.7-1 and Figure 2.1.7-1 compare GEIS and CCNPP identification of license renewal outages, outage durations, license renewal labor hours, and additional personnel needed. The differences between the GEIS and CCNPP estimates are attributable to the difference in anticipated refurbishment activities; CCNPP would not have refurbishment outages but, instead would have normal refueling and 5- and 10-year in-service inspections. As shown, the GEIS and CCNPP estimate that most of the additional personnel needed to perform license renewal SMITTR activities would typically be 60 persons during the 3-month duration of a 10-year in-service refueling. Having established this upper value for what would be a single event in 20 years, the GEIS uses this number as the expected number of additional permanent workers needed per unit attributable to license renewal. GEIS Section C.3.1.2 uses this approach in order to "...provide a realistic upper bound to potential population-driven impacts...." For the purpose of performing its own analyses in this environmental report, BGE is adopting the GEIS approach with one alteration. CCNPP license renewal plant modifications would be SMITTR activities that would be performed mostly during outages and CCNPP Unit 1 and Unit 2 outage schedules are generally staggered so as to not coincide. Therefore, BGE believes that it is unreasonable to assume that each unit would need an additional 60 workers. Instead, as a reasonably conservative high estimate, BGE is assuming that CCNPP would require a total of 60 additional permanent workers to perform license renewal SMITTR activities.

Conclusion

BGE estimates that CCNPP license renewal would necessitate the addition of a maximum of 60 workers to perform license renewal SMITTR activities during four 3-month long 10-year in-service inspections (2 per reactor). In order to provide a realistic upper bound to potential population-driven impacts, the

environmental report assumes that the permanent full time CCNPP workforce would increase by 60, an increase of 3 percent, from 1,970 to 2,030 workers.

CHAPTER 3. AFFECTED ENVIRONMENT

3.5 Public Services

3.5.3 TRANSPORTATION

Calvert County has one main four-lane road (Maryland State Highway 2-4) bisecting the county north to south with smaller roads running like veins from the main road to the water on each side. Very few of the smaller roads off Maryland 2-4 connect with each other; therefore, this highway services the bulk of the traffic for the length of the county. This highway runs adjacent to the CCNPP site and provides the only access to the site (Figure 2.1-3). The U.S. Transportation Research Board has developed a commonly used indicator (level of service) for measuring how well a roadway handles traffic volume. Level of service is a qualitative measure of how efficiently an intersection or roadway services traffic volume and the amount of vehicle delay that may be encountered by the average vehicle during peak hours. The level of service definitions used by local and state agencies, as well as the NRC in the GEIS analysis, are provided in Table 3.5.3-1. Transportation studies performed by the State Highway Administration indicate Maryland 2-4 generally operates at a level of service of A with free flowing traffic (Parrot 1996). Specifically in the area of CCNPP, County transportation studies indicate that the segment of Maryland 2-4 approximately 2 miles north of CCNPP operates at an LOS of C with no congestion, and Maryland 2-4 south of the plant to the County line operates at an LOS of A/B (Jakubiak 1996). The lower LOS reported for the section north of the plant is probably attributable to the continued growth of the area. This growth has resulted in an ongoing demand for traffic controls such as lights that are currently being added in the Prince Frederick area.

Based on 1995 traffic data in the vicinity of CCNPP, daily northbound traffic averaged 17,250 vehicles and daily southbound traffic averaged 12,650 vehicles (Parrot 1996). A transportation study conducted by BGE in 1992 (Rummel, Klepper, and Kahl 1992) reports traffic counts at the intersection of Maryland 2-4 and Calvert Cliffs Parkway that form the entrance to CCNPP for the morning and afternoon peak hours. Results indicate that traffic flow in and out of the plant account for approximately half of the vehicles traveling through the intersection during the hours observed. Rummel, Klepper and Kahl also report that the intersection operates at an LOS of A in both the morning and afternoon peak hours.

BGE has made several improvements to the intersection of Maryland 2-4 and Calvert Cliffs Parkway. Between 1989 and 1990, BGE underwrote the costs (\$42,000) of installing four street lights just inside the State Highway Administration right-of-way at the entrance to improve visibility for the intersection. In 1992 to reduce congestion at the entrance, BGE added an acceleration lane southbound at a cost of approximately \$125,000 (BGE 1993b).

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES AND MITIGATING ACTIONS

4.1.15 PUBLIC SERVICES TRANSPORTATION

NRC

The environmental report must contain an "...an assessment of the impact of the proposed action on local transportation during periods of license renewal refurbishment activities." 10 CFR 51.53(c)(3)(ii)(J)

"...Transportation impacts are generally expected to be of small significance. However, the increase in traffic with the additional workers and local road and traffic control conditions may lead to impacts of moderate or large significance at some sites..." 10 CFR 51, Subpart A, Appendix B, Table B-1, Issue 70

Small impacts would be associated with a free flowing traffic stream where users are unaffected by the presence of other users (level of service A) or stable flow in which the freedom to select speed is unaffected but the freedom to maneuver is slightly diminished (level of service B). GEIS Section 3.7.4.2

NRC made impacts to transportation a Category 2 issue because impact significance is determined primarily by road conditions existing at the time of the project that NRC could not forecast for all plants (GEIS Section 3.7.4.2). Local road conditions to be ascertained are (1) level of service conditions and (2) incremental increase in traffic associated with license renewal SMITTR and refurbishment staff.

The GEIS relates the significance of transportation impacts to the Transportation Research Board's level of service definitions. Level of service A and B are associated with small impacts because the operation of individual users is not substantially affected by the presence of other users, and at this level no delays occur and no improvements are needed (GEIS Section 3.7.4.2). Section 3.5.3 describes the road conditions in the CCNPP area. Maryland 2-4 that provides access to the plant is generally characterized as free flowing with a level of service A/B, except for a section north of the plant that has a level of service C. Based on the level of service ratings alone, BGE expects impacts to transportation to be "small," with possible "moderate" impacts through the one area north of the plant.

1 However, the low number of additional staff needed for SMITTR activities through the renewal term
2 would limit potential impacts. As described in Section 2.1.7, a staff increase of 60 additional full time
3 employees could result from license renewal SMITTR and refurbishment activities. Average traffic flow
4 is given in Section 3.5.3 for both northbound and southbound directions. Assuming half of these
5 additional employees would travel north on Maryland 2-4 and half would travel south, the traffic impact
6 resulting from 60 additional vehicles represents an increase of less than 1 percent (0.002 percent) of the
7 average daily traffic. Based on the minor increase in traffic flow and the general LOS rating of A/B for
8 Maryland 2-4, CCNPP license renewal impacts on transportation (Issue 70) would be expected to be
9 "small."

10 Section 3.5.3 describes measures BGE has taken to increase motorist safety at the entrance. The only
11 effective measure to improve the level of service of Maryland 2-4 would be to expand the highway to
12 three lanes. The minor increase in CCNPP staff as a result of license renewal SMITTR and
13 refurbishment activities would not warrant such an expenditure. However, BGE would continue
14 programs currently in place to reduce impacts to the local transportation system. CCNPP encourages its
15 employees to participate in carpools by offering preferred parking at the plant. In addition, continued
16 BGE tax payments through the license renewal term would support transportation improvements spurred
17 by rapid growth of the Tri-County area.

References

- 1
2
3 BGE (Baltimore Gas and Electric Company), 1993b, *Intersection of Route 4 and Calvert Cliffs Parkway*,
4 Nuclear Security Memorandum , Lusby, Maryland, January 18.
- 5 Jakubiak. C. N., 1996, Calvert County Department of Planning and Zoning, Prince Frederick, Maryland
6 personal communication with T. Hudson, Halliburton NUS, Aiken, South Carolina, " MD 2/4 LOS
7 near BGE plant," November 13.
- 8 NRC (U.S. Nuclear Regulatory Commission), 1996, *Generic Environmental Impact Statement for*
9 *License Renewal of Nuclear Power Plants*, NUREG-1437, Washington, D.C., May.
- 10 Parrott, N., 1996, Maryland Department of Transportation, Annapolis, Maryland personal
11 communication with T. Hudson, Halliburton NUS, Aiken, South Carolina, "LOS data for Maryland
12 Highway 2/4 and the vicinity of CCNPP," November 13.
- 13 Rummel, Klepper, and Kahl, 1992, *Calvert Cliffs Nuclear Power Facility Transportation Study*,
14 Baltimore, Maryland, July 6.
- 15 Tucker, R. L., 1995, Baltimore Gas and Electric Company, Lusby, Maryland, personal communication
16 with J. F. Bradley, Halliburton NUS Corporation, Aiken, South Carolina, "Employment Level at
17 CCNPP," June 26.

Table 2.1.7-1. Comparison of GEIS to CCNPP license renewal personnel estimates.^a

Outage type	GEIS estimates ^b	CCNPP estimates
SMITTR activities		
None (full power operation)	0 labor hours 0 additional personnel	0 labor hours 0 additional personnel
Normal refueling	8 occurrences, each requiring: 2-month duration 3,488 labor hours 8 additional personnel	12 occurrences, each requiring: 2-month duration 3,488 labor hours 8 additional personnel
5-year in-service refueling	2 occurrences, each requiring: 3-month duration 20,935 labor hours 33 additional personnel	3 occurrences, each requiring: 3-month duration 20,935 labor hours 33 additional personnel
10-year in-service refueling	1 occurrence, requiring: 3-month duration 37,482 labor hours 60 additional personnel	2 occurrences, each requiring: 3-month duration 37,482 labor hours 60 additional personnel
Major refurbishment activities		
Current term refurbishment	4 occurrences, each requiring: 3-month duration each 45,924 labor hours 72 additional personnel	0 occurrences
Major refurbishment outage	1 occurrence, requiring: 4-month duration 219,018 labor hours 264 additional personnel	0 occurrences

a. Estimates are per reactor.

b. Source: Modified from NRC (1996), Table B.4.

1 **Table 3.5.3-1. Level of Service definitions.^a**

Level of service	Conditions
A	Free flow of the traffic stream; users are unaffected by the presence of others.
B	Stable flow in which the freedom to select speed is unaffected but the freedom to maneuver is slightly diminished.
C	Stable flow that marks the beginning of the range of flow in which the operation of individual users is significantly affected by interactions with the traffic stream.
D	High-density, stable flow in which speed and freedom to maneuver are severely restricted; small increases in traffic will generally cause operational problems.
E	Operating conditions at or near capacity level causing low but uniform speeds and extremely difficult maneuvering that is accomplished by forcing another vehicle to give way; small increases in flow or minor perturbations will cause breakdowns.
F	Defines forced or breakdown flow that occurs wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. This situation causes the formation of queues characterized by stop-and-go waves and extreme instability.

2
3 a. Source: (NRC 1996).

Issue: Alternatives

CHAPTER 2. ALTERNATIVES INCLUDING PROPOSED ACTION

2.2 Alternatives

NRC

"The environmental report shall discuss alternatives to the proposed action." 10 CFR 51.45(b)(3), as adopted by reference at 10 CFR 51.53(c)(2)

"While many methods are available for generating electricity, and a huge number of combinations or mixes can be assimilated to meet a defined generating requirement, such expansive consideration would be too unwieldy to perform given the purposes of this analysis. Therefore, NRC has determined that a reasonable set of alternatives should be limited to analysis of single, discrete electric generation sources and only electric generation sources that are technically feasible and commercially available..." GEIS Section 8.1.

"...the consideration of alternative energy sources in individual license renewal reviews will consider those alternatives that are reasonable for the region, including power purchases from outside the applicant's service area...." Supplementary information to final rule, 61 FR 66537 - 66554, December 18, 1996, at Section II.H, page 66541, column 3.

The determination of what is a reasonable form of electric power generation within Maryland is effectively made by three entities: utilities, the Maryland Public Service Commission, and the Maryland Power Plant Research Program. Like many states, Maryland has a Public Service Commission that regulates electric power companies such as BGE. Perhaps unique among the states, Maryland has also established, within the Department of Natural Resources, the Maryland Power Plant Research Program. This state agency is required by Maryland law to review and evaluate the impacts to Maryland's environment from the construction and operation of electric power generating and transmission systems. The Power Plant Research Program summarizes these evaluations biennially and advises the Public Service Commission on environmental impacts of utility proposals. This environmental report makes extensive reference to Maryland Power Plant Research Program publications.

The principal fuel burned in Maryland's power plants is coal, which in 1993 accounted for roughly 57 percent of the generation in Maryland. Nuclear generation, represented by CCNPP, accounted for 28 percent of the total, and oil and gas combined to produce approximately 10 percent (MDNR 1996).

This mixture is consistent with BGE experience with the cost of power generation. As shown in Table 2.2-1, coal and nuclear operating costs, measured as expenses per kilowatt-hour of electricity generated, are comparable and are significantly less expensive than oil- and gas-fired generation. As was the case when CCNPP was first licensed, coal-fired generation represents a feasible alternative to nuclear generation. For this reason, Section 2.2.1.1 presents coal as a feasible alternative to CCNPP license renewal. Although BGE gas-fired generation unit costs are not competitive with BGE coal and nuclear operating costs, new gas-fired technology (combined cycle) offers significant efficiency improvements and operating cost reduction. For this reason, Section 2.2.1.2 presents gas-fired generation as a feasible alternative to CCNPP license renewal.

2.2.1 FEASIBLE ALTERNATIVES

The goal of Section 2.2.1 and the related environmental analyses in Section 4.2, is to provide NRC with sufficient information about feasible alternatives to CCNPP license renewal for NRC to be able to consider the environmental consequences of renewal relative to environmental consequences of the alternatives. For the purpose of this environmental report, the alternatives are presented as construction at the existing CCNPP site. This was done primarily in recognition of siting constraints imposed by the cooling water needs for a fossil-fuel-fired facility large enough to replace the CCNPP capacity. Use of a once-through cooling system is feasible only by siting on a water body the size of the Chesapeake Bay; assuming such siting facilitates inclusion of comparison between once-through and closed-cycle cooling technologies. However, although the alternatives are presented as defined construction at a defined site, the sections also discuss how design and site variations could affect the alternative definition and the resulting environmental consequences.

2.2.1.1 Coal-Fired Generation

For the purposes of this environmental report, it is assumed that it would take 1,800 megawatts electric coal-fuel-fired generation to replace the 1,730 megawatts electric CCNPP nuclear plant. Some increase in size would be necessary to offset increased internal electrical usage for pollution control and for pumping water or transporting coal or ash up-gradient, for example. Actual equivalency, however, could not be determined absent engineering design studies that have not been performed.

The CCNPP coal-fired alternative would consist of three 600-megawatt-electric units that would burn pulverized coal. Each unit would have low nitrogen oxide burners and low excess air firing, fabric filters or electrostatic precipitators, a lime/limestone flue gas desulfurization system (90 percent scrubber removal efficiency), and an approximately 600-foot high stack. A maximum of 5,400 tons of coal and

300 tons of lime/limestone per day per unit would be delivered by barge (assuming coal heating value of 13,000 British thermal units per pound, ash content 10 percent, sulfur content 1.6 percent). The power block and coal pile would occupy approximately 300 acres. Particulate, nitrogen oxide, and sulfur oxide emissions would be [TBD] tons per year, respectively.

The plant would use the existing CCNPP intake and discharge structures as part of a once-through cooling system. Although coal-fired plants require less cooling water than nuclear plants per megawatt, due to the slightly increased size of the coal-fired alternative it is assumed that the coal-fired alternative cooling water volume and temperature rise would be approximately the same as for the current nuclear plant (2,600 million gallons per day with 12 degree Fahrenheit temperature rise). The alternative closed-cycle system would also use the existing intake and discharge structures but would also have a 675- to 700-foot high natural draft cooling tower for each unit, with a cooling water consumption of approximately 26 million gallons per day at a minimum of two concentrations for cooling tower blowdown.

Approximately 1.6 million tons per year of waste (ash and scrubber sludge) would be disposed of onsite, requiring a plant lifetime (40 years) total of approximately 600 acres. The existing switchyard and transmission system would be used. The workforce during the 8-year construction period is expected to average 1,500, with a peak of 2,000, and during operations to average 400.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES AND MITIGATING ACTIONS

4.2 No-Action Alternative

NRC

"...the applicant shall discuss in this report the environmental impacts of alternatives..." 10 CFR 51.53(c)(2)

"...GEIS contains a discussion of the environmental impacts of alternative energy sources.... The information in the GEIS is available for use by the NRC and the licensee in performing the site-specific analysis of alternatives..." Supplementary information to the final rule, 61 FR 28467 - 28497, June 5, 1996, at Section III.B.3, page 28472, column 3.

4.2.1 COAL-FIRED GENERATION

Land Use

The coal-fired generation alternative would necessitate converting roughly an additional 900 acres of the CCNPP site to industrial use. Currently, some of this land is farmed and the rest is a revegetated dredged spoils disposal area. Additional land use would be attributable to mining necessary to supply 40 years worth of coal. These changes would noticeably alter current CCNPP land use patterns and would be a moderate impact.

The closed-cycle cooling system alternative would impact another 25 acres for cooling tower construction. Construction at a new site would impact roughly another 150 acres for offices, roads, parking areas, and a switchyard. Another 1,200 acres for transmission lines (assuming plant is sited 10 miles from nearest inter-tie connection). Depending particularly on transmission line routing, these alternatives could result in moderate to large land use impacts.

Ecology

Siting at the existing CCNPP site would have little ecological impact due to the use of farmland and a dredged spoils disposal area and use an existing intake and discharge system to which the area aquatic ecology has become acclimated. Twenty years of CCNPP operational monitoring have demonstrated that ecological impacts would be small.

The closed-cycle cooling system alternative would further reduce operational aquatic ecology impacts but would introduce risk to vegetation, particularly tobacco crops, from salt drift. Construction at another site could significantly increase ecological impacts and would have to be reviewed for potential impact to threatened and endangered species. Even at an existing power plant site, adding the CCNPP alternative coal-fired generation would introduce construction impacts and new, albeit incremental, operational impacts. At a greenfield site, in an undisturbed area, the impacts would certainly alter the ecology. These ecological impacts could be moderate to large.

Aesthetics

The three power plant structures, which could be as much as 200 feet tall, would be visible over intervening trees for miles around, particularly in both directions along the reach of the Chesapeake Bay. The three 600-foot tall stacks could be visible as far away as Annapolis, at a distance of 40 miles. This

view would contrast strongly with what is otherwise a natural-appearing rural area, with woods and farming areas, and would be a large visual aesthetic impact. Coal-fired generation would also introduce additional mechanical sources of noise (e.g., induced-draft fans and coal handling equipment) that would be audible offsite.

The closed-cycle cooling system alternative would further increase aesthetic impacts by adding three 700-foot cooling towers and associated plumes. Alternative locations could reduce the aesthetic impact of coal-fired generation if siting was in an area that was already industrialized. In such a case, however, the introduction of such tall stacks and cooling towers would probably still have a moderate incremental impact. Although the environmental report is assuming use of natural draft towers as an alternative technology, mechanical draft towers are also available. Such devices, being only 50 to 100 feet tall, would reduce the visual impact of natural draft towers. Mechanical draft towers, however, introduce another noise source.

Water Quality

Because the coal-fired generation alternative is assumed to use the existing CCNPP intake and discharge structures and share water flow and temperature characteristics, water quality impacts would continue to be small. The reduced workforce size (1,970 to 400) would reduce groundwater withdrawals for potable water use, but the existing groundwater impact is already small (Section 4.1.5). Leachate from coal storage areas and waste disposal areas would have to be controlled to avoid groundwater contamination.

The closed-cycle cooling system alternative would introduce cooling tower blowdown that would be at least two and one half times as saline as the Chesapeake Bay but, because of the reduced flow, water quality impacts should still be small.

Air Quality

Air quality impacts of coal-fired generation would be moderate to large. Introducing particulate, nitrogen oxide, and sulfur oxide emissions of [TBD] tons per year would necessitate obtaining offsets [to be verified]. Coal handling equipment would introduce fugitive particulate emissions; coal piles are radioactive and coal combustion releases radionuclides and other hazardous air pollutants. These impacts would be moderate to large.

Siting the coal-fired generation elsewhere would not significantly change air quality impacts, although it could necessitate installing more or less stringent pollution control equipment to meet applicable standards. The impacts would still be moderate to large.

Waste

Coal combustion generates waste in the form of ash, and air pollution control equipment generates additional ash and scrubber sludge. Approximately 1.6 million tons of this waste would be generated annually for 40 years and disposed of onsite, accounting for 600 of the 900 acres of land use. This is a moderate impact that could extend well after the 40-year operation life because revegetation management and groundwater monitoring for leachate contaminant impacts could be a permanent requirement. This impact would be moderate to large. Siting elsewhere would not alter waste generation, although other sites might have more constraints on disposal locations.

Human Health

Coal-fired generation introduces worker risks from fuel and lime/limestone mining and worker and public risks from fuel and lime/limestone transportation and stack emissions inhalation. Stack impacts can be very widespread and health risks difficult to quantify. This alternative also introduces the risk of coal fires and attendant inhalation risks. Overall, however, these risks are small.

Socioeconomics

It is assumed that coal-fired construction would take place while the CCNPP nuclear plant continues operation, finishing at the time that the nuclear plant would halt operations. Therefore, for the 6-year construction period, the site would have between 1,500 and 2,000 additional workers. During this time, the surrounding communities would experience demands on housing and public services that could have large impacts. After construction, the communities would be impacted by the loss of jobs; construction workers would leave, the nuclear plant workforce (1,970) would decline through a decommissioning period to a minimal maintenance size, and the coal-fired plant would introduce only 400 new jobs. Socioeconomic impacts from start of construction through nuclear plant decommissioning would be moderate to large.

Construction at another site would relocate some socioeconomic impacts but would not eliminate them; the community around CCNPP would still experience the impact of job CCNPP operational job loss and

1 the communities around the new site would have to absorb the impacts of a large, temporary workforce
2 and a moderate, permanent workforce.

3 **Cultural**

4 Coal-fired generation at CCNPP would not affect cultural resources. Construction at another site could
5 necessitate instituting cultural resource preservation measures (power block area or transmission line
6 right-of-way), but impacts can generally be managed and maintained as small.

7

1 **Table 2.2-1.** BGE fuel types cost of operation.

Primary type of fuel	Expenses per net kilowatt-hour	Plant name	Kind of plant	Normal mode of operation
Nuclear	\$0.0190	CCNPP	Nuclear	Baseload
Coal	\$0.0168	Conemaugh	Steam	Baseload
Coal	\$0.0184	Brandon Shores	Steam	Baseload
Coal	\$0.0193	Keystone	Steam	Baseload
Coal	\$0.0233	Crane	Steam	Baseload
Coal	\$0.0269	Wagner	Steam	Baseload
Natural gas	\$0.0617	Westport	Combustion turbine	Peaking
Natural gas	\$0.0630	Notch Cliff	Combustion turbine	Peaking
Natural gas	\$0.1393	Riverside 4	Steam	Intermediate
Oil	\$0.0546	Gould Street	Steam	Intermediate
Oil	\$0.0858	Perryman	Combustion turbine	Peaking
Oil	\$0.1051	Wagner	Combustion turbine	Intermediate
Oil	\$0.1162	Crane	Combustion turbine	Peaking
Oil	\$0.1314	Riverside 6-8	Combustion turbine	Peaking
Oil	\$0.1323	Keystone	Internal combustion	Peaking
Oil	\$0.1732	Conemaugh	Internal combustion	Peaking

2
3 Source: Modified from BGE (1995).

REFERENCES

- 1
- 2
- 3 BGE (Baltimore Gas and Electric Company), 1995, FERC Form No. 1: Annual Report of Major Electric
- 4 Utilities, Licensees and Others, May.
- 5 MDNR (Maryland Department of Natural Resources), 1996, *Maryland Power Plants and The*
- 6 *Environment*, Maryland Power Plant Siting Program, Annapolis, Maryland, May.

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