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Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3

Final Report

U.S. Nuclear Regulatory Commission
Office of New Reactors
Washington, DC 20555-0001

U.S. Army Corps of Engineers
U.S. Army Engineer District, Baltimore
Baltimore, MD 21203-1715

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Abstract

This environmental impact statement (EIS) has been prepared to satisfy the requirements of the National Environmental Policy Act of 1969, as amended (NEPA). This EIS has been prepared in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by UniStar Nuclear Development, LLC, on behalf of Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, (collectively known as UniStar) for a combined construction permit and operating license (combined license or COL). UniStar also submitted a joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland to the U.S. Army Corps of Engineers (USACE or Corps) and the Maryland Department of the Environment (MDE). The proposed actions related to the UniStar applications are (1) NRC issuance of a COL for a new power reactor unit (Unit 3) at the Calvert Cliffs Nuclear Power Plant (CCNPP) in Calvert County, Maryland, and (2) Corps permit action on a Department of the Army (DA) Individual Permit application to perform certain activities on the site. The Corps is participating with the NRC in preparing this EIS as a cooperating agency and participates collaboratively on the review team.

This EIS includes the analysis by the NRC and the Corps staff that considers and weighs the environmental impacts of constructing and operating a new nuclear unit at the Calvert Cliffs site and at alternative sites and mitigation measures available for reducing or avoiding adverse impacts. This EIS also addresses consultation for Federally listed species, cultural resources, and essential fish habitat (EFH).

This EIS includes the evaluation of the proposed project's impacts to waters of the United States pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The Corps will base its evaluation of the DA Individual Permit application on the requirements of Corps regulations, the Clean Water Act Section 404(b)(1) Guidelines, and the Corps public interest review (PIR) process.

After considering the environmental aspects of the proposed NRC action, the NRC staff's recommendation to the Commission is that the COL be issued as requested. This recommendation is based on (1) the application, including the Environmental Report (ER), submitted by UniStar and responses to requests for additional information (RAI); (2) consultation with Federal, State, Tribal, and local agencies; (3) the staff's independent review; (4) the staff's consideration of public comments related to the environmental review that were received during the public scoping process and on the draft EIS; and (5) the assessments summarized in this EIS, including the potential mitigation measures identified in the ER and this EIS. The Corps permit decision will be made following issuance of this final EIS.

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Executive Summary

By letter dated July 13, 2007, the U.S. Nuclear Regulatory Commission (NRC) received a partial application from UniStar Nuclear Development, LLC, on behalf of Constellation Generation Group, LLC and UniStar Nuclear Operating Services, LLC (collectively known as UniStar), for a combined construction permit and operating license (combined license or COL) for Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 to be located adjacent to the existing Units 1 and 2 in Calvert County, Maryland. Part 1 of the application contained the applicant's Environmental Report (ER) and site suitability information and was accepted on January 25, 2008. Part 2, which contained the balance of information required for a COL application, was received on March 14, 2008, and was accepted on June 3, 2008. On July 7, 2008, Constellation Generation Group, LLC withdrew as an applicant and Calvert Cliffs 3 Nuclear Project, LLC joined as an applicant. The application was supplemented by letters between June 2008 and September 2009. Revision 6 of the application was submitted on September 30, 2009. The NRC staff's review as documented in the draft environmental impact statement (EIS) was based on Revision 6 of the application, UniStar's responses to staff's requests for additional information (RAI), and supplemental letters from the applicant. Revision 7 of the ER was submitted on December 20, 2010. Revision 7 and supplemental letters from UniStar are the basis for the updated material in this EIS.

On May 16, 2008, UniStar submitted a joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland to the U.S. Army Corps of Engineers (USACE or Corps) and the Maryland Department of the Environment (MDE). The Corps application number is NAB-2007-08123-M05 (Calvert Cliffs 3 Nuclear Project, LLC/UniStar Nuclear Operating Service, LLC), on behalf of co-applicants, Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC. The MDE Tidal Application number is Calvert Cliffs 3 Nuclear Project, LLC/200862371/08-WL-1462. The MDE Nontidal Application number is Calvert Cliffs 3 Nuclear Project, LLC/200862335/08-NT-0191.

The proposed actions related to the Calvert Cliffs Unit 3 applications are (1) NRC issuance of a COL for construction and operation of a new nuclear unit at the Calvert Cliffs site and (2) Corps permit action on a Department of the Army (DA) Individual Permit application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Appropriation Act of 1899. The U.S. Environmental Protection Agency (EPA) has the authority to review and veto Corps decisions of Section 404 permits. The Corps is participating with the NRC in preparing this EIS as a cooperating agency and participates collaboratively on the review team.

Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), directs that an EIS be prepared for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in Title 10 of the Code of

Federal Regulations (CFR) Part 51. Further, in 10 CFR 51.20, the NRC has determined that the issuance of a COL under 10 CFR Part 52 is an action that requires an EIS.

The purpose of UniStar's requested NRC action is to obtain a COL to construct and operate a baseload nuclear power plant. This license is necessary but not sufficient by itself for construction and operation of the unit. A COL applicant must obtain and maintain the necessary permits from other Federal, State, and local agencies and permitting authorities. Therefore, the purpose of the NRC's environmental review of the UniStar application is to determine the impacts on the human environment if one new nuclear power plant of the proposed U.S. EPR design is constructed and operated at the Calvert Cliffs site. The purpose of UniStar's requested Corps action is to obtain a DA permit decision on the Individual Permit application to construct the proposed structures in and under navigable waters and to discharge dredged, excavated, and/or fill material into waters of the United States, including jurisdictional wetlands.

Upon acceptance of Part 1 of the UniStar application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a Notice of Intent (73 FR 8719) to prepare an EIS and conduct scoping in the *Federal Register* (FR). On March 19, 2008, the NRC held two scoping meetings in Solomons, Maryland, to obtain public input on the scope of the environmental review. To gather information and to become familiar with the proposed and alternative sites and their environs, the NRC and its contractor, Pacific Northwest National Laboratory (PNNL), visited the Calvert Cliffs site in March 2008 and the alternative site, the former Thiokol brownfield site, in October 2008. The NRC, PNNL, and the Corps visited the alternative sites Eastalco and Bainbridge in August 2009. During the site visits, the NRC, PNNL, and the Corps staff met with UniStar staff and public officials. During the scoping process, the NRC staff reviewed the comments received and contacted Federal, State, Tribal, regional, and local agencies to solicit comments.

Included in this EIS are (1) the results of the joint NRC/Corps review team's analyses, which consider and weigh the environmental effects of the NRC's proposed action (i.e., issuance of the COL) and of constructing and operating a new nuclear unit at the Calvert Cliffs site; (2) mitigation measures for reducing or avoiding adverse effects; (3) the environmental impacts of alternatives to the proposed action; and (4) the staff's recommendation regarding the proposed action.

To guide its assessment of the environmental impacts of a proposed action or alternative actions, the NRC has established a standard of significance for impacts based on Council on Environmental Quality (CEQ) guidance. Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, provides the following definitions of the three significance levels – SMALL, MODERATE, or LARGE:

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

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

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

Potential mitigation measures were considered for each resource category and are discussed in the appropriate sections of the EIS.

In preparing this EIS, the review team reviewed the applications, including the ER submitted by UniStar; consulted with Federal, State, Tribal, and local agencies; and followed the guidance set forth in NUREG-1555, *Environmental Standard Review Plan* (ESRP) and staff memorandum "Addressing Construction and Preconstruction, Greenhouse Gas Issues, General Conformity Determinations, Environmental Justice, Need for Power, Cumulative Impact Analysis, and Cultural/Historical Resources Analysis Issues in Environmental Impact Statements." In addition, the review team considered the public comments related to the environmental review received during the scoping process. Comments within the scope of the environmental review are included in Appendix D of this EIS.

A 75-day comment period began on April 26, 2010, when EPA issued a Notice of Availability (75 FR 21625) of the draft EIS to allow members of the public to comment on the results of the environmental review. Two public meetings were held on May 25, 2010, in Solomons, Maryland. These meetings also served as the Corps' public hearing to acquire information or evidence that will be considered in evaluating a proposed DA Individual Permit. During these public meetings, the review team described the results of the NRC environmental review, answered questions related to the review, and provided members of the public with information to assist them in formulating their comments. The comment period on the draft EIS ended July 9, 2010. Comments on the draft EIS and the staff's responses are provided in Appendix E of this EIS.

The NRC staff's recommendation to the Commission related to the environmental aspects of the proposed action is that the COL be issued as requested. This recommendation is based on (1) the applications, including the ER submitted by UniStar and the applicant's supplemental letters and responses to staff's RAIs; (2) consultation with Federal, State, Tribal, and local agencies; (3) the staff's independent review; (4) the staff's consideration of public comments related to the environmental review that were received during the scoping process and on the draft EIS; and (5) the assessments summarized in this EIS, including the potential mitigation measures identified in the ER. The Corps will base its evaluation of the DA Individual Permit application on the requirements of Corps regulations, the Clean Water Act Section 404(b)(1) Guidelines, and the Corps public interest review (PIR) process. The Corps permit decision will be made following issuance of the final EIS.

The NRC staff's evaluation of the site safety and emergency preparedness aspects of the proposed action will be addressed in the NRC's final Safety Evaluation Report (SER), currently anticipated to be published in January 2013. The reactor specified in the application is the AREVA NP Inc.'s U.S. EPR design, which is currently undergoing a design certification review. The NRC staff's evaluation of the design certification and final rulemaking is currently anticipated to be completed in February 2013.

Abbreviations/Acronyms

χ/Q	dispersion values
°C	degree(s) Celsius
°F	degree(s) Fahrenheit
ac	acre(s)
ACHP	Advisory Council on Historic Preservation
ADAMS	Agencywide Documents Access and Management System
AEC	U.S. Atomic Energy Commission
ALARA	as low as reasonably achievable
ANC	acid neutralizing capacity
ANSI	American National Standards Institute
APE	Area(s) of Potential Effects
AREVA	AREVA NP Inc.
AQCR	Air Quality Control Region
B&O	Baltimore and Ohio
BA	biological assessment
BACT	best available control technology
BAT	best available technology
BEA	U.S. Department of Commerce Bureau of Economic Analysis
BEIR	Biological Effects of Ionizing Radiation
BGE	Baltimore Gas and Electric Company
B-IBI	Benthic Index of Biotic Integrity
BMP	best management practice(s)
Bq	becquerel(s)
BRAC	base realignment and closure
Btu	British thermal unit
C&O	Chesapeake and Ohio
CAC	Maryland Critical Area Commission
CAES	compressed air energy storage
CBCA	Chesapeake Bay Critical Area
CBP	Chesapeake Bay Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CCPS	Calvert County Public Schools
CCWS	component cooling water system
CDC	Centers for Disease Control and Prevention
CDF	core damage frequency

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
Ci	curies
cm	centimeters
CMH	Calvert Memorial Hospital
CO	carbon monoxide
CO_2	carbon dioxide
COL	combined license
COMAR	Code of Maryland Regulations
Constellation	Constellation Energy Nuclear Group, LLC
Corps	U.S. Army Corps of Engineers (also USACE)
CPCN	Certificate of Public Convenience and Necessity
CWIS	cooling water intake structure
CWMA	Cooperative Wildlife Management Area
CWP	Center for Watershed Protection
CWS	circulating water supply system
CZMA	Coastal Zone Management Act
d	day
D/Q	deposition values
DA	Department of the Army
dB	decibel(s)
dBA	decibel(s) (acoustic)
DBA	design basis accident(s)
DC	District of Columbia
DECOM	decommissioning
DNR	(Maryland) Department of Natural Resources
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DPS	distinct population segments
EA	environmental assessment
EAB	exclusion area boundary
EDG	emergency diesel generators
EFH	essential fish habitat
EIA	Department of Energy's Energy Information Administration
EIS	environmental impact statement
ELF	extremely low frequency

EMF	electromagnetic field(s)
EMS	Emergency Medical Services
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EPT	Ephemeroptera-Plecoptera-Trichoptera
EPZ	emergency planning zone
ER	Environmental Report
ESA	Endangered Species Act of 1973, as amended
ESRP	*Environmental Standard Review Plan*
ESWS	essential service water system
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWG	Fisheries Hydroacoustic Working Group
FIDS	forest interior dwelling species
fps	feet per second
FR	*Federal Register*
FSAR	Final Safety Analysis Report
ft	foot/feet
ft^2	square feet
ft^3	cubic feet
FTE	full-time equivalent
FWS	U.S. Fish and Wildlife Service
FWPCA	Federal Water Pollution Control Act
FY	fiscal year
g	gram(s)
GAI	GAI Consultants, Inc.
gal	gallon(s)
GC	gas centrifuge
GCC	global climate change
GCRP	U.S. Global Change Research Program
GD	gaseous diffusion
GEIS	generic environmental impact statement
GHG	greenhouse gas
GI-LLI	adult lower intestine
GIS	geographical information system
GIT	Georgia Institute of Technology
gpd	gallon(s) per day

gpm	gallon(s) per minute
ha	hectare(s)
HAP	hazardous air pollutants
HDD	horizontal directional drilling
HLW	high level waste
HQUSACE	Headquarters, U.S. Army Corps of Engineers
hr	hour
Hz	hertz
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IDA	Intensely Developed Area(s)
IGCC	integrated gasification combined cycle
in.	inch(es)
INEEL	Idaho National Engineering and Environmental Laboratory
IRSA	interim resin storage area
ISFSI	independent spent fuel storage installation
Kcal	kilocalorie
kg	kilogram
km	kilometer(s)
km^2	square kilometer(s)
kV	kilovolt(s)
kW(e)	kilowatts electric
kWh	kilowatt hour(s)
L	liter(s)
lb	pound(s)
LDAs	Limited Development Areas
LEAs	Local Educational Agencies
LEDPA	least environmentally damaging practicable alternative
LF	linear feet
LFAA	Low Flow Allocation Agreement
LLW	low-level waste
LNG	liquefied natural gas
LOS	level of service
LPZ	low population zone
LRF	large release frequencies
LWR	light-water reactor

m	meter(s)
m^2	square meter
m^3	cubic meter(s)
mA	milliamperes
MAB	Middle Atlantic Bight
MACCS2	MELCOR Accident Consequence Code System
MAPP	Mid-Atlantic Power Pathway
mCi	millicuries
MBTA	Migratory Bird Treaty Act
MD	Maryland
MBSS	Maryland Biological Stream Survey
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MDSDAT	Maryland State Department of Assessments and Taxation
MEA	Maryland Energy Administration
MEI	maximally exposed individual
mg	milligram(s)
MGD	million gallon(s) per day
mGy	milligray
MHT	Maryland Historical Trust
MHW	mean high water
mi	mile(s)
mi^2	square mile(s)
MISO	Midwest Independent Transmission System Operator, Inc.
MIT	Massachusetts Institute of Technology
mL	millilitres
mm	millimetres
MMS	Minerals Management Service
mo	month
MOA	memorandum of agreement
MOU	memorandum of understanding
MP	management plan
mph	mile(s) per hour
MPSC	Maryland Public Service Commission
mR	milliroentgen
mrad	millirad(s)
mrem	millirem(s)
MSA	Metropolitan Statistical Area
MSL	mean sea level

mSv	millisievert(s)
MSX	Multinucleate Sphere X
MT	metric ton(s) (or tonne[s])
MTU	metric ton of uranium
MVA	motor vehicle accidents
MW	megawatt(s)
MW(e)	megawatt(s) electric
MW(t)	megawatt(s) thermal
MWd	megawatt-day(s)
MWh	megawatt hour(s)
NA	Not Applicable
NAGPRA	Native American Graves Protection & Repatriation Act
NA-NSR	Nonattainment New Source Review
NCES	National Center for Education Statistics
NCI	National Cancer Institute
NCRP	National Council on Radiation Protection and Measurements
NEPA	National Environmental Policy Act of 1969, as amended
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NETL	National Energy Technology Laboratory
NHPA	National Historic Preservation Act of 1966, as amended
NIEHS	National Institute of Environmental Health Sciences
NIST	National Institute of Standards and Technology
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOB	Natural Oyster Bar
NO_x	nitrogen oxide(s)
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NSR	New Source Review
NUREG	NRC publication
NWI	National Wetlands Inventory
NYSDEC	New York State Department of Environmental Conservation
OCS	outer continental shelf

ODCM	Offsite Dose Calculation Manual
OHW	ordinary high water
OSHA	Occupational Safety and Health Administration
Pa	pascal
PATH	Potomac-Appalachian Transmission Highline Project
Pepco	Potomac Electric Power Company
PCB	polychlorinated biphenyls
pCi	picocuries
PDCC	Port Deposit Chamber of Commerce
PIR	public interest review
P-IBI	phytoplankton index of biotic integrity
PJM	PJM Interconnection, LLC
PM	particulate matter
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter of 10 microns or less
PNNL	Pacific Northwest National Laboratory
PPRP	Maryland Power Plant Research Program
ppt	parts per thousand
PRA	probabilistic risk assessment
PSD	prevention of significant deterioration
PWR	pressurized water reactor(s)
rad	radiation absorbed dose
RAI	request for additional information
RCA	resource conservation area(s)
RCP	reinforced concrete pipe
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RCS	reactor coolant system
rem	Roentgen equivalent man (a special unit of radiation dose)
REMP	radiological environmental monitoring program
RFC	Reliability*First* Corporation
RIMS	Regional Input-Output Multiplier System
ROD	Record of Decision
ROI	region of interest
ROW	rights-of-way
RSICC	Radiation Safety Information Computational Center
Ryr	reactor year
s	second(s)
S	south

SE	southeast
SAMA	severe accident mitigation alternative(s)
SAMDA	severe accident mitigation design alternative(s)
SAV	submerged aquatic vegetation
SBO	station blackout
SCR	selective catalytic reduction
SEL	sound exposure level
SER	Safety Evaluation Report
SHA	State Highway Administration
SHPO	State Historic Preservation Office(r)
SMCMC	St. Mary's County Metropolitan Commission
SO_2	sulfur dioxide
SO_x	sulfur oxide(s)
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
Sv	sievert(s)
SWPPP	Stormwater Pollution Prevention Plan
TAP	toxic air pollutant(s)
TDS	total dissolved solids
TEDE	total effective dose equivalent
TIA	Traffic Impact Analysis
TLD	thermoluminescent dosimeter(s)
TMDL	total maximum daily load
TOC	total organic carbon
TRU	Transuranic waste
TSP	total suspended particulates
TSS	total suspended solids
U.S.	United States
U.S. EPR	the proposed Unit 3 reactor design
U_3O_8	triuranium octaoxide ("yellowcake")
UHS	ultimate heat sink
UMTRI	University of Michigan Transportation Research Institute
UniStar	UniStar Nuclear Operating Services, LLC and Calvert Cliffs 3 Nuclear Project, LLC (collective applicant)
UO_2	uranium(IV) oxide
USACE	U.S. Army Corps of Engineers (also Corps)
USBLS	United States Bureau of Labor Statistics
U.S.C.	United States Code
USCB	U.S. Census Bureau

USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VA	Virginia
VIMS	Virginia Institute of Marine Science
VOC	volatile organic compound(s)
WHO	World Health Organization
WNA	World Nuclear Association
WV	West Virginia
WWTP	wastewater treatment plant(s)
yd	yard
yd^3	cubic yards
YMCA	Young Men's Christian Association
yr	year(s)
yr^{-1}	per year

Appendix A

Contributors to the Environmental Impact Statement

Appendix A

Contributors to the Environmental Impact Statement

The overall responsibility for the preparation of this environmental impact statement was assigned to the Office of New Reactors, U.S. Nuclear Regulatory Commission (NRC). The U.S. Army Corps of Engineers (Corps) is participating as a cooperating agency. The statement was prepared by members of the Office of New Reactors with assistance from other NRC organizations, the Corps, and Pacific Northwest National Laboratory.

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Lance Vail		Hydrology/System Alternatives
Corey Duberstein		Terrestrial Ecology
Roy Kropp		Aquatic Ecology
Michelle Niemeyer		Socioeconomics/Environmental Justice/Benefit-Cost
Tom Secrest		Socioeconomics and Environmental Justice
Tara O’Neil		Historic and Cultural Resources
J.V. Ramsdell, Jr.		Meteorology and Air Quality/Accidents
Philip Daling		Transportation
Lissa Staven		Radiation Protection/Health Physics/Decommissioning
Paul Hendrickson		Land Use/Need for Power/Energy Alternatives
Lara Aston		Nonradiological Health
David Payson		Technical Editing
Cary Counts		Technical Editing
Charity Plata		Technical Editing
Mike Parker		Text Processing
Christine Ross		Text Processing
Sharon Johnson		References
Tomiann Parker		References
Susan Gulley		References
Donna Austin-Workman		Graphics
Craig Allwardt		Comment Delineator
Terri Miley		Comment Delineator
AMEC EARTH & ENVIRONMENTAL, INC.		
Michael French		Cultural Resources

(a) Pacific Northwest National Laboratory is operated by Battelle for the U.S. Department of Energy.

Appendix B

Organizations Contacted

Appendix B

Organizations Contacted

The following Federal, State, regional, Tribal, and local organizations were contacted during the course of the U.S. Nuclear Regulatory Commission (NRC) staff's and the U.S. Army Corps of Engineers (Corps) independent review of potential environmental impacts from the construction and operation of one new nuclear unit (Unit 3) at the Calvert Cliffs site in Calvert County, Maryland:

Advisory Council on Historic Preservation, Washington, D.C.

Alcoa, Inc., Frederick, Maryland

Bainbridge Development Corp, Port Deposit, Maryland

Calvert County Department of Community Resources, Prince Frederick, Maryland

Calvert County Department of Economic Development, Prince Frederick, Maryland

Calvert County Department of Finance and Budget, Prince Frederick, Maryland

Calvert County Department of Planning and Zoning, Prince Frederick, Maryland

Calvert County Department of Public Safety, Prince Frederick, Maryland

Calvert County Department of Public Works, Prince Frederick, Maryland

Calvert County Emergency Management Office, Prince Frederick, Maryland

Calvert County Housing Authority, Prince Frederick, Maryland

Calvert County Minority Business Alliance, Huntingtown, Maryland

Calvert County Sheriff's Department, Prince Frederick, Maryland

Cedarville Band of Piscataway Indians, Inc., Waldorf, Maryland

Commission on African History and Culture, Annapolis, Maryland

Maryland Department of the Environment, Baltimore, Maryland

Maryland Department of Natural Resources, Annapolis, Maryland

Maryland Department of Transportation, Hanover, Maryland

Maryland Emergency Management Agency, Reisterstown, Maryland

Maryland Historical Trust, Crownsville, Maryland

Morgan State University, Estuarine Research Center

National Marine Fisheries Service, Annapolis, Maryland

National Marine Fisheries Service, Gloucester, Massachusetts

National Park Service, Washington, DC

New York State Department of Environmental Conservation, Bureau of Habitat, Albany, New York

Pennsylvania Fish and Boat Commission, Harrisburg, Pennsylvania

Pennsylvania Game Commission, Harrisburg, Pennsylvania

Piscataway Conoy Confederacy and Subtribes, Inc., La Plata, Maryland

Piscataway Indian Nation, Accokeek, Maryland

St. Mary's County Department of Economic & Community Development, Leonardtown, Maryland

St. Mary's County Department of Land Use & Growth Management, Leonardtown, Maryland

St. Mary's County Department of Social Services, Leonardtown, Maryland

Susquehanna River Basin Commission, Harrisburg, Pennsylvania

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, Road Sprinkler Fitters Local Union 669, Columbia, Maryland

United States Fish and Wildlife Service, Annapolis, Maryland

United Way of Calvert County, Prince Frederick, Maryland

Virginia Department of Game and Inland Fisheries, Richmond, Virginia

Virginia Marine Resources Commission, Newport News, Virginia

The following Federal, State, regional, Tribal, and local organizations were sent the U.S. Army Corps of Engineers public notice dated September 3, 2008, which solicited comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the proposed construction of one new nuclear unit (Unit 3) at the Calvert Cliffs site in Calvert County, Maryland:

Anne Arundel County, Maryland

Audubon Naturalist Society

Baltimore County, Maryland

Baltimore County Public Schools, Maryland

Blair County Conservation District, Pennsylvania

Calvert County, Maryland

Campaign to Reinvest in Oxon Hill

Carroll Citizens

Carroll County, Maryland

Charles County, Maryland

Chesapeake Bay Foundation

Citizens to Save South Valley Park and Whetstone Run, Maryland

City of Alexandria, Virginia

City of Baltimore, Maryland

City of Greenbelt, Maryland

City of Rockville, Maryland

City of Sunbury, Pennsylvania

College of Southern Maryland

Conservancy for Charles County, Inc.

Earth Conservation Corps

Fairfax County, Virginia

Fairfax County Water Authority, Virginia

Federal Highway Administration

Garrett County, Maryland

Georgetown University Law Center

Government of the Commonwealth of Pennsylvania

Government of the District of Columbia

Government of the State of Delaware

Government of the State of Maryland

Harford County, Maryland

Herring Run Watershed Association, Baltimore, Maryland

Historic Preservation Trust of Lancaster County, Pennsylvania

Huntington Township, Pennsylvania

Kent County, Maryland

Luzerne Conservation District

Manheim Township, Lancaster County, Pennsylvania

Mattawoman Watershed Society, Inc.

Maryland Association of Soil Conservation Districts, Inc.

Maryland Bass Federation

Maryland Coastal Bays Program

Maryland Department of Business and Economic Development

Maryland Department of the Environment

Maryland Department of Health and Mental Hygiene

Maryland Department of Natural Resources

Maryland Department of Planning

Maryland Department of Transportation

Maryland Military Department

Maryland National Capital Building Industry Association

Montgomery County Sierra Club, Maryland

National Oceanic and Atmospheric Administration

National Park Service

National Trust for Historic Preservation

Naval Research Laboratory

Nuclear Regulatory Commission

Organization of American States

Pennsylvania Association of Soil Conservation Districts, Inc.

Prince George’s County Planning Department, Maryland

Queen Anne’s County, Maryland

Saint Mary’s County, Maryland

Somerset County, Maryland

Southern Maryland Electric Cooperative

Sparrows Point Action, Maryland

Talbot County, Maryland

Tri-County Regional Planning Commission, Harrisburg, Pennsylvania

United States Coast Guard

United States Department of Agriculture

United States Department of Energy

United States Department of Housing and Urban Development

United States Department of Transportation

United States Environmental Protection Agency

United States Fish and Wildlife Service

University of Maryland

University of Maryland Center for Environmental Science

Virginia Department of Conservation and Recreation

Virginia Department of Environmental Quality

Virginia Institute of Marine Science

Washington County, Maryland

West Shore Community Association, Maryland

Appendix C

Chronology of NRC and Corps Environmental Review Correspondence

Appendix C

Chronology of NRC and Corps Environmental Review Correspondence

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and UniStar, and other correspondence related to the NRC staff's environmental review, under Title 10 of the Code of Federal Regulations (CFR) Part 51, for a Combined License (COL) application for the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 near Lusby, Maryland. This application was submitted by UniStar Nuclear Development, LLC on behalf of Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (collectively referred to as UniStar). The appendix also includes correspondence between the U.S. Army Corps of Engineers (USACE or Corps) and UniStar relating to UniStar's request for a Department of the Army permit for wetland and shoreline development.

All documents, with the exception of those containing sensitive or safeguard information, are available through the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD, and are available electronically from the Public Electronic Reading Room found on the Internet at the following web address: http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the component of ADAMS. The ADAMS accession numbers for each document are included below.

July 13, 2007	Letter from Mr. R.M. Krich, UniStar, to NRC transmitting application for Combined License for the Calvert Cliffs Nuclear Power Plant (Accession No. ML071980294).
August 15, 2007	Federal Register Notice of Receipt and Availability of the partial COL application for Calvert Cliffs Nuclear Power Plant (72 FR 45832).
December 14, 2007	Letter from Mr. R. M. Krich to NRC transmitting revision 1 of the application for a Combined License for the Calvert Cliffs Nuclear Power Plant (Accession No. ML073520191).
January 25, 2008	Letter from Mr. David B. Matthews, NRC, to Mr. R.M. Krich, UniStar, accepting and docketing the partial COL application for Calvert Cliffs Nuclear Power Plant (Accession No. ML080160547).

January 25, 2008	Press Release No. 08-013: NRC Accepts Partial Application for New Reactor at Calvert Cliffs (Accession No. ML080250401).
January 31, 2008	Federal Register Notice of Acceptance for Part 1 of the COL application for Calvert Cliffs Nuclear Power Plant (73 FR 5877).
February 5, 2008	Letter from Mr. Thomas Fredrichs, NRC, to Mr. Robert Gatton, Calvert Library Southern Branch, regarding maintenance of reference materials for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080290168).
February 5, 2008	Letter from Mr. Thomas Fredrichs, NRC, to Ms. Pamela Perrygo, Calvert Library Prince Frederick, regarding maintenance of reference materials for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080290195).
February 7, 2008	Letter from Mr. James E. Lyons, NRC, to Mr. John E. Price, UniStar, transmitting Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Related to a Combined License for Calvert Cliffs Nuclear Power Plant (Accession No. ML080390115).
February 14, 2008	Federal Register Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process for the partial Calvert Cliffs Nuclear Power Plant Combined License Application (73 FR 8719).
February 15, 2008	Telecom Summary between the NRC and Maryland Historic Trust (Accession No. ML091350331).
February 20, 2008	Telecom Summary between the NRC and Maryland Historic Trust (Accession No. ML080730294).
February 28, 2008	Press Release No. 08-039: NRC Meeting with Public March 19 on Environmental Issues for Calvert Cliffs New Reactor Application (Accession No. ML080590136).
February 29, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Don Klima, Advisory Council on Historic Preservation, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080430649).

February 29, 2008	Letter from Mr. Richard Raione, NRC, to Ms. Patricia Kurkul, NOAA National Marine Fisheries Service, regarding request for participation in environmental scoping process and a list of protected species within the area under evaluation for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080370414).
February 29, 2008	Letter from Mr. Richard Raione, NRC, to Mr. J. Rodney Little, Director and State Historic Preservation Officer, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080430656).
February 29, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Dan Murphy, U.S. Fish and Wildlife Service, regarding request for participation in the environmental scoping process and a list of protected species within the area under evaluation for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080390482).
March 3, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Douglas J. Austin, Pennsylvania Fish and Boat Commission, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080520182).
March 3, 2008	Letter from Mr. Richard Raione, NRC, to The Honorable Natalie Proctor, Cedarville Band of Piscataway Indians, Inc., regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080570335).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Steven G. Bowman, Virginia Marine Resources Commission, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080520160).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Robert W. Duncan, Virginia Department of Game and Inland Fisheries, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080520092).

March 5, 2008	Letter from Mr. Richard Raione, NRC, to Mr. John R. Griffin, Maryland Department of Natural Resources, regarding request for participation in the scoping process for the Calvert Cliffs Nuclear Power Plant combined license application review (Accession No. ML080450160).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to Ms. Tonya Hardy, Commission on African History and Culture, regarding request for participation in the scoping process for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080570370).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to Mr. Carl Roe, Pennsylvania Game Commission, regarding request for participation in the scoping process for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080520172).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to The Honorable Mervin Savory, Piscataway Conoy Confederacy and Subtribes, regarding request for participation in the scoping process for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080510408).
March 5, 2008	Letter from Mr. Richard Raione, NRC, to The Honorable William “Red Wing” Tayac, Piscataway Indian Nation, regarding request for participation in the scoping process for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML080570294).
March 5, 2008	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Richard Raione, NRC, transmitting the Meeting Notice of Public Meeting to Discuss Environmental Scoping Process for the Calvert Cliffs Nuclear Power Plant Combined License Application (Accession No. ML080460479).
March 14, 2008	Letter from Mr. George Vanderheyden, UniStar, to NRC transmitting Revision 2 of the partial combined license application for Calvert Cliffs Nuclear Power Plant (Accession No. ML080990114).
April 3, 2008	Press Release No. 08-071: Corrected Scoping Comment End Date for Calvert Cliffs New Reactor Application (Accession No. ML080940321).

April 11, 2008	Letter from Ms. Margaret E. Gaffney-Smith, U.S. Army Corps of Engineers, to NRC regarding cooperating status on the Calvert Cliffs Nuclear Power Plant Environmental Impact Statement (Accession No. ML081130278).
April 16, 2008	Letter from Ms. Susan T. Gray, Maryland Department of Natural Resources, to NRC regarding the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML081130284).
April 18, 2008	Press Release No. 08-079: Complete Calvert Cliffs Application for New Reactor Available on NRC Website (Accession No. ML081090082).
April 25, 2008	Letter from Mr. John Rycyna, NRC, to Mr. George Vanderheyden, UniStar, acknowledging receipt of the combined license application for Calvert Cliffs Nuclear Power Plant (Accession No. ML081060307).
May 7, 2008	Letter from Dr. Mary J. Ratnaswamy, U.S. Fish and Wildlife Service, to Ms. Harriet Nash, NRC, providing information on endangered and threatened species within the project area for the Calvert Cliffs Nuclear Power Plant (Accession No. ML081340645).
May 8, 2008	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Richard Raione, NRC, transmitting the Summary of the Public Scoping Meeting to Support the Review of the Calvert Cliffs Nuclear Power Plant Combined License Application (Accession No. ML091690293).
May 13, 2008	Email from Mr. Thomas Fredrichs, NRC, to Mr. George Wrobel, UniStar, transmitting Requests for Additional Information for the Environmental Review of the Calvert Cliffs Combined License Application (Accession No. ML081430521).
May 16, 2008	Letter from Mr. Dimitri Lutchenkov, UniStar to the U.S. Army Corps of Engineers transmitting Joint Federal / State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland (Accession No. ML081840343).
May 20, 2008	Letter from Robin D. Leone, on behalf of UniStar, to the Maryland Public Service Commission, transmitting the Joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland for Calvert Cliffs (Accession No. ML093370101).

May 30, 2008	Letter from Mr. John E. Price, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, supplementing Joint Federal/State Application for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML093630079).
June 3, 2008	Letter from Mr. John Rycyna, NRC, to Mr. George Vanderheyden, UniStar, accepting and docketing Part 2 of the combined license application for Calvert Cliffs Nuclear Power Plant (Accession No. ML081510149).
June 4, 2008	Press Release No. 08-110: NRC Accepts Application for the New Reactor at Calvert Cliffs (Accession No. ML081560749).
June 9, 2008	Federal Register Notice of Acceptance for Part 2 of the combined license application for Calvert Cliffs Nuclear Power Plant (73 FR 32606).
June 10, 2008	Letter from Mr. George Vanderheyden, UniStar, to NRC transmitting the responses to the May 13, 2008 requests for additional information (Accession No. ML100040300.
June 11, 2008	Letter from Mr. Nilesh Chokshi, NRC, to Ms. Margaret E. Gaffney-Smith, U.S. Army Corps of Engineers, responding to cooperating agency status request for the Calvert Cliffs Nuclear Power Plant Environmental Impact Statement (Accession No. ML081570139).
July 10, 2008	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Richard Raione, NRC, transmitting the Trip Report for the Calvert Cliffs Environmental Site Audit from March 17-20, 2008 (Accession No. ML081900202).
July 10, 2008	Memo from Mr. Robert Tabisz, Maryland Department of the Environment, to Calvert Cliffs 3 Nuclear Project LLC and Bechtel Power Corporation regarding permit request (Accession No. ML093630084).
July 14, 2008	Letter from Mr. Dimitri Lutchenkov, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, providing supplemental information for Joint Federal / State Application (Accession No. ML091671199).
August 1, 2008	Letter from Ms. Robin D. Leone, Saul Ewing Attorneys at Law representing UniStar, to Ms. Terry J. Romine, Maryland Public Service Commission, transmitting revised information for the Certificate of Public Convenience and Necessity to Construct a Nuclear Power Plant at Calvert Cliffs (Accession No. ML091671372).

August 18, 2008	Letter from Mr. George Vanderheyden, UniStar, to NRC transmitting responses to environmental requests for additional information for the combined license application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML083480179).
August 20, 2008	Letter from Mr. George Wrobel, UniStar, to NRC transmitting Revision 3 of the Calvert Cliffs Combined License Application (Accession No ML082390786).
August 29, 2008	E-mail from Mr. Thomas Fredrichs, NRC, to Mr. George Wrobel, UniStar, transmitting feedback on UniStar responses to environmental requests for additional information for the combined license application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML082910710).
September 3, 2008	U.S. Army Corps of Engineers Public Notice for comment period for Calvert Cliffs Nuclear Power Plant (Accession No. ML082550288).
September 10, 2008	E-mail from Mr. Thomas Fredrichs, NRC, to Mr. George Wrobel, UniStar, transmitting supplemental terrestrial ecology requests for additional information for the combined license application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML082910713).
September 18, 2008	Letter from Mr. John Rycyna, NRC, to Mr. George Vanderheyden, UniStar, enclosing Notice of Hearing and Opportunity to Petition for Leave to Intervene and Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information (SUNSI) and Safeguards Information (SGI) for Contention Preparation on a Combined License for the Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML082530335).
September 19, 2008	E-mail from Mr. Thomas Fredrichs, NRC, to Mr. George Wrobel, UniStar, transmitting revised terrestrial ecology requests for additional information for the combined license application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML082910711).
September 19, 2008	Letter from Mr. George Vanderheyden, UniStar, to NRC transmitting Request for Additional Information Response related to LADTAP and GASPAR Files (Accession No. ML093370357).
September 22, 2008	Email from Mr. Jim Burkman, Constellation, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting revision 3 corrections to the work description for the Corps review (Accession No. ML091350328).

September 25, 2008	Comment form submitted by Maryland Historical Trust in response to U.S. Army Corps of Engineers public notice (Accession No. ML093630083).
September 26, 2008	Federal Register Notice of Hearing and Opportunity to Petition for Leave to Intervene and Order Imposing Procedures for Access to SUNSI and SGI for Contention Preparation on a Combined License for the Calvert Cliffs Nuclear Power Plant Unit 3 (73 FR 55876).
September 26, 2008	Press Release No. 08-178: NRC Announces Opportunity to Participate in the Hearing on the New Reactor Application for Calvert Cliffs (Accession No. ML082700493).
September 29, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting responses to supplemental aquatic ecology requests for additional information (Accession No. ML090420560).
September 30, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting updated response to environmental request for additional information (Accession No. ML082770047).
September 30, 2008	Letter from Mr. Leopoldo Miranda, U.S. Fish and Wildlife Service, to Colonel Peter W. Mueller, U.S. Army Corps of Engineers- Baltimore District, responding to public notice (Accession No. ML093630080).
October 3, 2008	Letter from Mr. John Nichols, NOAA, to Ms. Kathy Anderson, U.S. Army Corps of Engineers regarding the Calvert Cliffs Nuclear Power Plant combined operating license application environmental review (Application No. ML082910715).
October 9, 2008	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Andrew Kugler, NRC transmitting the Scoping Summary Report Related to the Environmental Scoping Process for the Calvert Cliffs Unit 3 Combined License Application Review (Accession No. ML093290199).
October 14, 2008	E-mail from Mr. John Rycyna, NRC, to Mr. George Wrobel, UniStar, transmitting supplemental environmental requests for additional information (Accession No. ML082900834).
October 17, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting responses to terrestrial ecology requests for additional information (Accession No. ML082960400).

October 21, 2008	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Gregory Hatchett, NRC, transmitting the Trip report from Calvert Cliffs intake structure and Thiokol Alternative site visits (Accession No. ML082910218).
October 23, 2008	Letter from Ms. Linda C. Janey, Maryland Department of Planning, to Mr. Dimitri Lutchenkov, UniStar, transmitting comments on the proposed Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML093630081).
October 27, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental responses to aquatic ecology requests for additional information (Accession No. ML083080068).
October 27, 2008	Letter from Mr. Dimitri Lutchenkov, UniStar, to the Ms. Kathy Anderson, U.S. Army Corps of Engineers, requesting a decision on wetlands permits to be made within 30 days of publication of the final environmental impact statement (Accession No. ML083230532).
October 28, 2008	Letter from Mr. William P. Seib, U.S. Army Corps of Engineers, to Mr. Thomas E. Roberts, Calvert Cliffs 3 Nuclear Project LLC, in response to application to build a nuclear power plant at the Calvert Cliffs site (Accession No. ML083170295).
October 31, 2008	Letter from Mr. Elder Ghigiarelli, Jr., Maryland Department of the Environment, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, regarding Section 401 Water Quality Certification for Calvert Cliffs Nuclear Power Plant (Accession No. ML093630082).
October 31, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting responses to environmental requests for additional information (Accession No. ML083110676).
October 31, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting response to request for additional information related to intake structure relocation affected sections in the combined license application (Accession No. ML0831008361).
November 11, 2008	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. William P. Seib, U.S. Army Corps of Engineers, transmitting responses to information needs detailed in October 28, 2008 letter (Accession No. ML091530687).

November 25, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting corrected revision 3 to the combined license application (Accession No. ML083470549).
December 4, 2008	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental response to environmental impact statement issue #5 (Accession No. ML083440067).
January 9, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental responses to hydrology requests for additional information (Accession No. ML090710106).
January 14, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting intake structure relocation changes for the Environmental Report (Accession No. ML090220368).
January 16, 2009	Letter from Mr. Joseph Colaccino, NRC, to Mr. Greg Gibson, UniStar, indicating a change in the schedule for the environmental review (Accession No. ML083570651).
January 20, 2009	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. William P. Seib, U.S. Army Corps of Engineers- Baltimore District, providing updated responses to questions on the Joint Federal/State Application (Accession No. ML093630095).
January 30, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting draft Unanticipated Discoveries Plan (Accession No. ML090350358).
February 3, 2009	Letter from Mr. Thomas L. Fredrichs, NRC, to Mr. Greg Gibson, UniStar, transmitting environmental requests for additional information (Accession No. ML083310256).
February 12, 2009	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. William P. Seib, U.S. Army Corps of Engineers in regards to multi-agency site visit on January 15 and 16, 2009 (Accession No. ML090620242).
February 13, 2009	Letter from Mr. J. Rodney Little, Maryland Historical Trust, to Mr. William P. Seib, U.S. Army Corps of Engineers regarding effects on cultural resources (Accession No. ML090570416).

February 18, 2009	Letter from Mr. Dimitri Lutchenkov, UniStar, to Ms. Amanda Sigillito, Maryland Department of the Environment, transmitting Phase I Compensatory Mitigation Plan for Non-Tidal and Stream Impacts associated with Calvert Cliffs Unit 3 (Accession No. ML093630094).
February 19, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental response to hydrology requests for additional information (Accession No. ML090550125).
February 27, 2009	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. William P. Seib, U.S. Army Corps of Engineers, transmitting responses to information needs detailed in October 28, 2008 letter (Accession No. ML091480200).
February 27, 2009	Telecom Summaries for Telecoms held with UniStar from February 13, 2009 to February 24, 2009 regarding Requests for Additional Information issued February 3, 2009 (Accession No ML090820698).
March 3, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting the Phase I Wetland/Stream Mitigation Plan (Accession No. ML093380593)
March 5, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC responding to environmental requests for additional information (Accession No. ML090710146).
March 9, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Revision 4 to the Combined License Application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML090860325).
March 16, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting schedule for revisions to the Combined License Application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML090770890).
March 17, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Steve Sanford, Bureau of Habitat, regarding request for participation in the scoping process for the environmental review of the Calvert Cliffs Nuclear Power Plant combined license application (Accession No. ML083400571).
March 23, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Greg Gibson, UniStar, regarding project manager change for the combined license environmental review for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML090700448).

March 23, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC responding to environmental requests for additional information (Accession No. ML090840149).
March 27, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC describing scope of Revision 5 to the Combined License Application for the Calvert Cliffs Nuclear Power Plant (Accession No. ML090900186).
March 30, 2009	Memo from Mr. Thomas Fredrichs, NRC, to Mr. Robert Schaaf, NRC, transmitting the Trip Report from Calvert Cliffs alternative site visits (Accession No. ML090650192).
April 2, 2009	Email from Mr. Chuck Nieder, New York Natural Heritage Program to Ms. Laura Quinn, NRC, regarding information request on the alternative sites located in New York State (Accession No. ML 091170694).
April 14, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC regarding restrictions of construction and refurbishment of the barge slip and unloading facility and associated dredging (Accession No. ML091060748).
April 22, 2009	Letter from Ms. Laura Quinn, NRC, to Mr. Greg Gibson, UniStar, transmitting supplemental environmental requests for additional information (Accession No. ML090580042).
April 24, 2009	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC transmitting the Meeting Notice for the Public Meeting to Discuss the Alternative Siting Process for the Proposed Calvert Cliffs Combined License Application for Unit 3 (Accession No. ML091180022).
April 27, 2009	Letter from Ms. Kelly P. Neff, Maryland Department of the Environment, to Mr. Dimitri Lutchenkov, UniStar, approving the Phase I Mitigation Plan for Calvert Cliffs Nuclear Power Plant (Accession No. ML091270980).
May 13, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting the Federal Fish and Wildlife Permit for Eagle Scientific Collecting (Accession No. ML091340643).
May 19, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting responses to environmental requests for additional information (Accession No. ML091410432).

May 22, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Biological Evaluation for Tiger Beetles (Accession No. ML091480389).
May 22, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting Mitigation Summary for National Register of Historic Places- Eligible Historic Properties (Accession No. ML091660537).
May 22, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting the Maryland Department of the Environment approval letter for the Calvert Cliffs Nuclear Power Plant Unit 3 Phase I Nontidal Wetlands Mitigation Plan (Accession No. ML091660577).
June 1, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC regarding Alternate Site Evaluation Report Submittal Schedule (Accession No. ML091540279).
June 2, 2009	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC transmitting the Meeting Summary of the Alternative Site Selection Process Meeting for the Calvert Cliffs Nuclear Power Plant Combined License Application (Accession No. ML091390621).
June 3, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC regarding request for Portable Document Format Meteorological Data (Accession No. ML091620273).
June 8, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting U.S. Department of Energy contract in response to environmental request for additional information (Accession No. ML091610666).
June 11, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC, transmitting figure in response to environmental request for additional information (Accession No. ML091690067).
June 30, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Revision 5 of the Calvert Cliffs Nuclear Power Plant Combined License Application (Accession No. ML0918805530).
July 15, 2009	Letter from Ms. Beth Bachur, U.S. Army Corps of Engineers, to Mr. Reid J. Nelson, Advisory Council on Historic Preservation, notifying the Council of a Memorandum of Agreement for the review of the Calvert Cliffs application (Accession No. ML0930602350).

July 17, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing revised alternate site evaluation (Accession No. ML092020313).
July 24, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing follow-up responses to environmental requests for additional information (Accession No. ML092150728).
July 24, 2009	Letter from Mr. Raymond Wallace, Advisory Council on Historic Preservation, to Ms. Beth E. Bachur, U.S. Army Corps of Engineers, regarding the Memorandum of Agreement for the Calvert Cliffs application review (Accession No. ML093060220).
July 29, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing follow-up responses to environmental requests for additional information (Accession No. ML092120061).
July 30, 2009	Letter from Ms. Beth E. Bachur, U.S. Army Corps of Engineers, to Mr. Michael Lesar, NRC, regarding the Corps' comments on the Phase I Stream and Wetland Mitigation Plan for the Calvert Cliffs project (Accession No. ML093240035).
July 31, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing follow-up responses to environmental requests for additional information (Accession No. ML092190635).
August 7, 2009	Email from Ms. Laura Quinn, NRC, to Mr. Dimitri Lutchenkov, UniStar, transmitting the Calvert Cliffs Site Audit Information Needs for the Revised Alternative Site Audit and Visit (Accession No. ML092340028).
August 20, 2009	Letter from Mr. Joseph Colaccino, NRC, to Mr. George Vanderheyden, UniStar, transmitting revised environmental schedule for the combined license application review for the Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML092190214).
August 27, 2009	Letter from Ms. Laura Quinn, NRC, to Mr. Greg Gibson, UniStar, transmitting Request for Additional Information Related to the Environmental Report for the Calvert Cliffs Combined License Application – Ozone Air Emissions during Construction and Operation (Accession No. ML092260454).

August 29, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing revision 1 of the alternate site evaluation and Environmental Report Chapter 9.3 (Accession No. ML092450557).
September 3, 2009	Letter from Ms. Laura Quinn, NRC, to Mr. Mark Stiffler, Alcoa Corporate Center, expressing appreciation for site tour of the Alcoa Eastalco Works Frederick, Maryland site (Accession No. ML092370676).
September 3, 2009	Letter from Ms. Laura Quinn, NRC, to Ms. Donna C. Tapley, Bainbridge Development Corporation, expressing appreciation for site tour of the former Bainbridge Naval Training Center site in Port Deposit, Maryland (Accession No. ML092390270).
September 10, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing input/output files from TRAGIS and RADTRAN programs for alternative sites (Accession No. ML092570249).
September 16, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Dimitri Lutchenkov, UniStar, regarding Calvert Cliffs Nuclear Power Plant combined license application online reference portal (Accession No. ML092520671).
September 17, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing follow-up response to environmental request for additional information (Accession No. ML092640140).
September 18, 2009	Letter from Ms. Laura Quinn, NRC, to Mr. Greg Gibson, UniStar, to NRC transmitting environmental requests for additional information on revised alternative sites (Accession No. ML092450423).
September 21, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC accepting terms of online reference portal operation (Accession No. ML092670169).
September 25, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing responses to environmental requests for additional information (Accession No. ML092730188).
September 25, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing response to environmental requests for additional information (Accession No. ML092730202).

September 25, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting the response to request for additional information number 1019 (Accession No. ML092730187).
September 25, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Beth Bachur, U.S. Army Corps of Engineers, transmitting the Summary of the Phase I Mitigation Plan for the Non-Tidal Wetland and Stream Impacts (Accession No. ML093380280).
September 30, 2009	Letter from Mr. Greg Gibson, UniStar to NRC transmitting Revision 6 of the Calvert Cliffs Nuclear Power Plant Combined License Application (Accession No. ML092880200).
October 2, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC providing schedule for completion of updated construction emissions analysis for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092800159).
October 9, 2009	Letter from Mr. Greg Gibson, UniStar, to Mr. J. Rodney Little, Director and State Historic Preservation Officer, providing Architectural and Historical Resources Field Documentation Update (Accession No. ML092870437).
October 14, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Marian Honeczy, Maryland Forest Service, transmitting the Forest Conservation Plan (ML093380281).
October 15, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental response to Questions No. 1 and No. 5 of the U.S. Army Corps of Engineers request for additional information No. 1019 (Accession No. ML092920352).
October 19, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Revised Supplemental Response to request for additional information SE-2 (Accession No. ML092940343).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Douglas Austin, Pennsylvania Fish and Boat Commission, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660314).

October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Steven G. Bowman, Virginia Marine Resources Commission, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660325).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Robert W. Duncan, Virginia Department of Game and Inland Fisheries, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660318).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. John R. Griffin, Maryland Department of Natural Resources, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660202).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Ms. Patricia Kurkul, National Marine Fisheries Service, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660237).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Leopoldo Miranda, U.S. Fish & Wildlife Service, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660268).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Carl Roe, Pennsylvania Game Commission, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660259).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Paul Swartz, Susquehanna River Basin Commission, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660186).
October 26, 2009	Letter from Mr. Robert G. Schaaf, NRC, to Ms. Shari Wilson, Maryland Department of the Environment, requesting information on new alternative sites identified for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML092660193).

October 26, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC, transmitting updated responses to requests for additional information number 1006 and 1013 (Accession No. ML093020150).
October 29, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC responding to questions on Combined License Application Revision 5 changes (Accession No. ML093070286).
November 4, 2009	Email from Dr. Diana Post, Rachel Carson Council, to Ms. Laura Quinn, NRC, regarding opposition to the Calvert Cliffs Unit 3 Project (Accession No. ML093550177).
November 4, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting supplemental response to Request for Additional Information number 37, “Hydraulic Dredging” (Accession No. ML093130127).
November 13, 2009	Letter from Ms. Susan T. Gray, Maryland Department of Natural Resources, to Ms. Laura Quinn, NRC, transmitting the response to the request for information on the new alternative sites for the Calvert Cliffs review (Accession No. ML093280756).
November 16, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Supplemental Response to Request for Additional Information Number 124, Estimated Tax Benefit (Accession No. ML093220193).
November 16, 2009	Email from Mr. Dave Spotts, Pennsylvania Fish and Boat Commission, to Ms. Laura Quinn, NRC, responding to the information request on the revised alternative sites (Accession No. ML093290145).
November 20, 2009	Letter from Ms. Deborah E Jennings, DLA Piper on behalf of UniStar, to Ms. Terry J. Romine, Public Service Commission of Maryland transmitting Application of Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC for a Certificate of Public Convenience and Necessity Authorizing the Modification of the Calvert Cliffs Unit 3 Project at Calvert Cliffs in Calvert County, Maryland (Accession No. ML093380229).
December 3, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting Temporary Impacts to Wetlands and Streams Associated with Mitigation Construction Activities for Calvert Cliffs Unit 3 (Accession No. ML093370671).

December 4, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting responses to NRC telecom questions regarding Combined License Application Revision 6 (Accession No. ML093421232).
December 7, 2009	Email from Mr. Ernie Aschenbach, Virginia Dept. of Game and Inland Fisheries to Ms. Laura Quinn, NRC, regarding the Information Request on the New Alternative Sites (Accession No. ML093520692).
December 8, 2009	Letter from Mr. Greg Gibson, UniStar, to Ms. Amanda Sigillito, Maryland Department of the Environment and Ms. Kathy Anderson, U.S. Army Corps of Engineers transmitting the Conceptual Phase II Non-Tidal Wetland and Stream Mitigation Plan for Calvert Cliffs Unit 3 (Accession No. ML0935206940).
December 9, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Low level Waste Disposal Plans for Calvert Cliffs Unit 3 (Accession No. ML093480069).
December 10, 2009	Memo from Mr. John Nichols, National Oceanic and Atmospheric Administration, to Ms. Laura Quinn, NRC, transmitting Calvert Cliffs Nuclear Power Plant, Unit 3 Alternative Sites Analysis Information (Accession No. ML093520687).
December 11, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting RAI No. 1014 NOx and VOC Air Emissions during Construction and Operation (Accession No. ML093491087).
December 17, 2009	Letter from Mr. Greg Gibson, UniStar, to Kathy Anderson, U.S. Army Corps of Engineers, transmitting the Summary of the Conceptual Phase II Non-Tidal Wetland and Stream Mitigation Plan for Calvert Cliffs Unit 3 (Accession No. ML093620517).
December 23, 2009	Letter from Mr. Robert Schaaf, NRC, to Dr. Diana Post, Rachel Carson Council, Inc., regarding Comments on the Environmental Review for the Combined License Application for Calvert Cliffs (Accession No. ML093290154).
December 31, 2009	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Summary - Refinements between the Phase I Conceptual Phase II Nontidal Wetland and Stream Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML100050191)

January 28, 2010	Letter from Mr. Leopoldo Miranda, U.S. FWS, to Mr. Robert Schaaf, NRC, transmitting Information and Consultation request regarding the combined license application for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100430613).
February 23, 2010	Letter from Mr. Frank Akstulewicz, NRC, to Mr. George Vanderheyden, UniStar, transmitting Revised Environmental Schedule for the Combined License Application Review for the Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML100540412).
February 25, 2010	Letter from Mr. Leopoldo Miranda, U.S. FWS, to Mr. Robert Schaaf, NRC, regarding New Alternative Sites in Maryland for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100640429).
March 2, 2010	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC, transmitting the Trip Report to Calvert Cliffs for the Tiger Beetle and Phase I Mitigation Plan Activities (Accession No. ML100070711).
March 2, 2010	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC, transmitting Trip Report: Interviews with Public Officials regarding Socioeconomic and Environmental Justice Information for Calvert Cliffs Unit 3 (Accession No. ML100050174).
March 11, 2010	Letter from Mr. Greg Gibson, UniStar, to Ms. Laura Quinn, NRC, transmitting UniStar Nuclear Energy, NRC Docket No. 52-016 Calvert Cliffs Nuclear Power Plant, Unit 3 CZMA Certification (Accession No. ML100740273).
March 16, 2010	Memo from Ms. Laura Quinn, NRC, to Robert Schaaf, NRC, transmitting the Calvert Cliffs Site Audit Summary for the Revised Alternative Sites (Accession No. ML100040227).
March 16, 2010	Letter from Ms. Kathy Anderson, U.S. Army Corps of Engineers, to Mr. Reid Nelson, ACHP, transmitting the Memorandum of Agreement for Cultural and Historic Resources for the Proposed Unit 3 at Calvert Cliffs (Accession No. ML100810272).
March 18, 2010	Letter from Mr. Greg Gibson, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Phase II Non-Tidal Wetlands and Stream Concept Plan and Tidal Wetlands Impacts for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML101180069)

March 31, 2010	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Calvert Cliffs Nuclear Power Plant, Unit 3, NO_x Emissions Commitment Due Date Extension (Accession No. ML100950118).
April 7, 2010	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Revised NO_x and Volatile Organic Compound (VOC) Emissions and Air Conformity Report (Accession No. ML101020177).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. George Vanderheyden, UniStar, transmitting the Notice of Availability of the Draft Environmental Impact Statement Related to the Combined License for the Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100670539).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to U.S. EPA transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100670577).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Leopoldo Miranda, U.S. FWS, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100760590).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. John Griffin, Maryland Dept. of Natural Resources, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780101).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Ms. Shari Wilson, Maryland Dept. of the Environment, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780061).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Robert Duncan, Virginia Department of Game and Inland Fisheries, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780135).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Steven Bowman, Virginia Marine Resource Commission, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780160).

April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Carl Roe, Pennsylvania Game Commission, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780176).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Paul Swartz, Susquehanna River Basin Commission, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780187).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Ms. Patricia Kurkul, National Marine Fisheries Services, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780005).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. John Fowler, Advisory Council on Historic Preservation, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780518).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. J. Rodney Little, Maryland Historic Trust, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100780329).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to the Honorable Chief Natalie Proctor, Cedarville Band of Piscataway Indians, Inc, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100820479).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to Ms. Tonya Hardy, Commission on African History and Culture, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100980684).
April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to the Honorable Chief William “Red Wing” Tayac, The Piscataway Indians Nation, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100980650).

April 15, 2010	Letter from Mr. Robert Schaaf, NRC, to the Honorable Mervin Savoy, The Piscataway Conoy Confederacy and Subtribes, Inc., transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100980672).
April 15, 2010	Letter from Ms. Laura Quinn, NRC, to Ms. Pamela Perrygo, Calvert Library Prince Frederick, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100880530).
April 15, 2010	Letter from Ms. Laura Quinn, NRC, to Mr. Robert Gatton, Calvert Library Southern Branch, transmitting the Draft Environmental Impact Statement for a Combined License for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML100880513).
April 26, 2010	U.S. Army Corps of Engineers Public Notice for the Draft Environmental Impact Statement and Public Hearing for Calvert Cliffs Nuclear Power Plant (Accession No. ML101230085).
April 30, 2010	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting Calvert Cliffs Nuclear Power Plant Unit 3 NO_x Emissions Commitment Closure (Accession No. ML101230614).
April 30, 2010	Email from Mr. Ernie Aschenbach, Virginia Dept. of Game and Inland Fisheries, to NRC transmitting Comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML101241198).
May 3, 2010	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC, transmitting the Notice of Public Meeting to Discuss the Draft Environmental Impact Statement for the Calvert Cliffs Nuclear Power Plant Unit 3 Combined License (Accession No. ML101180471).
May 5, 2010	Email from Mr. Aaron Keel, EnviroProjects, LLC, to Ms. Laura Quinn, NRC, Requesting an Extension on the Calvert Cliffs Draft Environmental Impact Statement Comment Period (Accession No. ML101340168).
May 21, 2010	Letter from Mr. Scott Flanders, NRC, to Mr. Aaron Keel, EnviroProjects, LLC, transmitting the Response to the Request for Extension on the Calvert Cliffs Nuclear Power Plant Unit 3 Draft Environmental Impact Statement Comment Period (Accession No. ML101300249).

May 27, 2010	Letter from Mr. Greg Gibson, UniStar, to Ms. Kelly Neff, MDE, transmitting the Response to Comments Concerning Phase II Non-Tidal Wetlands and Stream Concept Plan and Tidal Wetlands Impacts for Calvert Cliffs Nuclear Power Plant, Unit3 (Accession No. ML101540569).
June 9, 2010	Email from Mr. Elder Ghigiarelli, Maryland Department of the Environment, to Ms. Laura Quinn, NRC, transmitting a Status of the Coastal Zone Management Federal Consistency Review (Accession No.ML101650411).
June 28, 2010	Memo from Ms. Laura M. Quinn, NRC, to Mr. Robert G. Schaaf, NRC, transmitting the Meeting Summary for the Calvert Cliffs Nuclear Power Plant Unit 3 Draft Environmental Impact Statement Public Meeting from May 25, 2010 (Accession No. ML101720321).
July 2, 2010	Letter from Ms. Susan Gray, Maryland Department of Natural Resources, to NRC Transmitting comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML101900427).
July 7, 2010	Letter from Ms. Ellie Irons, Virginia Department of Environmental Quality, to NRC transmitting Comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML101970046).
July 8, 2010	Letter from Mr. Michael T. Chezik, Department of the Interior, to Mr. Robert Schaaf, NRC, transmitting Comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102140110).
July 8, 2010	Email from Ms. Linda Vassallo on behalf of Calvert County Commissioners, to Ms. Laura Quinn, NRC, transmitting Clarification on the Board’s Position from the Draft Environmental Impact Statement Meeting on May 25, 2010 (Accession No. ML101950334).
July 9, 2010	Letter from Mr. Jeffrey Lapp, EPA, to Ms. Laura Quinn, NRC transmitting Comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML101940075).
July 31, 2010	Study submitted by Mr. Dimitri Lutchenkov, UniStar, to NRC on Baseline Stormwater Monitoring in Selected Stream Locations at Calvert Cliffs Nuclear Power Plant (Accession No. ML102210116)

August 17, 2010	Letter from Mr. Peter D. Colosi, Jr., NMFS, to Ms. Laura Quinn, NRC, transmitting Comments on the Essential Fish Habitat Assessment and the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102360364).
August 20, 2010	Letter from Mr. Peter D. Colosi, Jr., NMFS, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting Comments on the Essential Fish Habitat Assessment and the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102360363).
August 24, 2010	Letter from Mr. Jeffrey P. Madden, Virginia Marine Resources Commission, to Ms. Laura Quinn, NRC, regarding Consultation for Calvert Cliffs Nuclear Power Plant Unit 3 and Request for Fish Data (Accession No. ML102460712).
August 31, 2010	Letter from Mr. Greg Gibson, UniStar, to the Document Control Desk, NRC, transmitting the FY2012 Revision Schedule to the Combined License Applications for Calvert Cliffs Nuclear Power Plant Unit 3 and Nine Mile Point Nuclear Power Plant (Revised) (Accession No. ML102450484).
September 10, 2010	Letter from Mr. Elder A. Ghigiarelli, Jr., Maryland Department of the Environment, to Mr. Dimitri Lutchenkov, UniStar, Requesting a Stay on the Coastal Zone Management Determination for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102630586).
September 16, 2010	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC, Noticing the Forthcoming Public Meeting Regarding Clarification on the Emissions Estimates for the Proposed Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102571531).
September 17, 2010	Letter from Mr. Scott Flanders, NRC, to Mr. Peter Colosi, Jr., NMFS, transmitting the NRC's Response to Essential Fish Habitat Conservation Recommendations regarding the proposed Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102530102).
September 17, 2010	Letter from Mr. Greg Gibson, UniStar, to Mr. Elder A. Ghigiarelli, MDE, transmitting UniStar's Approval of a Coastal Zone Management Act Federal Consistency Timeclock Stay (Accession No. ML102650049).

September 29, 2010	Letter from Mr. Greg Gibson, UniStar, to NRC transmitting the Puritan Tiger Beetle Evaluation for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102770450).
October 7, 2010	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Joe Grist, Virginia Marine Resource Commission in Response to the Request for Raw Fish Entrainment Data for the Calvert Cliffs Nuclear Power Plant (Accession No. ML102640768).
October 8, 2010	Letter from Mr. Greg Gibson, UniStar, to Ms. Elizabeth Cole, MHT, Requesting for Cultural Resource Consultation due to Changes in the Project's Outfall Pipe Location and Dredging Location (Accession No. ML103010351).
October 14, 2010	Letter from Ms. Kathy Anderson, U.S. Army Corps of Engineers, to Mr. Dimitri Lutchenkov, UniStar, Regarding Responses and Rebuttal to Comments Received on the Public Notice for the Draft Environmental Impact Statement (Accession No. ML103020264).
October 18, 2010	Letter from Mr. Robert G. Schaaf, NRC, to the Calvert County Board of Commissioners in Response to the Request for the Removal of Public Comments on the Draft Environmental Impact Statement for the Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102640733).
October 18, 2010	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Brendan Sweeney, Calvert County Environmental Commission, in response to the Request for Removal of Public Comments on the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML10264708).
November 1, 2010	Letter from Mr. Greg Gibson, UniStar, to the Document Processing Center, NRC, transmitting an Advance Copy of Part 3 of the Combined License Application for the Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML103120045).
November 2, 2010	Letter from Mr. Greg Gibson, UniStar, to Ms. Amanda Sigillito, MDE, and Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Draft Final Phase II Nontidal Wetland and Stream Mitigation Plan for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML1030305709).

November 4, 2010	Email from Ms. Kathy Anderson, U.S. Army Corps of Engineers, to Mr. Dimitri Lutchenkov and Mr. Jim Burkman, Constellation, requesting Confirmation of Tiger Beetle Information for the Biological Assessment (Accession No. ML103260518).
November 5, 2010	Email from Mr. Woody Francis, U.S. Army Corps of Engineers to Mr. Jim Burkman, Constellation, Requesting Reply to EPA Comment, NMFS, Ms. Sevilla and Air Conformity Issues (Accession No. ML103260519).
November 10, 2010	Letter from Ms. Laura Quinn, NRC, to Mr. Greg Gibson, UniStar, transmitting Request for Additional Information Related to the Environmental Review for the Calvert Cliffs Combined License Application – Ozone Air Emission Mitigation and Offset for the Air Conformity Analysis (Accession No. ML102880649).
November 11, 2010	Letter from Mr. Greg Gibson, UniStar, to Mr. Jonathan Stewart, Maryland Department of the Environment and Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Updated Work Description for Tidal Impacts and Dredge Area Sediment Sampling Test Results for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML103360087).
November 11, 2010	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Kathy Anderson and Woody Francis, U.S. Army Corps of Engineers, transmitting Tidal Wetlands Whitepaper (Accession No. ML103260528).
November 12, 2010	Letter from Mr. Greg Gibson, UniStar, to Ms. Maryann Parkhurst, PNNL, transmitting the Revised MACCS2 Input/Output Files (Accession No. ML103340133).
November 16, 2010	Memo from Ms. Laura Quinn, NRC, to Mr. Robert Schaaf, NRC, transmitting the Meeting Summary of the October 1, 2010, Public Meeting Related to the Air Conformity Analysis for the Combined License Application Review for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML102940568).
November 18, 2010	Email from Mr. Woody Francis, U.S. Army Corps of Engineers, to Mr. Dimitri Lutchenkov, UniStar, Requesting Additional Information related to the Corps' Air Conformity Analysis (Accession No. ML103260590).
November 19, 2010	Environmental Report Advanced Copy for Calvert Cliffs Nuclear Power Plant Unit 3 – Red Line Version (Accession No. ML103370143).

November 19, 2010	Letter from Mr. Greg Gibson, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Responses to Selected Comments on the Calvert Cliffs Nuclear Power Plant Draft Environmental Impact Statement (Accession No. ML103350685)
November 24, 2010	Letter from Mr. Robert Schaaf, NRC, to Mr. Greg Gibson, UniStar, transmitting the Status of the Environmental review for Calvert Cliffs Nuclear Power Plant Unit 3 Combined License Application Review (Accession No. ML102861867).
November 29, 2010	Letter from Mr. Troy J. Nowak, Maryland Historical Trust, to Mr. Woody Francis, U.S. Army Corps of Engineers, regarding the Request for Cultural Consultation for Calvert Cliffs Unit 3, Nuclear Power Plant Site (Accession No. ML103420270).
December 3, 2010	Letter from Mr. Robert Schaaf, NRC, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting the NRC's Air Conformity Determination Procedures Summary (Accession No. ML103130308).
December 3, 2010	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Laura Quinn, NRC, transmitting the Input and Output Files for GASPAR II (Accession No. ML110030063).
December 6, 2010	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Laura Quinn, NRC, transmitting the Input and Output Files for LADTAPII (Accession No. ML110030037).
December 9, 2010	Letter from Mr. Greg Gibson, UniStar, to the Document Control Desk, NRC, transmitting the Updated UniStar Energy Ownership Information for Calvert Cliffs Nuclear Power Plant Unit 3 Combined License Application, Part 3, Environmental Report (Accession No. ML103490445).
December 20, 2010	Letter from Mr. Greg Gibson, UniStar, to the Document Control Desk, NRC, transmitting Calvert Cliffs Combined License Application Revision 7 (Accession No. ML103620346).
December 20, 2010	Letter from Mr. Greg Gibson, UniStar, to the Document Control Desk, NRC, transmitting RAI Ozone Air Emission Mitigation and Offset for Air Conformity Analysis Response Schedule Extension (Accession No. ML103570078).

January 3, 2011	Email from Mr. Woody Francis, U.S. Army Corps of Engineers, to Mr. Dimitri Lutchenkov, UniStar, Resending the Request for Additional Information Related to the Corps' Air Conformity Analysis (ML110130262).
January 3, 2011	Email from Mr. Dimitri Lutchenkov to Ms. Kathy Anderson and Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the National Marine Fisheries Service Concurrence on Tidal Mitigation Strategy (Accession No. ML110130216).
January 3, 2011	Email from Mr. Dimitri Lutchenkov, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Response for Additional Information Related to the Corps' Air Conformity Analysis (Accession No. ML110130257).
January 6, 2011	Letter from Mr. Robert G. Schaaf, NRC, to Mr. Leopoldo Miranda, U.S. Fish and Wildlife Service, transmitting the Biological Assessment Related to the Review for the Combined License Application for Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML103440079).
January 7, 2011	Email from Mr. Woody Francis, U.S. Army Corps of Engineers, to Mr. Dimitri Lutchenkov, UniStar, and Ms. Laura Quinn, NRC, transmitting the Status of the Corps Review for Issuance of the Final Environmental Impact Statement (Accession No. ML110120188).
January 20, 2011	Letter from Mr. David Matthews, NRC, to Mr. George Vanderheyden, UniStar, regarding the Status of the Environmental Review for Calvert Cliffs Nuclear Power Plant, Unit 3 Combined License Application (Accession No. ML103640002).
January 25, 2011	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Kathy Anderson, U.S. Army Corps of Engineers, transmitting Calvert Cliffs Unit 3 FEIS - Suggested Text for Air Conformity (Accession No. ML1105600850).
January 27, 2011	Letter from Mr. Greg Gibson, UniStar, to the Document Control Desk, NRC, regarding the Calvert Cliffs Nuclear Power Plant, Unit 3 Environmental Review Schedule (Accession No. ML110330167).
January 28, 2011	Email from Mr. Woody Francis, U.S. Army Corps of Engineers, to Mr. Jim Burkman, Constellation Energy, transmitting Nontidal Wetlands and Stream Mitigation Summary Tables for Confirmation (Accession No. ML110460197).

January 31, 2011	Letter from Mr. Jonathan Sager, Maryland Historical Trust, to Mr. Woody Francis, U.S. Army Corps of Engineers, Concurring on the Camp Conoy and the Baltimore & Drum Point Railroad Field Archival Recordation.
February 4, 2011	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers providing Non-tidal Wetlands and Stream Mitigation Summary Tables (Accession No. ML110450168).
February 14. 2011	Letter from Mr. Greg Gibson, UniStar, to Document Control Desk, NRC, transmitting the Response to Request for Additional Information #1016 – Ozone Air Emission Mitigation and Offset for the Air Conformity Analysis for Calvert Cliffs Unit 3 (Accession No. ML110490065).
February 14, 2011	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Laura Quinn, NRC, transmitting Clarification to Enclosure 3 of UN#11-069 – Material for MDE Public Notice/Response (Accession No. ML1105600431).
February 23, 2011	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting Revised Nontidal and Stream Mitigation Summary Tables (Accession No. ML110600944).
February 23, 2011	Letter from Mr. Leopoldo Miranda, U.S. FWS, to Mr. Robert Schaaf, NRC, transmitting the Concurrence Letter for the Biological Assessment for the Combined License Application for Calvert Cliffs Nuclear Power Plant Unit 3 (Accession No. ML110680437).
March 9, 2011	Email from Mr. Dimitri Lutchenkov, UniStar, to Ms. Laura Quinn, NRC, transmitting Clarification of the Armoring and the Fish Return for Calvert Cliffs Nuclear Power Plant Unit 3 resulting from the Maryland Dept. of the Environment's Public Notice (Accession No. ML110690937).
March 10, 2011	Letter from Ms. Dixie Henry, Maryland Historical Trust, to Ms. Laura Quinn, NRC, transmitting Concurrence of the Section 106 Findings in the Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 Combined License (Accession No. ML110750313).
March 15, 2011	Email from Ms. Harriet Nash, NRC, to Mr. John Nichols and Ms. Julie Crocker, NMFS, regarding Revisions to Calvert Cliffs Unit 3 Project for Consultation (ML110800149).
March 15, 2011	Email from Mr. John Nichol, NMFS, to Ms. Harriet Nash, NRC, regarding Revisions to Calvert Cliffs Unit 3 Project for Consultation (ML110800237).

March 28, 2011	Email from Ms. Brenda Nuse, Constellation, to Ms. Laura Quinn, NRC, on Calvert Cliffs Uits 1 and 2 Horseshoe Crab Impingement (ML110871373).
April 15, 2011	Letter from Ms. Patricia A. Kurkul, NMFS, to Mr. Robert Schaaf, NRC, regarding Calvert Cliffs – Unit 3 Project and Biological Assessment (Accession No. ML111080809).
April 15, 2011	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Work Plan for Tidal Mitigation Planning for Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML111220349).
April 18, 2011	Letter from Mr. Dimitri Lutchenkov, UniStar, to Mr. Woody Francis, U.S. Army Corps of Engineers, transmitting the Final Phase II Nontidal Wetland and Stream Mitigation Plan for Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML111190230.
April 26, 2011	Letter from Mr. David Matthew, NRC, to Mr. George Vanderheyden, UniStar, Issuance of a Revised Environmental Schedule for the Combined License Application Review for the Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML110980377).
April 27, 2011	The U.S. Army Corps of Engineers Final Work Description for Calvert Cliffs Nuclear Power Plant, Unit 3 (Accession No. ML111170449).
April 27, 2011	Letter from Ms. Kathy B. Anderson, U.S. Army Corps of Engineers, to NRC, transmitting Concurrence on the Final Environmental Impact Statement (Accession No. ML111180152).

Appendix D

Scoping Comments and Responses

Appendix D

Scoping Comments and Responses

On February 14, 2008, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process in the *Federal Register* (73 FR 8719) (ML080390115). The Notice of Intent notified the public of the staff's intent to prepare an environmental impact statement (EIS) and conduct scoping for the combined license (COL) application received from UniStar Nuclear Development, LLC (UniStar) for a new nuclear plant, identified as Calvert Cliffs Unit 3, to be located at the existing Calvert Cliffs site, located approximately 60 mi south of Baltimore. This EIS has been prepared in accordance with provisions of the National Environmental Policy Act of 1969, as amended (NEPA); Council on Environmental Quality guidelines; and Title 10 of the Code of Federal Regulations (CFR) Parts 51 and 52. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the *Federal Register* Notice. The NRC invited the applicant; Federal, Tribal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at two scheduled public meetings and/or by submitting written suggestions and comments no later than April 14, 2008.

The scoping process provides an opportunity for public participation to identify items to be addressed in the EIS and highlight public concerns and issues. The Notice of Intent identified the following objectives of the scoping process:

- Define the proposed action that is to be the subject of the EIS.
- Determine the scope of the EIS and identify significant issues to be analyzed in depth.
- Identify and eliminate from detailed study those issues that are peripheral or that are not significant.
- Identify any environmental assessments and other EISs that are being prepared or will be prepared that are related to, but not part of, the scope of the EIS being considered.
- Identify other environmental review and consultation requirements related to the proposed action.
- Identify parties consulting with the NRC under the NHPA, as set forth in 36 CFR 800.8(c)(1)(i).
- Indicate the relationship between the timing of the preparation of the environmental analyses and the Commission's tentative planning and decision-making schedule.

- Identify any cooperating agencies and, as appropriate, allocate assignments for preparation and schedules for completing the EIS to the NRC and any cooperating agencies.
- Describe how the EIS will be prepared, and identify any contractor assistance to be used.

Two public scoping meetings were held in Solomons, Maryland, on March 19, 2008. Approximately 250 people attended the afternoon session, and approximately 225 people attended the evening session. Each meeting began with NRC staff members providing a brief overview of NRC's review process for COL applications and the NEPA process. After the NRC's prepared statements, the meetings were opened for public comments. Twenty-seven (27) afternoon scoping meeting attendees and 21 evening scoping meeting attendees provided oral comments that were recorded and transcribed by a certified court reporter. Five written statements were received during the meetings. In addition to the oral and written statements provided at the public scoping meetings, six letters and 201 emails were received during the scoping period.

Transcripts for both the afternoon and evening scoping meetings can be found in the NRC's Agency Document Access and Management System (ADAMS), under accession numbers ML081160460 and ML081160468, respectively. ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams/web-based.html (in the Public Electronic Reading Room; note that the URL is case-sensitive). A meeting summary (ML091690293) was issued May 8, 2008.

At the conclusion of the scoping period, the NRC staff reviewed the scoping meeting transcripts and all written material received during the comment period and identified individual comments. These comments were organized according to topic within the proposed EIS or according to the general topic if outside the scope of the EIS. Once comments were grouped according to subject area, the staff determined the appropriate response for the comment. The staff made a determination on each comment that it was one of the following:

- a comment that was actually a question and introduced no new information.
- a comment that was either related to support or opposition of combined licensing in general (or specifically the Calvert Cliffs COL) or that made a general statement about the COL process. In addition, it provided no new information and did not pertain to 10 CFR Part 52.
- a comment about an environmental issue that
  - provided new information that would require evaluation during the review
  - provided no new information.
- a comment that was outside the scope of the COL, which included, but was not limited to, a comment on the safety of the existing units.

After comments were grouped according to subject area, the staff prepared responses to the comments, identifying which were within the scope of the EIS. The *Calvert Cliffs Unit 3 Combined License Scoping Summary Report* was released in October 2008 and is available in ADAMS at accession number ML082630585.

Each comment applicable (in scope) to this environmental review is summarized in this appendix. This information, which was extracted from the *Calvert Cliffs Unit 3 Combined License Scoping Summary Report*, is provided for convenience of those interested in the scoping comments. The comments that are outside of the scope of the environmental review for the proposed Unit 3 site are not included here. These include comments related to

- Safety
- Emergency preparedness
- NRC oversight for operating plants
- Security and terrorism
- Support or opposition to the licensing action, licensing process, nuclear power, hearing process, or the existing plant.

Changes to a few of the responses have made since the publication of the Scoping Summary Report (e.g., revisions to the EIS outline) and are indicated within brackets. Most of these refer to changes or the addition of EIS chapter or section numbers for the reader's convenience.

Table D-1 identifies, in alphabetical order, the individuals providing comments during the scoping period; their affiliation, if given; and the ADAMS accession number that can be used to locate the correspondence. Although all commenters are listed to maintain consistency with the scoping summary report numbering system, the comments presented in this appendix are limited to those within the scope of the environmental review. Table D-2 lists the comment categories in alphabetical order and commenter names and comment numbers for each category. The balance of this appendix presents the comments themselves with NRC staff responses organized by topic category.

Table D-1. Individuals Providing Comments During the Comment Period

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Acevedo, NK	Self	Email (ML081510581)
Aitken, Keith	Self	Email (ML081510623)
Albright, Evan	Self	Email (ML081510692)
Andereson, David	Self	Email (ML081510716)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Arist, Phyllis	Self	Email (ML081510632)
Armas, Zoe	Self	Email (ML081510729)
Arndt, Gunter	Self	Email (ML081510518)
Avance, Kenneth	Self	Email (ML081510635)
Bainum, Meghan	Self	Email (ML081510728)
Bakalian, Craig	Self	Email (ML081510684)
Baldwin, Natylie	Self	Email (ML081510549)
Barr, Phillip	Self	Email (ML081510560)
Bartholomew, Alice	Self	Email (ML081510640)
Baummer, Thomas	Self	Email (ML081510546)
Be, Maya	Self	Email (ML081510776)
Becker, Rochelle	Self	Email (ML081510698)
Bedding, Gerhard	Self	Email (ML081510586)
Behabadi, Bardia	Self	Email (ML081510659)
Benton, Mike	Self	Meeting Transcript (ML081160460)
Bissonnette, Rick	Self	Email (ML081510714)
Black, Monica Latka	Self	Email (ML081510585)
Blomstrom, Eric	Self	Email (ML081510525)
Borrowman, Ellen	Self	Email (ML081510711)
Boswell, William	Self	Email (ML081510521)
Boxwell, Bob	Self	Meeting Transcript (ML081160460)
Briggs, Ruth	Self	Email (ML081510673)
Brown, Jr., Edsel	NAACP of Calvert County	Email (ML081510736)
Buchanan, Bill	Self	Meeting Transcript (ML081160468)
Burton, Bob	Anne Arundel County Chamber of Commerce	Meeting Transcript

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
		(ML081160460)
C, Suzy [per email]	Self	Email (ML081510568)
Chambers, Bill	Self	Meeting Transcript (ML081160468)
Chinn, Jason	Self	Email (ML081510688)
Clark, Gerald	Board Of County Commissioners, Calvert County	Letter (ML081160363)
Clark, Kevin	Self	Email (ML081510783)
Clark, Loralee	Self	Email (ML081510703)
Cleaver, Melissa	Self	Email (ML081510602)
Coster, Steven	Self	Email (ML081510519)
Cox, Duncan	Self	Email (ML081510667)
Crawley, Jackie	Self	Email (ML081510791)
Crocca, Carol	Self	Email (ML081510641)
Culp, Richard	Self	Email (ML081510672)
Curington, Diana	Self	Email (ML081510725)
Daddy, Big [per email]	Self	Email (ML081510784)
Darbyshire, David	Self	Email (ML081510792)
DesHarnais, Gaston	Self	Email (ML081510651)
Diaz, Lorenzo	Self	Email (ML081510638)
Dolly, William	Self	Email (ML081510637)
Donn, Marjory	Self	Letter (ML0808404265)
Dubois, Gwen	Physicians for Social Responsibility	Meeting Transcript (ML081160468)
Dufay, Frank	Self	Email (ML081510627)
Emmons, Cheryl	Self	Email (ML081510697)
Erdesohn, Cynthia	Self	Email (ML081510721)
Evans, Michael	Self	Email (ML081510628)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Faigle, Susan	Self	Email (ML081510609)
Fernow, Geoff	Self	Email (ML081510679)
Finnelli, Marilyn and Tom	Self	Email (ML081510685)
Fisher, Allison	Self	Email (ML081510544)
Foppe, Paul	Self	Email (ML081510686)
Fuller, Alfred	Self	Email (ML081510539)
Futterer, Joe	Self	Email (ML081510524)
Gaffney-Smith, Margaret	Department of the Army	Letter (ML0811302781)
Gannaway, Gloria	Self	Email (ML081510526)
Garbato, Kelly	Self	Email (ML081510622)
Garner, Patrick	Self	Email (ML081510678)
Garrett, Nick	Calvert County Tourism Advisory Commission	Meeting Transcript (ML081160468)
Gilpin, John	Self	Email (ML081510709)
Good, Riana	Self	Email (ML081510528)
Goodrich, Anne	Self	Email (ML081510536)
Grad, Robert	Self	Email (ML081510582)
Grand, Robert	Self	Email (ML081510608)
Grassi, Rosemarie	Self	Email (ML081510796)
Gray, Susan	Maryland Department of Natural Resources	Letter (ML0811302840)
Green, Bonnie	Patuxent Partnership	Meeting Transcript (ML081160460)
Guay-Brezner, Colette	Self	Email (ML081510580)
Gunter, Paul	Nuclear Information and Research Service	Meeting Transcript (ML081160468)
Harberson, Laurie	Self	Email (ML081510639)
Hauck, Molly	Self	Email (ML081510587)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Hedlund, Cara	Self	Email (ML081510732)
Helvick, Steven	Self	Email (ML081510726)
Henderson, Sherry	Self	Email (ML081510777)
Hinton, Georgia	Self	Email (ML081510574)
Hodge, Gary	Tri-County Council for Southern Maryland	Letter (ML081130650)
Hoffman, Lilli	Self	Email (ML081510569)
Holzer, Frederick	Self	Email (ML081510664)
Hood, Marilyn	Self	Email (ML081510605)
Hooker, Betsy	Self	Email (ML081510778)
Huffman, Debbie	Self	Email (ML081510643)
Hughey, Patricia	Self	Email (ML081510648)
Hung, Shiu	Self	Email (ML081510541)
Hunter, Theresa	Self	Meeting Transcript (ML081160460)
Hutchinson, Richard	Self	Email (ML081510720)
Ireland, John	Self	Email (ML081510694)
Johnston, Bill		Meeting Transcript (ML081160460)
Jones, Hollis	Self	Email (ML081510572)
Jones-Giampalo, Mary	Self	Email (ML081510702)
Joos, Sandra	Self	Email (ML081510530)
Jula, Patty	Self	Email (ML081510547)
Kaliski, Raymond	Self	Email (ML081510590)
Kamps, Kevin	Beyond Nuclear	Meeting Transcript (ML081160468)
Kanaley, Mike	Clean and Safe Energy Coalition	Meeting Transcript (ML081160468)
Kane, Donna	Self	Email (ML081510588)
Karbowsky, Brad	United Association of Plumbers, Steamfitters,	Meeting Transcript

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
	and Sprinkler fitters	(ML081160468)
Katz, Shari	Self	Email (ML081510607)
Kelley, Linda	Calvert County Board of Commissioners	Letter (ML081160363)
Kjer, Timothy	Self	Email (ML081510520)
Klusman, Eric	Self	Email (ML081510534)
Knechel, David	Self	Email (ML081510550)
Kramer, Loren	Self	Email (ML081510657)
Kuintzle, Gaylene	Self	Email (ML081510738)
Lack, Robert	Self	Email (ML081510537)
Lallo, Patrick	Self	Email (ML081510680)
LaLumia, Anne Marie	Self	Email (ML081510567)
LaMonica, Francoise	Self	Email (ML081510592)
Latham, Rhonda	Self	Email (ML081510789)
LaVigne, Carole	Self	Email (ML081510625)
Lee, Angela	Self	Email (ML081510674)
Loew, Brenda	Self	Email (ML081510774)
Luczkowiak, Christopher	Self	Email (ML081510645)
M, Crystal [per email]	Self	Email (ML081510781)
Mackall, Kimberly	The Concerned Black Women of Calvert County, Inc.	Email (ML081510770)
MacNulty, Joy	Self	Email (ML081510675)
Magee, L	Self	Email (ML081510730)
Manske, Jill	Self	Email (ML081510646)
Marcus, Jack David	Self	Email (ML081510797)
Mariotte, Michael	Nuclear Information and Resource Service for Chesapeake Safe Energy Coalition	Meeting Transcript (ML081160460)
Mariotte, Michael	Nuclear Information and Resource Service for Chesapeake Safe Energy Coalition	Email (ML081510772)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Marks, John	Self	Email (ML081510689)
Marsh, Rauni	Self	Email (ML081510603)
Martins, Darren	Calvert County Chamber of Commerce	Meeting Transcript (ML081160460)
Massey, Tom	Self	Email (ML081510671)
McAndrew-Benevides, Elizabeth	North American Young Generation in Nuclear	Meeting Transcript (ML081160468)
McArthur, Richard	Self	Email (ML081510676)
McClure, Matthew	Self	Email (ML081510647)
McCoy, Timothy	Self	Email (ML081510734)
McGarvey, Sean	Building and Construction Trades Department, AFL-CIO	Meeting Transcript (ML081160460)
McGough, Mike	Self	Meeting Transcript (ML081160460)
McKenna, Chris	Self	Email (ML081510611)
McKenna, Kathy	Self	Email (ML081510619)
McKenna, Lauren	Self	Email (ML081510614)
McKenna, Rick	Self	Email (ML081510615)
Meadow, Karen	Maryland Conservation Council	Meeting Transcript (ML081160460)
Meadow, Norman	Maryland Conservation Council	Email (ML081510706)
Metz, Richard	Self	Email (ML081510629)
Minault, Kent	Self	Email (ML081510690)
Miranda, Tina	Self	Email (ML081510687)
Moore, Kerry	Self	Email (ML081510773)
Mostov, Liz	Self	Email (ML081510696)
Munson, Clarence William	Self	Email (ML081510565)
Nagle, Thomas	Self	Email (ML081510691)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Nanfra, Freya	Self	Email (ML081510794)
Nash, James	Self	Email (ML081510583)
Nerode, Gregory	Self	Email (ML081510786)
Neumann, Johanna	Maryland Public Interest Group	Meeting Transcript (ML081160468)
Novick, Wesley	Self	Email (ML081510624)
Nunez, Albert	Self	Email (ML081510571)
Nunez, Carlos	Self	Email (ML081510559)
Oakes, Bonnie	Self	Email (ML081510561)
O'Donnell, Anthony	The Maryland House of Delegates	Letter (ML081160364)
Olmstead, Harry	Self	Email (ML081510707)
O'Meara, Patrick	Self	Email (ML081510682)
Pacheco-Theard, Lauren	Self	Email (ML081510700)
Paquet, Kevin	Self	Email (ML081510633)
Parran, Wilson	Calvert County Board of Commissioners	Meeting Transcript (ML081160468)
Parsons, Barry	Self	Email (ML081510718)
Paul, Georgia	Self	Email (ML081510782)
Pedraza-Tucker, Liette	Self	Email (ML081510535)
Petkiewicz, Margaret	Self	Email (ML081510553)
Phipps, Donald	Self	Email (ML081510548)
Piner, Lisa	Self	Email (ML081510542)
Piser, Daniel	Self	Email (ML081510538)
Polya, Lance	Self	Email (ML081510681)
Pope, Nate	Calvert County Economic Development Commission	Meeting Transcript (ML081160468)
Pretto-Simmons, Nancy	Self	Meeting Transcript (ML081160460)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Putney, Louis	Self	Email (ML081510564)
Rader, Nancy	Self	Email (ML081510555)
Radford Jr., Roger	Self	Email (ML081510556)
Raines, Mary	Self	Email (ML081510636)
Ramstrom, Eric G and Shirley S	Self	Email (ML081510658)
Randall, David	Self	Email (ML081510665)
Rankin, Susan	Self	Email (ML081510670)
Reidenbach, Gregory	Self	Email (ML081510790)
Rosenblum, Stephen	Self	Email (ML081510699)
Ross, Anne	Self	Email (ML081510788)
Rudy, Mike	Self	Email (ML081510522)
Russell, Jack	St. Mary's County Commissioners	Meeting Transcript (ML081160460)
Sather, Alice	Self	Email (ML081510708)
Sauer, Elizabeth	Self	Email (ML081510563)
Scarafia, Bill	St. Mary's County Chamber of Commerce	Meeting Transcript (ML081160460)
Schlager, Robert	Calvert Memorial Hospital	Meeting Transcript (ML081160468)
Schmidt, Jason	Self	Email (ML081510531)
Schopp, Ricky	Self	Email (ML081510787)
Schwarz, Walter	Self	Email (ML081510626)
See, Bud	Self	Email (ML081510660)
Shafer, Scott	Self	Email (ML081510606)
Shannahan, Brittany	Self	Email (ML081510545)
Shashani, Linda	Self	Email (ML081510662)
Shaw, Susan	Board of County Commissioners, Calvert County	Letter (ML081160363)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
Sherrow, Sarah	Self	Email (ML081510655)
Shively, Daniel	Self	Email (ML081510731)
Siecke, Martin	Self	Email (ML081510557)
Simila, Owen	Self	Email (ML081510653)
Sinclair, Jim	Self	Meeting Transcript (ML081160460)
Skercevic, Maria	Self	Email (ML081510558)
Smith, Enoch	Self	Email (ML081510552)
Smith, Martha	Self	Email (ML081510656)
Snowden, Patricia	Self	Email (ML081510570)
Sorin, Susanna	Self	Email (ML081510597)
Soroos, Marvin S	Self	Email (ML081510663)
Soto, Yvonne	Self	Email (ML081510733)
Stevens, Denise	Self	Email (ML081510723)
Stilwell, Lisa	Self	Email (ML081510722)
Stinnett, Barbara	Board of County Commissioners, Calvert County	Letter (ML081160363)
Strange, Linda	Self	Email (ML081510540)
Tarhan, Diane	Solomons Business Association	Meeting Transcript (ML081160460)
Theil, Tony	Self	Email (ML081510620)
Thiele, Abhaya	Self	Email (ML081510576)
Tornatore, James	Self	Email (ML081510683)
Trenholme, Art	Self	Email (ML081510669)
Tucker, Dawn	Calvert County Minority Business Alliance	Email (ML081510768)
Turner, Tamisha	Self	Email (ML081510589)
Valliere, Cliff	Self	Email (ML081510737)
Vanderheyden, George	Unistar Nuclear Energy	Meeting Transcript (ML081160468)

Table D-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #
VanEtten, Margot	Self	Email (ML081510701)
Vieg, Jeannette	Self	Email (ML081510573)
Voeller, Estelle	Self	Email (ML081510577)
Vogt, Peter	Self	Email (ML081510516)
Wadkins, Melanie	Self	Email (ML081510551)
Waldman, Sam	Self	Email (ML081510529)
Walker-Meere, Susan	Self	Email (ML081510724)
Walsh, Donald	Self	Email (ML081510533)
Walters, Betty	Self	Email (ML081510719)
Walther, Robert	Clean and Safe Energy Coalition	Meeting Transcript (ML081160460)
Wanner, Gabrielle	Self	Email (ML081510523)
Ward, John	Self	Email (ML081510727)
Welch, Irene	Self	Email (ML081510775)
Wilkins, Paul	Self	Email (ML081510584)
Willoughby, CaraLea	Self	Email (ML081510566)
Wilson, Deb	Self	Email (ML081510710)
Yeatts, Jordan	Self	Email (ML081510780)
Zahniser, Albert	Self	Letter (ML081160362)
Zastawecky, Margaret	Self	Email (ML081510769)
Zelikson, Linda	Self	Email (ML081510644)

Table D-2. Comment Categories

Comment Category	Commenter (Comment ID)
Accidents	• Acevedo, NK (0008-3) • Aitken, Keith (0008-3) • Albright, Evan (0008-3) • Andereson, David (0008-3) • Arist, Phyllis (0008-3) • Armas, Zoe (0008-3) • Avance, Kenneth (0008-3) • Bainum, Meghan (0008-3) • Bakalian, Craig (0008-3) • Baldwin, Natylie (0008-3) • Barr, Phillip (0008-3) • Bartholomew, Alice (0008-3) • Be, Maya (0008-3) • Becker, Rochelle (0008-3) • Bedding, Gerhard (0008-3) • Behabadi, Bardia (0008-3) • Bissonnette, Rick (0008-3) • Black, Monica Latka (0008-3) • Blomstrom, Eric (0008-3) • Borrowman, Ellen (0008-3) • Briggs, Ruth (0008-3) • C, Suzy (0008-3) • Chinn, Jason (0008-3) • Clark, Kevin (0008-3) • Clark, Loralee (0008-3) • Cleaver, Melissa (0008-3) • Cox, Duncan (0008-3) • Crawley, Jackie (0008-3) • Crocca, Carol (0008-3) • Culp, Richard (0008-3) • Curington, Diana (0008-3) • Daddy, Big (0008-3) • Darbyshire, David (0008-3) • DesHarnais, Gaston (0008-3) • Diaz, Lorenzo (0008-3) • Dolly, William (0008-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Emmons, Cheryl (0008-3) • Erdesohn, Cynthia (0008-3) • Evans, Michael (0008-3) • Faigle, Susan (0008-3) • Fernow, Geoff (0008-3) • Finnelli, Marilyn and Tom (0008-3) • Fisher, Allison (0008-3) • Foppe, Paul (0008-3) • Fuller, Alfred (0008-3) • Futterer, Joe (0008-3) • Gannaway, Gloria (0008-3) • Garbato, Kelly (0008-3) • Garner, Patrick (0008-3) • Gilpin, John (0008-3) • Good, Riana (0008-3) • Goodrich, Anne (0008-3) • Grad, Robert (0008-3) • Grand, Robert (0008-3) • Grassi, Rosemarie (0008-3) • Guay-Brezner, Colette (0008-3) • Harberson, Laurie (0008-3) • Hauck, Molly (0008-3) • Hedlund, Cara (0008-3) • Helvick, Steven (0008-3) • Henderson, Sherry (0008-3) • Hinton, Georgia (0008-3) • Hoffman, Lilli (0008-3) • Holzer, Frederick (0008-3) • Hood, Marilyn (0008-3) • Hooker, Betsy (0008-3) • Huffman, Debbie (0008-3) • Hughey, Patricia (0008-3) • Hung, Shiu (0008-3) • Hutchinson, Richard (0008-3) • Jones, Hollis (0008-3) • Jones-Giampalo, Mary (0008-3) • Joos, Sandra (0008-3) • Jula, Patty (0008-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Kaliski, Raymond (0008-3) • Kamps, Kevin (0024-76) (0024-77) (0024-79) (0024-84) • Kane, Donna (0008-3) • Katz, Shari (0008-3) • Klusman, Eric (0008-3) • Knechel, David (0008-3) • Kramer, Loren (0008-3) • Kuintzle, Gaylene (0008-3) • Lack, Robert (0008-3) • Lallo, Patrick (0008-3) • LaLumia, Anne Marie (0008-3) • LaMonica, Francoise (0008-3) • Latham, Rhonda (0008-3) • LaVigne, Carole (0008-3) • Lee, Angela (0008-3) • Loew, Brenda (0008-3) • Luczkowiak, Christopher (0008-3) • M, Crystal (0008-3) • Mackall, Kimberly (0018-1) (0018-9) • MacNulty, Joy (0008-3) • Magee, L (0008-3) • Manske, Jill (0008-3) • Marcus, Jack David (0008-3) • Mariotte, Michael (0019-7) (0019-8) • Mariotte, Michael (0019-18) (0019-19) (0019-23) (0025-43) • Marks, John (0008-3) • Marsh, Rauni (0008-3) (0026-3) • Massey, Tom (0008-3) • McArthur, Richard (0008-3) • McClure, Matthew (0008-3) • McCoy, Timothy (0008-3) • McKenna, Chris (0008-3) • McKenna, Kathy (0008-3) • McKenna, Lauren (0008-3) • McKenna, Rick (0008-3) • Metz, Richard (0008-3) • Minault, Kent (0008-3) • Miranda, Tina (0008-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Moore, Kerry (0008-3) • Mostov, Liz (0008-3) • Munson, Clarence William (0008-3) • Nagle, Thomas (0008-3) • Nanfra, Freya (0008-3) • Nash, James (0008-3) • Nerode, Gregory (0008-3) • Novick, Wesley (0008-3) • Nunez, Albert (0008-3) • Nunez, Carlos (0008-3) • Oakes, Bonnie (0008-3) • Olmstead, Harry (0008-3) • O'Meara, Patrick (0008-3) • Pacheco-Theard, Lauren (0008-3) • Paquet, Kevin (0008-3) • Parsons, Barry (0008-3) • Paul, Georgia (0008-3) • Pedraza-Tucker, Liette (0008-3) • Petkiewicz, Margaret (0008-3) • Phipps, Donald (0008-3) • Piner, Lisa (0008-3) • Piser, Daniel (0008-3) • Putney, Louis (0008-3) • Rader, Nancy (0008-3) • Radford Jr., Roger (0008-3) • Raines, Mary (0008-3) • Ramstrom, Eric G and Shirley S (0008-3) • Randall, David (0008-3) • Rankin, Susan (0008-3) • Reidenbach, Gregory (0008-3) • Rosenblum, Stephen (0008-3) • Ross, Anne (0008-3) • Sather, Alice (0008-3) • Sauer, Elizabeth (0008-3) • Schmidt, Jason (0008-3) • Schopp, Ricky (0008-3) • Schwarz, Walter (0008-3) • See, Bud (0008-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Shafer, Scott (0008-3) • Shashani, Linda (0008-3) • Sherrow, Sarah (0008-3) • Shively, Daniel (0008-3) • Siecke, Martin (0008-3) • Simila, Owen (0008-3) • Skercevic, Maria (0008-3) • Smith, Enoch (0008-3) • Smith, Martha (0008-3) • Snowden, Patricia (0008-3) • Sorin, Susanna (0008-3) • Soroos, Marvin S (0008-3) • Soto, Yvonne (0008-3) • Stevens, Denise (0008-3) • Stilwell, Lisa (0008-3) • Strange, Linda (0008-3) • Theil, Tony (0008-3) • Thiele, Abhaya (0008-3) • Tornatore, James (0008-3) • Trenholme, Art (0008-3) • Turner, Tamisha (0008-3) • Valliere, Cliff (0008-3) • VanEtten, Margot (0008-3) • Vieg, Jeannette (0008-3) • Voeller, Estelle (0008-3) • Wadkins, Melanie (0008-3) • Waldman, Sam (0008-3) • Walker-Meere, Susan (0008-3) • Walsh, Donald (0008-3) • Walters, Betty (0008-3) • Wanner, Gabrielle (0008-3) • Ward, John (0008-3) • Welch, Irene (0008-3) • Wilkins, Paul (0008-3) • Willoughby, CaraLea (0008-3) • Wilson, Deb (0008-3) • Yeatts, Jordan (0008-3) • Zastawecky, Margaret (0008-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Zelikson, Linda (0008-3)
Alternatives-Energy	• Donn, Marjory (0020-1) (0020-8) • Dubois, Gwen (0024-60) • Hunter, Theresa (0025-160) (0025-161) • Johnston, Bill (0025-109) (0025-110) (0025-113) • Kamps, Kevin (0024-80) (0024-81) (0024-82) • Kanaley, Mike (0024-22) • Mariotte, Michael (0019-4) • Marsh, Rauni (0026-2) (0026-5) • McGarvey, Sean (0025-145) • Meadow, Karen (0025-65) (0025-67) (0025-68) (0025-69) (0025-70) (0025-71) (0025-72) (0025-73) • Meadow, Norman (0028-1) (0028-4) (0028-6) (0028-7) (0028-9) (0028-10) (0028-11) (0028-12) (0028-13) (0028-14) (0028-15) (0028-16) (0028-17) (0028-18) (0028-19) (0028-20) (0028-21) (0028-34) • Neumann, Johanna (0024-34) (0024-36) • Parran, Wilson (0024-9) (0024-10) (0025-11) (0025-12) • Shannahan, Brittany (0007-5) • Sinclair, Jim (0025-140) (0025-141) • Vogt, Peter (0005-19) (0005-23) (0005-25) (0005-26) (0005-27) (0005-29) • Walther, Robert (0025-120)
Alternatives-No-Action	• Mariotte, Michael (0019-5) (0025-47) • McGarvey, Sean (0025-146) (0025-147)
Benefit-Cost Balance	• Donn, Marjory (0020-3) • Fisher, Allison (0025-91) • Kamps, Kevin (0024-78) (0024-89) (0024-90) • Mariotte, Michael (0019-1) (0019-2) (0019-3) (0025-48) (0025-49) • Meadow, Karen (0025-66) • Meadow, Norman (0028-26) (0028-27) • Neumann, Johanna (0024-37) • Vanderheyden, George (0024-116) • Vogt, Peter (0005-28)
Cumulative Impacts	• Buchanan, Bill (0024-109)
Ecology-Terrestrial	• Meadow, Norm (0025-59) (0028-2)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Vogt, Peter (0005-13)
Environmental Justice	• Mackall, Kimberly (0018-2) (0018-3)
Geology	• Mariotte, Michael (0019-35)
Health-Radiological	• Dubois, Gwen (0024-68) • Mackall, Kimberly (0018-10) • Mariotte, Michael (0019-17) (0019-22) (0025-53) • Meadow, Norm (0025-57) (0025-58) (0028-5) (0028-28) (0028-29) (0028-30) (0028-31) (0028-32) (0028-33) • Shannahan, Brittany (0007-3)
Historic and Cultural Resources	• Fisher, Allison (0025-94)
Hydrology-Surface Water	• Baummer, Thomas (0006-4) (0006-7) • Buchanan, Bill (0024-110) (0024-110) • Fisher, Allison (0025-93)
Land Use-Site and vicinity	• Baummer, Thomas (0006-8)
Land Use-Transmission lines	• Clark, Gerald (0014-2) • Kelley, Linda (0014-2) • Parran, Wilson (0014-2) (0024-4) (0025-5) • Shaw, Susan (0014-2) • Stinnett, Barbara (0014-2) • Vogt, Peter (0005-14) (0005-15) (0005-16) (0005-17)
Meteorology and Air Quality	• Baummer, Thomas (0006-5) (0006-6) • Mariotte, Michael (0019-29) (0019-30) (0019-31) (0025-45) (0025-46)
Need for Power	• Arndt, Gunter (0004-3) • Burton, Bob (0025-32) • Clark, Gerald (0014-3) • Green, Bonnie (0025-128) • Green, Joseph (0025-86) • Hodge, Gary (0023-3) • Hunter, Theresa (0025-162) • Kanaley, Mike (0024-21) • Kelley, Linda (0014-3)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Meadow, Karen (0025-74) (0025-75) (0028-8) • Meadow, Norman (0028-22) (0028-23) (0028-24) • O'Donnell, Anthony (0015-2) • Parran, Wilson (0014-3) (0024-8) (0025-7) (0025-10) • Pretto-Simmons, Nancy (0025-166) • Russell, Jack (0025-22) • Scarafia, Bill (0025-83) • Shaw, Susan (0014-3) • Sinclair, Jim (0025-139) • Stinnett, Barbara (0014-3) • Vogt, Peter (0005-20) (0005-21) (0005-22) • Walther, Robert (0025-118) (0025-119) • Zahniser, Albert (0016-3)
Process-ESP-COL	• Baummer, Thomas (0006-2) (0006-3) • Brown, Jr., Edsel (0017-1) • Coster, Steven (0003-1) • Fisher, Allison (0025-88) (0025-89) (0025-90) • Gaffney-Smith, Margaret (0021-1) (0021-2) • Gray, Susan (0022-1) • Hodge, Gary (0024-15) (0025-107) • Kamps, Kevin (0024-88) • Kjer, Timothy (0003-1) • Mackall, Kimberly (0018-14) • Mariotte, Michael (0019-20) (0025-41) • Martins, Darren (0025-26) (0024-3) (0024-13) (0025-3) (0025-17) • Shannahan, Brittany (0003-1)
Site Layout and Design	• Parran, Wilson (0024-2) (0025-2) • Scarafia, Bill (0024-96) • Sinclair, Jim (0025-133) • Vanderheyden, George (0024-113) (0024-115) (0024-118) (0024-119) (0025-168) (0025-169) (0025-171) (0025-172) (0025-173)
Socioeconomics	• Boswell, William (0002-2) • Brown, Jr., Edsel (0017-7) (0017-9) • Burton, Bob (0025-35) (0025-36) (0025-37) (0025-38) • Chambers, Bill (0024-42) (0024-43) (0024-44) • Kanaley, Mike (0024-26) • Karbowsky, Brad (0024-107) (0025-78) (0025-80)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• McClure, Deborah (0024-29) • O'Donnell, Anthony (0015-5) • Parran, Wilson L. (0024-56) • Scarafia, Bill (0024-93) (0024-94) (0025-82) • Sinclair, Jim (0025-137) (0025-138) • Tarhan, Diane (0025-175) (0005-4) (0005-6) (0005-8) (0005-9) • Vogt, Peter (0005-10) (0005-11) (0005-12) • Walther, Robert (0025-123)
Transportation	• Acevedo, NK (0008-5) • Aitken, Keith (0008-5) • Albright, Evan (0008-5) • Andereson, David (0008-5) • Arist, Phyllis (0008-5) • Armas, Zoe (0008-5) • Avance, Kenneth (0008-5) • Bainum, Meghan (0008-5) • Bakalian, Craig (0008-5) • Baldwin, Natylie (0008-5) • Barr, Phillip (0008-5) • Bartholomew, Alice (0008-5) • Be, Maya (0008-5) • Becker, Rochelle (0008-5) • Bedding, Gerhard (0008-5) • Behabadi, Bardia (0008-5) • Bissonnette, Rick (0008-5) • Black, Monica Latka (0008-5) • Blomstrom, Eric (0008-5) • Borrowman, Ellen (0008-5) • Briggs, Ruth (0008-5) • Brown, Jr., Edsel (0017-2) • C, Suzy (0008-5) • Chinn, Jason (0008-5) • Clark, Kevin (0008-5) • Clark, Loralee (0008-5) • Cleaver, Melissa (0008-5) • Cox, Duncan (0008-5) • Crawley, Jackie (0008-5)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Crocca, Carol (0008-5) • Culp, Richard (0008-5) • Curington, Diana (0008-5) • Daddy, Big (0008-5) • Darbyshire, David (0008-5) • DesHarnais, Gaston (0008-5) • Diaz, Lorenzo (0008-5) • Dolly, William (0008-5) • Donn, Marjory (0020-6) • Emmons, Cheryl (0008-5) • Erdesohn, Cynthia (0008-5) • Evans, Michael (0008-5) • Faigle, Susan (0008-5) • Fernow, Geoff (0008-5) • Finnelli, Marilyn and Tom (0008-5) • Fisher, Allison (0008-5) • Foppe, Paul (0008-5) • Fuller, Alfred (0008-5) • Futterer, Joe (0008-5) • Gannaway, Gloria (0008-5) • Garbato, Kelly (0008-5) • Garner, Patrick (0008-5) • Gilpin, John (0008-5) • Good, Riana (0008-5) • Goodrich, Anne (0008-5) • Grad, Robert (0008-5) • Grand, Robert (0008-5) • Grassi, Rosemarie (0008-5) • Guay-Brezner, Colette (0008-5) • Harberson, Laurie (0008-5) • Hauck, Molly (0008-5) • Hedlund, Cara (0008-5) • Helvick, Steven (0008-5) • Henderson, Sherry (0008-5) • Hinton, Georgia (0008-5) • Hoffman, Lilli (0008-5) • Holzer, Frederick (0008-5) • Hood, Marilyn (0008-5)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Hooker, Betsy (0008-5) • Huffman, Debbie (0008-5) • Hughey, Patricia (0008-5) • Hung, Shiu (0008-5) • Hutchinson, Richard (0008-5) • Jones, Hollis (0008-5) • Jones-Giampalo, Mary (0008-5) • Joos, Sandra (0008-5) • Jula, Patty (0008-5) • Kaliski, Raymond (0008-5) • Kamps, Kevin (0025-100) (0025-101) (0025-102) • Kane, Donna (0008-5) • Katz, Shari (0008-5) • Klusman, Eric (0008-5) • Knechel, David (0008-5) • Kramer, Loren (0008-5) • Kuintzle, Gaylene (0008-5) • Lack, Robert (0008-5) • Lallo, Patrick (0008-5) • LaLumia, Anne Marie (0008-5) • LaMonica, Francoise (0008-5) • Latham, Rhonda (0008-5) • LaVigne, Carole (0008-5) • Lee, Angela (0008-5) • Loew, Brenda (0008-5) • Luczkowiak, Christopher (0008-5) • M, Crystal (0008-5) • MacNulty, Joy (0008-5) • Magee, L (0008-5) • Manske, Jill (0008-5) • Marcus, Jack David (0008-5) • Mariotte, Michael (0019-10) (0019-12) • Marks, John (0008-5) • Marsh, Rauni (0008-5) • Massey, Tom (0008-5) • McArthur, Richard (0008-5) • McClure, Matthew (0008-5) • McCoy, Timothy (0008-5)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• McKenna, Chris (0008-5) • McKenna, Kathy (0008-5) • McKenna, Lauren (0008-5) • McKenna, Rick (0008-5) • Meadow, Norm (0025-63) • Meadow, Norman (0028-37) (0028-38) • Metz, Richard (0008-5) • Minault, Kent (0008-5) • Miranda, Tina (0008-5) • Moore, Kerry (0008-5) • Mostov, Liz (0008-5) • Munson, Clarence William (0008-5) • Nagle, Thomas (0008-5) • Nanfra, Freya (0008-5) • Nash, James (0008-5) • Nerode, Gregory (0008-5) • Novick, Wesley (0008-5) • Nunez, Albert (0008-5) • Nunez, Carlos (0008-5) • Oakes, Bonnie (0008-5) • Olmstead, Harry (0008-5) • O'Meara, Patrick (0008-5) • Pacheco-Theard, Lauren (0008-5) • Paquet, Kevin (0008-5) • Parsons, Barry (0008-5) • Paul, Georgia (0008-5) • Pedraza-Tucker, Liette (0008-5) • Petkiewicz, Margaret (0008-5) • Phipps, Donald (0008-5) • Piner, Lisa (0008-5) • Piser, Daniel (0008-5) • Putney, Louis (0008-5) • Rader, Nancy (0008-5) • Radford Jr., Roger (0008-5) • Raines, Mary (0008-5) • Ramstrom, Eric G and Shirley S (0008-5) • Randall, David (0008-5) • Rankin, Susan (0008-5)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Reidenbach, Gregory (0008-5) • Rosenblum, Stephen (0008-5) • Ross, Anne (0008-5) • Sather, Alice (0008-5) • Sauer, Elizabeth (0008-5) • Schmidt, Jason (0008-5) • Schopp, Ricky (0008-5) • Schwarz, Walter (0008-5) • See, Bud (0008-5) • Shafer, Scott (0008-5) • Shashani, Linda (0008-5) • Sherrow, Sarah (0008-5) • Shively, Daniel (0008-5) • Siecke, Martin (0008-5) • Simila, Owen (0008-5) • Skercevic, Maria (0008-5) • Smith, Enoch (0008-5) • Smith, Martha (0008-5) • Snowden, Patricia (0008-5) • Sorin, Susanna (0008-5) • Soroos, Marvin S (0008-5) • Soto, Yvonne (0008-5) • Stevens, Denise (0008-5) • Stilwell, Lisa (0008-5) • Strange, Linda (0008-5) • Theil, Tony (0008-5) • Thiele, Abhaya (0008-5) • Tornatore, James (0008-5) • Trenholme, Art (0008-5) • Turner, Tamisha (0008-5) • Valliere, Cliff (0008-5) • VanEtten, Margot (0008-5) • Vieg, Jeannette (0008-5) • Voeller, Estelle (0008-5) • Wadkins, Melanie (0008-5) • Waldman, Sam (0008-5) • Walker-Meere, Susan (0008-5) • Walsh, Donald (0008-5)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Walters, Betty (0008-5) • Wanner, Gabrielle (0008-5) • Ward, John (0008-5) • Welch, Irene (0008-5) • Wilkins, Paul (0008-5) • Willoughby, CaraLea (0008-5) • Wilson, Deb (0008-5) • Yeatts, Jordan (0008-5) • Zastawecky, Margaret (0008-5) • Zelikson, Linda (0008-5)
Uranium Fuel Cycle	• Acevedo, NK (0008-1) (0008-2) (0008-4) (0008-6) • Aitken, Keith (0008-1) (0008-2) (0008-4) (0008-6) • Albright, Evan (0008-1) (0008-2) (0008-4) (0008-6) • Andereson, David (0008-1) (0008-2) (0008-4) (0008-6) • Arist, Phyllis (0008-1) (0008-2) (0008-4) (0008-6) • Armas, Zoe (0008-1) (0008-2) (0008-4) (0008-6) • Arndt, Gunter (0004-5) • Avance, Kenneth (0008-1) (0008-2) (0008-4) (0008-6) • Bainum, Meghan (0008-1) (0008-2) (0008-4) (0008-6) • Bakalian, Craig (0008-1) (0008-2) (0008-4) (0008-6) • Baldwin, Natylie (0008-1) (0008-2) (0008-4) (0008-6) • Barr, Phillip (0008-1) (0008-2) (0008-4) (0008-6) • Bartholomew, Alice (0008-1) (0008-2) (0008-4) (0008-6) • Be, Maya (0008-1) (0008-2) (0008-4) (0008-6) • Becker, Rochelle (0008-1) (0008-2) (0008-4) (0008-6) • Bedding, Gerhard (0008-1) (0008-2) (0008-4) (0008-6) • Behabadi, Bardia (0008-1) (0008-2) (0008-4) (0008-6) • Bissonnette, Rick (0008-1) (0008-2) (0008-4) (0008-6) • Black, Monica Latka (0008-1) (0008-2) (0008-4) (0008-6) • Blomstrom, Eric (0008-1) (0008-2) (0008-4) (0008-6) • Borrowman, Ellen (0008-1) (0008-2) (0008-4) (0008-6) • Boxwell, Bob (0025-159) • Briggs, Ruth (0008-1) (0008-2) (0008-4) (0008-6) • C, Suzy (0008-1) (0008-2) (0008-4) (0008-6) • Chinn, Jason (0008-1) (0008-2) (0008-4) (0008-6) • Clark, Kevin (0008-1) (0008-2) (0008-4) (0008-6) • Clark, Loralee (0008-1) (0008-2) (0008-4) (0008-6)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Cleaver, Melissa (0008-1) (0008-2) (0008-4) (0008-6) • Cox, Duncan (0008-1) (0008-2) (0008-4) (0008-6) • Crawley, Jackie (0008-1) (0008-2) (0008-4) (0008-6) • Crocca, Carol (0008-1) (0008-2) (0008-4) (0008-6) • Culp, Richard (0008-1) (0008-2) (0008-4) (0008-6) • Curington, Diana (0008-1) (0008-2) (0008-4) (0008-6) • Daddy, Big (0008-1) (0008-2) (0008-4) (0008-6) • Darbyshire, David (0008-1) (0008-2) (0008-4) (0008-6) • DesHarnais, Gaston (0008-1) (0008-2) (0008-4) (0008-6) • Diaz, Lorenzo (0008-1) (0008-2) (0008-4) (0008-6) • Dolly, William (0008-1) (0008-2) (0008-4) (0008-6) • Donn, Marjory (0020-2) (0020-5) • Emmons, Cheryl (0008-1) (0008-2) (0008-4) (0008-6) • Erdesohn, Cynthia (0008-1) (0008-2) (0008-4) (0008-6) • Evans, Michael (0008-1) (0008-2) (0008-4) (0008-6) • Faigle, Susan (0008-1) (0008-2) (0008-4) (0008-6) • Fernow, Geoff (0008-1) (0008-2) (0008-4) (0008-6) • Finnelli, Marilyn and Tom (0008-1) (0008-2) (0008-4) (0008-6) • Fisher, Allison (0008-1) (0008-2) (0008-4) (0008-6) • Foppe, Paul (0008-1) (0008-2) (0008-4) (0008-6) • Fuller, Alfred (0008-1) (0008-2) (0008-4) (0008-6) • Futterer, Joe (0008-1) (0008-2) (0008-4) (0008-6) • Gannaway, Gloria (0008-1) (0008-2) (0008-4) (0008-6) • Garbato, Kelly (0008-1) (0008-2) (0008-4) (0008-6) • Garner, Patrick (0008-1) (0008-2) (0008-4) (0008-6) • Gilpin, John (0008-1) (0008-2) (0008-4) (0008-6) • Good, Riana (0008-1) (0008-2) (0008-4) (0008-6) • Goodrich, Anne (0008-1) (0008-2) (0008-4) (0008-6) • Grad, Robert (0008-1) (0008-2) (0008-4) (0008-6) • Grand, Robert (0008-1) (0008-2) (0008-4) (0008-6) • Grassi, Rosemarie (0008-1) (0008-2) (0008-4) (0008-6) • Guay-Brezner, Colette (0008-1) (0008-2) (0008-4) (0008-6) • Harberson, Laurie (0008-1) (0008-2) (0008-4) (0008-6) • Hauck, Molly (0008-1) (0008-2) (0008-4) (0008-6) • Hedlund, Cara (0008-1) (0008-2) (0008-4) (0008-6) • Helvick, Steven (0008-1) (0008-2) (0008-4) (0008-6) • Henderson, Sherry (0008-1) (0008-2) (0008-4) (0008-6) • Hinton, Georgia (0008-1) (0008-2) (0008-4) (0008-6)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Hoffman, Lilli (0008-1) (0008-2) (0008-4) (0008-6) • Holzer, Frederick (0008-1) (0008-2) (0008-4) (0008-6) • Hood, Marilyn (0008-1) (0008-2) (0008-4) (0008-6) • Hooker, Betsy (0008-1) (0008-2) (0008-4) (0008-6) • Huffman, Debbie (0008-1) (0008-2) (0008-4) (0008-6) • Hughey, Patricia (0008-1) (0008-2) (0008-4) (0008-6) • Hung, Shiu (0008-1) (0008-2) (0008-4) (0008-6) • Hutchinson, Richard (0008-1) (0008-2) (0008-4) (0008-6) • Ireland, John (0012-1) • Johnston, Bill (0025-111) • Jones, Hollis (0008-1) (0008-2) 0008-4) (0008-6) • Jones-Giampalo, Mary (0008-1) (0008-2) (0008-4) (0008-6) • Joos, Sandra (0008-1) (0008-2) (0008-4) (0008-6) • Jula, Patty (0008-1) (0008-2) (0008-4) (0008-6) • Kaliski, Raymond (0008-1) (0008-2) (0008-4) (0008-6) • Kamps, Kevin (0024-85) (0024-86) (0025-95) (0025-96) (0025-98) • Kane, Donna (0008-1) (0008-2) (0008-4) (0008-6) • Katz, Shari (0008-1) (0008-2) (0008-4) (0008-6) • Klusman, Eric (0008-1) Eric (0008-2) (0008-4) (0008-6) • Knechel, David (0008-1) (0008-2) (0008-4) (0008-6) • Kramer, Loren (0008-1) (0008-2) (0008-4) (0008-6) • Kuintzle, Gaylene (0008-1) (0008-2) (0008-4) (0008-6) • Lack, Robert (0008-1) (0008-2) (0008-4) (0008-6) • Lallo, Patrick (0008-1) (0008-2) (0008-4) (0008-6) • LaLumia, Anne Marie (0008-1) (0008-2) (0008-4) (0008-6) • LaMonica, Francoise (0008-1) (0008-2) (0008-4) (0008-6) • Latham, Rhonda (0008-1) (0008-2) (0008-4) (0008-6) • LaVigne, Carole (0008-1) (0008-2) (0008-4) (0008-6) • Lee, Angela (0008-1) (0008-2) (0008-4) (0008-6) • Loew, Brenda (0008-1) (0008-2) (0008-4) (0008-6) • Luczkowiak, Christopher (0008-1) (0008-2) (0008-4) (0008-6) • M, Crystal (0008-1) (0008-2) (0008-4) (0008-6) • Mackall, Kimberly (0018-4) • MacNulty, Joy (0008-1) (0008-2) (0008-4) (0008-6) • Magee, L (0008-1) (0008-2) (0008-4) (0008-6) • Manske, Jill (0008-1) (0008-2) (0008-4) (0008-6) • Marcus, Jack David (0008-1) (0008-2) (0008-4) (0008-6) (0019-6) • Mariotte, Michael (0019-9) (0019-13) (0019-14) (0019-15) (0019-16)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	(0025-50) (0025-51) (0025-52) • Marks, John (0008-1) (0008-2) (0008-4) (0008-6) • Marsh, Rauni (0008-1) (0008-2) (0008-4) (0008-6) (0026-1) (0026-4) • Massey, Tom (0008-1) (0008-2) (0008-4) (0008-6) • McArthur, Richard (0008-1) (0008-2) (0008-4) (0008-6) • McClure, Matthew (0008-1) (0008-2) (0008-4) (0008-6) • McCoy, Timothy (0008-1) (0008-2) (0008-4) (0008-6) • McGough, Mike (0024-103) • McKenna, Chris (0008-1) (0008-2) (0008-4) (0008-6) • McKenna, Kathy (0008-1) (0008-2) (0008-4) (0008-6) • McKenna, Lauren (0008-1) (0008-2) (0008-4) (0008-6) • McKenna, Rick (0008-1) (0008-2) (0008-4) (0008-6) • Meadow, Norm (0025-61) (0025-62) • Meadow, Norman (0028-35) (0028-36) • Metz, Richard (0008-1) (0008-2) (0008-4) (0008-6) • Minault, Kent (0008-1) (0008-2) (0008-4) (0008-6) • Miranda, Tina (0008-1) (0008-2) (0008-4) (0008-6) • Moore, Kerry (0008-1) (0008-2) (0008-4) (0008-6) • Mostov, Liz (0008-1) (0008-2) (0008-4) (0008-6) • Munson, Clarence William (0008-1) (0008-2) (0008-4) (0008-6) • Nagle, Thomas (0008-1) (0008-2) (0008-4) (0008-6) • Nanfra, Freya (0008-1) (0008-2) (0008-4) (0008-6) • Nash, James (0008-1) (0008-2) (0008-4) (0008-6) • Nerode, Gregory (0008-1) (0008-2) (0008-4) (0008-6) • Novick, Wesley (0008-1) (0008-2) (0008-4) (0008-6) • Nunez, Albert (0008-1) (0008-2) (0008-4) (0008-6) • Nunez, Carlos (0008-1) (0008-2) (0008-4) (0008-6) • Oakes, Bonnie (0008-1) (0008-2) (0008-4) (0008-6) • Olmstead, Harry (0008-1) (0008-2) (0008-4) (0008-6) • O'Meara, Patrick (0008-1) (0008-2) (0008-4) (0008-6) • Pacheco-Theard, Lauren (0008-1) (0008-2) (0008-4) (0008-6) • Paquet, Kevin (0008-1) (0008-2) (0008-4) (0008-6) • Parsons, Barry (0008-1) (0008-2) (0008-4) (0008-6) • Paul, Georgia (0008-1) (0008-2) (0008-4) (0008-6) • Pedraza-Tucker, Liette (0008-1) (0008-2) (0008-4) (0008-6) • Petkiewicz, Margaret (0008-1) (0008-2) (0008-4) (0008-6) • Phipps, Donald (0008-1) (0008-2) (0008-4) (0008-6) • Piner, Lisa (0008-1) (0008-2) (0008-4) (0008-6)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Piser, Daniel (0008-1) (0008-2) (0008-4) (0008-6) • Polya, Lance (0010-1) • Putney, Louis (0008-1) (0008-2) (0008-4) (0008-6) • Rader, Nancy (0008-1) (0008-2) (0008-4) (0008-6) • Radford Jr., Roger (0008-1) (0008-2) (0008-4) (0008-6) • Raines, Mary (0008-1) (0008-2) (0008-4) (0008-6) • Ramstrom, Eric G and Shirley S (0008-1) (0008-2) (0008-4) (0008-6) • Randall, David (0008-1) (0008-2) (0008-4) (0008-6) • Rankin, Susan (0008-1) (0008-2) (0008-4) (0008-6) • Reidenbach, Gregory (0008-1) (0008-2) (0008-4) (0008-6) • Rosenblum, Stephen (0008-1) (0008-2) (0008-4) (0008-6) • Ross, Anne (0008-1) (0008-2) (0008-4) (0008-6) • Sather, Alice (0008-1) (0008-2) (0008-4) (0008-6) • Sauer, Elizabeth (0008-1) (0008-2) (0008-4) (0008-6) • Schmidt, Jason (0008-1) (0008-2) (0008-4) (0008-6) • Schopp, Ricky (0008-1) (0008-2) (0008-4) (0008-6) • Schwarz, Walter (0008-1) (0008-2) (0008-4) (0008-6) • See, Bud (0008-1) (0008-2) (0008-4) (0008-6) • Shafer, Scott (0008-1) (0008-2) (0008-4) (0008-6) • Shannahan, Brittany (0007-2) • Shashani, Linda (0008-1) (0008-2) (0008-4) (0008-6) • Sherrow, Sarah (0008-1) (0008-2) (0008-4) (0008-6) • Shively, Daniel (0008-1) (0008-2) (0008-4) (0008-6) • Siecke, Martin (0008-1) (0008-2) (0008-4) (0008-6) • Simila, Owen (0008-1) (0008-2) (0008-4) (0008-6) • Skercevic, Maria (0008-1) (0008-2) (0008-4) (0008-6) • Smith, Enoch (0008-1) (0008-2) (0008-4) (0008-6) • Smith, Martha (0008-1) (0008-2) (0008-4) (0008-6) • Snowden, Patricia (0008-1) (0008-2) (0008-4) (0008-6) • Sorin, Susanna (0008-1) (0008-2) (0008-4) (0008-6) • Soroos, Marvin S (0008-1) (0008-2) (0008-4) (0008-6) • Soto, Yvonne (0008-1) (0008-2) (0008-4) (0008-6) • Stevens, Denise (0008-1) (0008-2) (0008-4) (0008-6) • Stilwell, Lisa (0008-1) (0008-2) (0008-4) (0008-6) • Strange, Linda (0008-1) (0008-2) (0008-4) (0008-6) • Theil, Tony (0008-1) (0008-2) (0008-4) (0008-6) • Thiele, Abhaya (0008-1) (0008-2) (0008-4) (0008-6) (0009-1) • Tornatore, James (0008-1) (0008-2)

Table D-2. (contd)

Comment Category	Commenter (Comment ID)
	• Tornatore, James (0008-4) • Tornatore, James (0008-6) • Trenholme, Art (0008-1) (0008-2) (0008-4) (0008-6) (0011-1) • Turner, Tamisha (0008-1) (0008-2) (0008-4) (0008-6) • Valliere, Cliff (0008-1) (0008-2) (0008-4) (0008-6) • VanEtten, Margot (0008-1) (0008-2) (0008-4) (0008-6) • Vieg, Jeannette (0008-1) (0008-2) (0008-4) (0008-6) • Voeller, Estelle (0008-1) (0008-2) (0008-4) (0008-6) • Wadkins, Melanie (0008-1) (0008-2) (0008-4) (0008-6) • Waldman, Sam (0008-1) (0008-2) (0008-4) (0008-6) • Walker-Meere, Susan (0008-1) (0008-2) (0008-4) (0008-6) • Walsh, Donald (0008-1) (0008-2) (0008-4) (0008-6) • Walters, Betty (0008-1) (0008-2) (0008-4) (0008-6) • Wanner, Gabrielle (0008-1) (0008-2) (0008-4) (0008-6) • Ward, John (0008-1) (0008-2) (0008-4) (0008-6) • Welch, Irene (0008-1) (0008-2) (0008-4) (0008-6) • Wilkins, Paul (0008-1) (0008-2) (0008-4) (0008-6) • Willoughby, CaraLea (0008-1) (0008-2) (0008-4) (0008-6) • Wilson, Deb (0008-1) (0008-2) (0008-4) (0008-6) • Yeatts, Jordan (0008-1) (0008-2) (0008-4) (0008-6) • Zastawecky, Margaret (0008-1) (0008-2) (0008-4) (0008-6) • Zelikson, Linda (0008-1) (0008-2) (0008-4) (0008-6)

D.1 In-Scope Comments and Responses

The in-scope comments are listed by their categories and associated page numbers in Table D-3 in the order that they are presented in this EIS. Parenthetical numbers after each comment refer to the Comment Identification (ID) number (document number-comment number) and the commenter name.

Table D-3. Comment Categories

1. Comments Concerning the COL Process

Comment: The proposed project is located in the Chesapeake Bay and unnamed tributaries to the Chesapeake Bay, forested nontidal wetlands, Johns Creek and Goldstein Branch and their unnamed tributaries at UniStar's Calvert Cliffs site near Lusby, Calvert County, Maryland. The Corps is responsible for making decisions pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. It is our understanding that the NRC final rule governing Limited Work Authorizations (LWA) for Nuclear Power Plants (10 CFR Parts 2, 50, 51, 52, and 100) allows certain construction activities on production and utilization facilities to commence before a construction permit or combined license is issued. We believe that because our authority to regulate work in jurisdictional waters of the U.S., including wetlands, is a smaller component of the overall project, that the NRC has greater Federal control, responsibility and expertise for evaluating the effects of this proposed action on the environment, and therefore it is appropriate that the NRC be the lead agency for compliance with the National Environmental Policy Act (NEPA) for the proposed action. It would be inappropriate for the Corps to segment the limited infrastructure components associated with, the overall Calvert Cliffs Nuclear Power Plant Unit 3 expansion where the NRC possesses the expertise in determining the environmental consequences associated with the proposed construction of the AREVA EPR and has the ultimate approval/disapproval authority for the proposal. However, given our responsibility for regulating work which is proposed for the LWA and/or license, we request to serve as a cooperating agency in the preparation of the EIS for the Calvert Cliffs Nuclear Power Plant Unit-3 project. (**0021-1** [Gaffney-Smith, Margaret])

Comment: The Corps has the responsibility and authority to regulate portions of the proposal that affect waters of the U.S., including jurisdictional wetlands, and has the expertise necessary to assist the NRC with meeting its statutory requirements. Therefore, in accordance with the CEQ regulations we [the Corps of Engineers] are requesting to be designated as a cooperating agency for the EIS for this project. (**0021-2** [Gaffney-Smith, Margaret])

Response: *The NRC received official notice of the U.S. Army Corps of Engineers' interest in becoming a cooperating agency for the Calvert Cliffs COL EIS. The NRC has agreed by letter dated June 11, 2008 (ML081570139), to invite the U.S. Army Corps of Engineers to serve as a cooperating agency in the preparation of the EIS for this licensing action.*

Comment: The environmental impact statement scoping process should factor in long-term and short term impacts of the proposed new reactor at Calvert Cliffs. I urge NRC to include researching alternatives to a new reactor, a comprehensive cost-benefit analysis, a study of high and low level radioactive waste, safety and emergency planning into its scoping process. (**0003-1** [Coster, Steven] [Kjer, Timothy] [Shannahan, Brittany])

Response: *The NRC staff will prepare an Environmental Impact Statement (EIS) in accordance with its regulatory requirements. In its review, the staff will focus on the environmental effects of construction and operation of the proposed reactor and associated facilities and equipment. Alternative energy sources, a benefit-cost analysis, onsite treatment and handling of radiological waste, and short-term and long-term impacts are within the scope of this licensing action and will be addressed in the EIS. Safety and emergency planning are not within the scope of the EIS but are addressed in separate NRC reviews.*

Comment: I understand that the new NRC rules do not consider certain site-preparation activities as construction and therefore allow these activities to occur before the final Environmental Impact Study is issued. Nonetheless, I urge you to consider the impact of these activities in the EIS so that changes can be made to the work in progress if necessary. (**0006-3** [Baummer, Thomas])

Comment: The NRC under a recently promulgated change to its regulations has redefined what the word "construction" means and effectively 90 percent of the construction of this new reactor, NRC no longer considers falling under the National Environmental Policy Act. They can do a lot of construction at the Calvert Cliffs 3 site without doing an environmental assessment of the environmental impacts, and I just ask how does that comport with protecting the coastline of the Chesapeake? (**0024-88** [Kamps, Kevin])

Comment: [A]bout a year ago the nuclear industry was able to successfully convince the NRC to redefine, as Jim said, the word "construction." Redefining this word effectively circumvents the 1971 court decision. So while they are not technically violating this law, they are certainly violating the spirit of NEPA, the National Environmental Protection [Policy] Act that mandates that they prepare an EIS. (**0025-88** [Fisher, Allison])

Comment: I'd like you to consider the following for your EIS – to assure that these [LWA construction] activities are being conducted in an environmentally responsible manner, and to restore the NRC's compliance responsibilities, not to mention to restore the appearance of being overseers rather than promoters of nuclear power. (**0025-89** [Fisher, Allison])

Comment: You should consider all construction activities in the EIS, especially the before-mentioned, and withhold permission from Constellation, who is intending to take advantage of this new construction rule, until you have issued your final EIS. (**0025-90** [Fisher, Allison])

Response: *These comments refer to the NRC's change in the definition of "construction" based on its regulatory authority. As authorized by the Atomic Energy Act of 1954, as amended, NRC is charged with protecting the public health and safety with regard to the civilian use of nuclear material. As defined in 10 CFR 51.4, construction now refers to building safety-related structures, systems, or components (SSCs) necessary for power plant construction. Construction also includes SSCs required to provide physical protection and onsite emergency planning. Activities such as clearing and grading; excavating; building transmission lines; and erecting support buildings that are not required for nuclear safety, physical protection, or emergency planning are now considered "preconstruction" activities. Most of these activities are regulated by other agencies and require permits to proceed. For example, the Maryland Power Plant Research Program conducts its own environmental review and makes recommendations for the issuance of a Certificate of Public Convenience and Necessity. Activities affecting wetlands and navigable waters of the United States require permits from the U.S. Army Corps of Engineers (Army Corps). The Army Corps will participate as a cooperating* *agency with the NRC in the preparation of the EIS. The NRC will consider the environmental impacts of preconstruction activities in the context of cumulative impacts. These impacts will be evaluated in Chapter 4 [and 7] of the EIS.*

Comment: I am also a member of the local community and an advocate of the environment, so I want to ensure that the construction and operation of Unit 3 is done in a way that will have minimal impact on the environment. (**0006-2** [Baummer, Thomas])

Comment: NAACPCCB [National Association for the Advancement of Colored People Calvery County Branch] would like the NRC to conduct a comprehensive analysis of the potential environmental impact of a 3rd reactor at Calvert Cliffs. This impact study should not only consider the impact of the new reactor itself but the potential impact it will have in concert with the other two reactors. (**0017-1** [Brown, Jr., Edsel])

Comment: [W]e again request that you continue to provide an open and transparent public process where everyone has an opportunity to ask questions, express their opinions and learn more about the regulatory process. (**0024-13** [Parran, Wilson])

Comment: We trust the NRC's open process and respectfully request that the NRC keep public comment for the draft environmental impact statement specific to the environmental report findings. (**0024-15** [Hodge, Gary])

Comment: We understand that there will be environmental impacts during construction, several of which have been identified by Unistar. We ask that the NRC look into the identified impacts and during your independent review determine the most appropriate mitigation measures where needed. (**0024-3** [Parran, Wilson])

Comment: We encourage and trust the NRC's open process, and respectfully request that the NRC keep public comment for the draft environmental impact statement specific to the environmental report findings. (**0025-107** [Hodge, Gary])

Comment: [W]e again request that you continue to provide an open, transparent public process where everyone has an opportunity to ask questions, express their opinions, and learn more about the regulatory process. (**0025-17** [Parran, Wilson])

Comment: Last August I asked that the NRC provide assurance that Calvert Cliffs and their partners be given fair regulatory treatment regardless of opposition. (**0025-26** [Martins, Darren])

Comment: We ask that the NRC look into the identified impacts and, during your independent review, determine the most appropriate mitigation measures when needed. (**0025-3** [Parran, Wilson])

Comment: Any shortcomings and deficiencies in this EIS will be protested, will be litigated, and will be legislated. (**0025-41** [Mariotte, Michael])

Response: *The NRC reviews the plans for construction and operation of a proposed unit and evaluates the impacts and mitigation measures. As part of the NRC process, it seeks public comment through the public scoping meetings and the scoping period. Impacts of construction and operation including cumulative impacts with the existing Units 1 and 2 will be described in the EIS.*

Comment: It is our expectation that all of the questions and concerns noted in this letter will be answered by the NRC and Calvert Cliffs Nuclear Power Plant. We hope that your desire is not just to build a nuclear reactor but assist in rebuilding the community and improving the quality of life for the people in the community. (**0018-14** [Mackall, Kimberly])

Response: The *NRC has an obligation under NEPA to identify and disclose the socioeconomic impacts of major Federal actions it undertakes. Socioeconomic impacts will be analyzed in the EIS. However, NRC's authority is limited to regulating the civilian use of nuclear materials. Community and quality of life issues that do not affect nuclear safety are more appropriately addressed by local authorities and the applicant.*

Comment: The Draft and Final EIS—as well as public hearings—must await certification of the EPR reactor design. (**0019-20** [Mariotte, Michael])

Response: *The Design Certification Documentation for the AREVA U.S. Evolutionary Power Reactor proposed for the Calvert Cliffs Unit 3 was submitted to the NRC in December 2007. The review of the design is ongoing. The submitted documentation provided sufficient details to evaluate issues relevant to the EIS. If substantive changes to the design are made as a result of the review, the changes will be evaluated to determine whether a supplement to the EIS will be needed.*

Comment: PPRP attended the NRC public scoping meeting on 19 March 2008, as well as portions of the site audit tour and meetings held on 17 and 18 March 2008. We appreciated the opportunity to meet the NRC staff and to share information about the State-level reviews taking place concurrently with the Federal-level evaluation. We look forward to a continuing open dialogue with the staff on issues important to Maryland. We have no specific input to the NRC's environmental impact statement (EIS) scoping process at this time. PPRP plans to thoroughly review the draft EIS when it is issued and will submit comments as appropriate. We welcome the opportunity to participate in the NRC licensing process for Calvert Cliffs Unit 3 and look forward to further interaction in the NRC's development of the EIS. (**0022-1** [Gray, Susan])

Response: The *NRC appreciates the opportunity to include the State of Maryland among the stakeholders participating in the licensing process for the proposed Unit 3 at the Calvert Cliffs facility.*

2. Comments Concerning Site Layout and Design

Comment: When UniStar Nuclear picked this design, we picked this design because of the two containments, the four safety trains, the amount of concrete and steel that is in this design. (**0024-113** [Vanderheyden, George])

Comment: [O]ur design is being constructed all over the world. It has already been approved by two regulatory agencies in two different countries, Finland and France. Our hope is, is that, as we go through this extensive open process with the NRC, that the U.S. Government and the Nuclear Regulatory Commission will be the third country and third regulatory agent to fully review and approve this design. (**0024-115** [Vanderheyden, George])

Comment: This design that we will produce is also going to have a very small environmental impact. We're the ones that are going to build a cooling tower that's not 5[00] or 600 feet like most people are used to seeing in the press, I mean in pictures. It's a 168 feet. It's going to have plume abatement on the cooling towers which means that vapor trail that people see that goes up into the air, you won't see that from our power plant. (**0024-118** [Vanderheyden, George])

Comment: [W]e're going to put a desalinization plant in. We're going to take a small amount of the Chesapeake Bay water, remove the salt, make fresh water with it and use it to provide the power plant systems. (**0024-119** [Vanderheyden, George])

Comment: UniStar has taken several additional key steps to minimize the environmental impact by selecting a hybrid cooling tower designed much lower to the ground and one that will take in approximately 98 percent less water from the Chesapeake Bay than the existing Calvert Cliffs Units 1 and 2, and a desalination plant that eliminates the need to use area groundwater sources once the plant is operational. (**0024-2** [Parran, Wilson])

Comment: I trust that since this may be the first design of this type in the United States but it's not just being reviewed by the NRC, it's being reviewed by other nations as well. (**0024-96** [Scarafia, Bill])

Comment: [W]e are the design that has the double containment building. The containment building, of course, is what houses the nuclear reactor subject to many of people's points. It is typically that four- to seven-foot thick concrete dome around it. Well, we have a second dome around ours. We have double containments. (**0025-168** [Vanderheyden, George])

Comment: Our design – and we will prove it in our safety analysis – is capable of handling a direct impact from a military aircraft, a personal aircraft, and a large commercial aircraft. (**0025-169** [Vanderheyden, George])

Comment: We are the design that will have 99 percent less heat input into the Chesapeake Bay. We will use 98 percent less cooling water than the existing two units use at Calvert Cliffs. We are going to do that through a new hybrid cooling tower. (**0025-171** [Vanderheyden, George])

Comment: It's a low cooling tower, only 168 feet, not 600 feet that you see at many of these power plants. And it's even going to have plume abatement on it, so you don't see that vapor trail going up into the sky. (**0025-172** [Vanderheyden, George])

Comment: I am well aware of the concerns of the quality of our groundwater and the amount of groundwater we have left in our aquifers here because of the continued population growth we are all seeing. So we decided to spend an additional $47 million to put a desalinization plant in, so that the plant will draw water from the Chesapeake, desalinate it, it turns out to be a small amount of water, and not use the groundwater. (**0025-173** [Vanderheyden, George])

Comment: UniStar has taken several additional key steps to minimize the environmental impact by selecting a hybrid cooling tower designed much lower to the ground and one that will take in approximately 98 percent less water from the Chesapeake Bay than the existing Calvert Cliffs Units 1 and 2, and a desalination plant that eliminates the need to use area groundwater sources once the plant is operational. (**0025-2** [Parran, Wilson])

Response: *These comments relate to UniStar's proposed plant design, cooling system, and plume abatement measures. Some, like the plan to build a desalination plant for cooling the reactor, relate to design measures intended to minimize resource use. The site layout, the reactor type, and the cooling water systems will be described in Chapter 3 of the EIS.*

Comment: I drive past the plant on Route 2/4 every day on my way back and forth to work. There are no visible clues that there is any kind of industrial activity there, except the signs at the entrance of the plant. No smokestacks, no smoke, no railway cars, no lines of trucks in and out, and no pipelines. (**0025-133** [Sinclair, Jim])

Response: *This comment reflects the lack of visible indications of industrial activity when viewing the plant entrance and surrounding site from the highway. An aesthetics evaluation of the proposed plant siting will be discussed as part of the socioeconomics analysis in the EIS.*

3. Comments Concerning Land Use – Site and Vicinity

Comment: How will clearing of additional land and any changes to the shoreline and cliffs impact the environment immediately surrounding the plant? (**0006-8** [Baummer, Thomas])

Response: *The land use and ecological impacts of constructing and operating the proposed new nuclear unit will be examined in Chapters 4 and 5 in the EIS.*

4. Comments Concerning Land Use – Transmission Lines

Comment: Constellation representatives have not to my knowledge explained to Calvert County how they will export the additional 1600 MW out of the County and into "the grid". Supporters of the new reactor seem to believe that Unistar will be able to upgrade the existing corridor, without having to condemn additional land from adjacent property owners. In contrast to Constellation/Unistar, representatives of the MAPP project have indicated that they do not intend to widen their 500 kV connector from Calvert Cliffs to Chalk Point—rather, they intend to upgrade the cables and towers. MAPP also plans to embed a 500 kV connector at shallow subbottom depth under the Chesapeake, thereby creating a connection with the Eastern Shore. (**0005-14** [Vogt, Peter])

Comment: [A]ny widening of the transmission corridor would have extremely negative effects on adjacent homeowners and on land owners who have gone the extra mile to preserve their land privately, thinking it would be 'in perpetuity'. Perhaps the worst impacts would fall on the large area of nature preserve in the watersheds of Parkers Creek and Governors Run. The environmental viability of this preserve area is already negatively impacted by the existing corridors, which fragment the forested preserve. (**0005-15** [Vogt, Peter])

Comment: The EIS needs to require any new reactor to export its power within the existing corridor. If necessary, pay the price of undergrounding—it's possible but costs more. (**0005-16** [Vogt, Peter])

Response: *The possible need for any additional land for transmission will be addressed in Chapter 4 of the EIS. If new land is needed, associated environmental impacts will also be addressed in the EIS.*

Comment: [W]hen comparing the impact of generating new power at Calvert Cliffs vs. at other potential sites, the EIS needs to compare the lengths of transmission corridor required to get the power into the grid. This would include the added line losses, transmission line and tower construction and maintenance costs for a longer corridor, as well as the environmental costs of keeping natural forest from reclaiming the corridors. (**0005-17** [Vogt, Peter])

Comment: We would like to make certain that our citizens understand one key construction fact: there are no new transmission corridors necessary to build Unit 3. It is important to note that Unit 3 not be confused with other proposed utility improvement projects in Calvert County. The 500kv transmission line currently serving Calvert Cliffs will accommodate the expansion with some upgrades to substations. (**0014-2** [Clark, Gerald] [Kelley, Linda] [Parran, Wilson] [Shaw, Susan] [Stinnett, Barbara])

Comment: [N]o new transmission corridors are needed to build Unit 3. We note this because it is important not to confuse the construction of Unit 3 with the other proposed utility improvement projects in Calvert County and we have several other projects in Calvert County that are not related to the building of Unit 3. (**0024-4** [Parran, Wilson])

Comment: [I]t is important not to confuse the construction of the Unit 3 and other proposed utility improvement projects in Calvert County. The 500-kilovolt transmission line currently serving Calvert Cliffs will accommodate the expansion with some upgrades to the substation (**0025-5** [Parran, Wilson])

Response: *The environmental impacts associated with transmitting power from the proposed new unit to the grid will be addressed in the EIS.*

5. Comments Concerning Meteorology and Air Quality

Comment: Will the water circulating in the cooling tower be raw bay water or treated or desalinated water? Any chemicals in this water, as well as salt and other minerals, are likely to be carried into the air and the local environment. The effect of this should be evaluated. (**0006-5** [Baummer, Thomas])

Comment: Is the plume abatement system on the cooling tower likely to work effectively throughout the plant's life? Or will a certain level of effectiveness be required? Legionnaire's disease and particulate salt emissions (with its effects on the local ecology and on nearby cars and equipment through corrosion) are two significant concerns. (**0006-6** [Baummer, Thomas])

Response: *The reactor cooling system including the water source and treatment and its operation will be discussed in Chapter 3 of the staff's EIS. The potential impacts of the cooling system operation will be addressed in several sections of Chapter 5 of the EIS. For example, impacts of drift on vegetation will be addressed in the section on terrestrial ecology, the potential impacts on human health will be addressed in the section on non-radiological health effects, and the aesthetics of cooling tower plumes will be addressed in the section on socioeconomic impacts.*

Comment: The EIS should fully examine the potential effects of climate change on the Calvert Cliffs 3 facility, including the possibility of severe weather-induced accidents. For example, tornados are occurring with greater frequency in the region and a strong tornado nearly hit the Calvert Cliffs site just a few years ago, whereas 30 years ago tornados were a rarity in the mid-Atlantic region. The EIS should consider the effect of stronger and more frequent tornados hitting the Calvert Cliffs site directly. (**0019-29** [Mariotte, Michael])

Comment: The EIS should address the effects of larger and more frequent hurricanes directly hitting the Calvert Cliffs site. (**0019-30** [Mariotte, Michael])

Comment: What is the effect of climate change on the operations of this plant? This plant would operate for at least 40 years, perhaps 60 years. It won't be online for another 10 years, so we are really projecting late this century the impacts of this plant. (**0025-45** [Mariotte, Michael])

Comment: What are the effects of the increasing likelihood of increasingly strong storms, tornadoes, on this plant? Is this plant being built to accommodate that? (**0025-46** [Mariotte, Michael])

Response: *The comments express concern over the effects of the environment on the operation of the plant. Evaluation of the design to withstand severe weather conditions is part of the licensing process, but outside the scope of the EIS. Wind loadings, tornados, and floods will be considered in the staff's safety evaluation report.*

Comment: The EIS should address the possible impacts of climate change on the Chesapeake Bay and the water supply for Calvert Cliffs-3. (**0019-31** [Mariotte, Michael])

Response: *The comment expresses concern over the effects of the environment on the operation of the plant. Evaluation of the water requirements to maintain the plant in a safe condition is part of the licensing process, but outside the scope of the EIS. The capability of the water supply source to provide necessary cooling of the reactor and essential equipment will be evaluated in the staff's safety evaluation report.*

6. Comments Concerning Geology

Comment: Careful mapping of the Miocene-aged sediment layers outcropping along the Calvert Cliffs has been done and published subsequent to the construction of the existing power plant in the mid-1970s. This new mapping shows--more accurately than was known before– he layers to be gently dipping (tilted) down to the southeast, and not disrupted by faults—except at one site, located about 1 mile south of the Calvert Cliffs Nuclear Power Plant, just north of Rocky Point. At this place along the cliffs, the layers appear to be offset a couple meters—that is, the layers are not continuous. The offset is such that the layers to the south are higher than those on the north. Detailed geological examination is needed to prove that the offset is not due to mapping errors--unlikely--, and, if a fault is indicated, boreholes will be needed to establish its strike (trend) and dip. (**0019-35** [Mariotte, Michael])

Response: *The EIS will contain a short description of local geology. Geotechnical and seismic issues are addressed in Chapter 2.5 [Section 2.8] of the staff's Safety Evaluation Report.*

7. Comments Concerning Water Resources

Comment: What will be done with the salt and other minerals extracted by the desalination plant? Returning these to the bay will have a disturbing effect on the salinity and ecology of the area. (**0006-4** [Baummer, Thomas])

Response: *Water quality impacts of operation of the plant will be evaluated by the staff and described in Chapter 5 of the EIS. This assessment will include consideration of the impacts of the effluents from the desalination system and its effect on aquatic ecology.*

Comment: How will sediment and chemical runoff be controlled during construction? (**0006-7** [Baummer, Thomas])

Response: *Water quality issues associated with construction activities will be assessed by the staff and discussed in Chapters 4 and 7 of the EIS. Control of pollutants in runoff is regulated by the State.*

Comment: You should address what effect runoff from the pre-construction activities will have on the Bay. (**0025-93** [Fisher, Allison])

Response: *The impacts of preconstruction activities will be considered in the staff's review of cumulative impacts. The assessment of cumulative impacts will be discussed in Chapters 4 and 7 of the EIS.*

Comment: [W]hat benchmarking can we do with regard to effluents to the Bay when we compare it to non-nuclear power plants that use the same water supply? (**0024-110** [Buchanan, Bill])

Response: *It is unclear whether this question refers to general or radiological effluents. General effluents are largely related to the amount of water used in the cooling system, its temperatures, and any water treatment chemicals used. Liquid effluents are regulated through the facility's National Pollutant Discharge Elimination System (NPDES) permit. Aside from the cooling system, the primary feature distinguishing the liquid effluents from a nuclear power plant with a non-nuclear power plant is that a nuclear plant discharges a small quantity of radionuclides into the normal effluent, and this quantity is limited by NRC regulation. Ambient radiological monitoring is conducted in the Bay to verify its quality. Current surface water quality and proposed impacts to the surface water from construction and operation of a new unit will be discussed in the EIS.*

8. Comments Concerning Ecology

Comment: According to Constellation sources, ca. 300 acres will have to be cleared of forest for new reactor construction. This forest forms part of the two remaining Calvert County areas of relatively contiguous forest, which represent “bioreserves”, for example for successful reproduction of numerous neotropical migrant bird species, whose populations have been steadily declining (at rates from ca. 1 to several % per year, depending on species) throughout the eastern US for some decades. One of the two areas extends from Flag Ponds Nature Park across through the Constellation forest buffer zone, and down into the Calvert Cliffs State Park and the buffer zone around the Dominion LNG terminal area. The Calvert Cliffs forest buffer zone, managed for wildlife under the WHIP program by the operator, is actually better for Forest Interior Dwelling species (FIDs) than parks opened to the public, which are more prone to disturbance. [The] 300 contiguous acres of forest lost to the new reactor would probably comprise the biggest single loss of contiguous forest (the ecologically valuable type) in Calvert County for decades, if not ever. The EIS needs to estimate the resulting loss of nesting sites etc. from the clearing of these 300 forested acres. (**0005-13** [Vogt, Peter])

Response: *Impacts to terrestrial resources from construction of the proposed unit, including changes in the landscape, will be discussed in Chapters 4 and 7 of the EIS.*

Comment: [T]he damage to wildlife from small releases should be contrasted with the damage to habitat that would result from the construction of thousands of wind turbines, either on or offshore, or the conversion of thousands of square miles of farm and forest to bioenergy production. (**0025-59** [Meadow, Norm])

Response: *Impacts of the construction and operation of the proposed unit on environmental resources will be discussed in Chapters 4 and 5 of the EIS. Impacts of alternative energy sources will be discussed in Chapter 9.*

Comment: [The EIS] must assign considerable importance to damage to habitat which diminishes both biological diversity and complexity. (**0028-2** [Meadow, Norman])

Response: *A discussion of the impacts of construction and operation of the proposed units and their impact on the environment will be discussed in Chapters 4 and 5 of the EIS.*

9. Comments Concerning Socioeconomics

Comment: I’ve lived here in Calvert for 25 years. All the farms are gone. They want to build new schools. Subdivisions are everyw[h]ere. But I guess no one thought about that. Calvert County Commissioners are not for the quality of life for this county. All they can think of is the next dollar in their pocket. (**0002-2** [Boswell, William])

Response: *Socioeconomic issues including existing land development and regional schools and changes resulting from the addition of the proposed new unit will be discussed in Chapters 4 and 5 of the EIS.*

Comment: The EIS needs to estimate the likely number of new children added to the school system as a result of a new reactor- and take into consideration that the new employees will likely be in their prime child-producing years. (**0005-11** [Vogt, Peter])

Comment: Your risk assessment must consider rapid population growth in the Calvert Cliffs Nuclear Power plant region. Calvert County itself has grown from ca. 20,000 when the first two units went online, to nearly 90,000 today. (**0005-4** [Vogt, Peter])

Comment: Constellation must demonstrate that its staff will have access to reasonable housing. Since Calvert County has limited apartment availability, plans must be established to ensure that the staff of the new reactor can acquire living quarters in the county. Over the last several years there have been major issues with healthcare, law enforcement, and other key professionals finding it difficult to acquire housing in the county. (**0017-9** [Brown, Jr., Edsel])

Response: *Socioeconomic impacts such as impacts on population, schools, public services, and housing associated with the construction and operation of a new unit at Calvert Cliffs will be considered in Chapters 4 and 5 of the EIS.*

Comment: EIS statisticians should be able to estimate, with some range of caveats/assumptions, the probable mean traffic delay imposed by reactor construction and operation, and what a mean 1 minute daily traffic delay would cost annually, as well as the likely number of additional accidents per year. Even neglecting the delays and cost due to increased accidents, I roughly estimate the total annual cost for every 1 min traffic delay at from $5 million to $50 million. It is unacceptable that this cost is ignored just because it is (like investor risk) dispersed among many thousands of people. (**0005-10** [Vogt, Peter])

Comment: Constellation states that the proposed third reactor would provide several thousand construction jobs and several hundred permanent jobs. Many of these new jobs, as well as visitors, and delivery trucks, will add substantial traffic to MD 2/4, which at present is a congested and dangerous highway. (**0005-6** [Vogt, Peter])

Comment: Traffic on this highway has been increasing even faster than the population-and Calvert has been at or near the top of population growth rates among Maryland counties for decades: Your estimate needs to consider the trend when you estimate traffic impact when reactor construction might begin. (**0005-8** [Vogt, Peter])

Comment: MD 2/4 is currently near failure (categories D or worse), especially during rush hour. The counter near Prince Frederick has reached 40,000 vehicles per day, and much of the new reactor traffic would have to pass through Prince Frederick. Your assessment needs to acknowledge the ‘stutter-step’ response of infrastructure (e.g., roads, schools, airports, etc.) to growth. (**0005-9** [Vogt, Peter])

Comment: [With regard] to the potential impact on traffic patterns in Calvert County as a result of the new reactor. With increased staff, deliveries, and related businesses to support the site expansion, what plans are being put in place to assure that the expansion will have little or no impact on travel. (**0017-7** [Brown, Jr., Edsel])

Response: *Socioeconomic impacts such as impacts on transportation and local infrastructure associated with the construction and operation of the Unit 3 will be considered in Chapters 4 and 5 of the EIS.*

Comment: The EIS process should include impartial estimates showing a breakdown of job and pay categories, in terms of the % likely filled by county residents. (**0005-12** [Vogt, Peter])

Response: *Socioeconomic impacts such as labor impacts associated with the construction and operation of Unit 3 will be considered in Chapters 4 and 5 of the EIS.*

Comment: Calvert Cliffs has served the citizens of Calvert County well over the past decades as the leading employer in our county. Additionally, Calvert Cliffs has contributed sixteen million dollars annually in taxes, which accounts for nine percent of the county’s total revenue. Calvert Cliffs has assisted the county in numerous donations to various organizations and countless students. I have seen many positive results from their presence in Southern Maryland. I can truly say that Calvert Cliffs has greatly enriched our county and allowed for a better quality of life while meeting the energy needs of Maryland. (**0015-5** [O’Donnell, Anthony])

Comment: The reality of the fact is that nuclear power plants are going to be built in this country somewhere and at some time and there’s no reason why this county and this region should not enjoy those economic benefits that I talked about earlier today and if it’s job creation in this county that are good paying jobs with good benefits that aren’t necessarily when we talk about the construction jobs as temporary jobs, those are not temporary jobs. They will afford —

with the rising costs of college education today many people will not be able to viably afford to go to college and our young people will have an opportunity to enter into the trade, learn a skill, get educated while they earn money and have a lifelong career with benefits, a defined benefit plan, and a health and welfare plan where they can take care of their needs. (**0024-107** [Karbowsky, Brad])

Comment: [A] nuclear plant makes a good neighbor, as many people here tonight have already indicated. It supports high-paying jobs directly at the plant, generates additional jobs in the community where it is located, and contributes by helping build good schools, roads, and other civic improvements. (**0024-26** [Kanaley, Mike])

Comment: We must seek and support development that will stimulate our economy, provide jobs, additional tax revenue, and new business opportunities. We have to be open-minded and flexible when considering what we're up against. We have to keep an eye on the important role that Calvert Cliffs plays in our economy. (**0024-29** [McClure, Deborah])

Comment: I read a letter to the editor recently blasting this potential expansion as related to a number of items, including job growth, the limited availability of labor and the fact that most of the higher-paying jobs related to the plant expansion would be highly specialized, with the eligible employee pool mostly trained on Navy nuclear submarines. Not only is this not true, I couldn't disagree more with that premise. It is true that the Navy trains many, many nuclear workers, but the fact is that universities across the United States, almost 900 of them, offer fields of study in undergraduate nuclear energy programs. (**0024-42** [Chambers, Bill])

Comment: [B]ecause job creation is critical here locally in Calvert County, an expanded Calvert Cliffs would be a huge economic and socioeconomic boon for Calvert County and the State of Maryland. (**0024-43** [Chambers, Bill])

Comment: So I ask the NRC to review the impact an expanded Calvert Cliffs may have on education and this request is not meant to be negative at all. In fact, I'd like this raised because I believe that creating opportunity for our local youth will allow our children to live and work in the community in which they are raised. (**0024-44** [Chambers, Bill])

Comment: The economy is in an area right now where we need jobs such as the third reactor coming to Calvert Cliffs. We as union employees are in a turmoil right now. That plant alone would bring most crafts back up to standards and that's what we are looking forward to. (**0024-56** [Parran, Wilson L.])

Comment: When we look at the potential for this new facility and the 2,000 on up construction jobs, another economic benefit. When we look at the 400 potential permanent jobs after completion, high-paying technically advanced jobs. (**0024-93** [Scarafia, Bill])

Comment: Our communities throughout Southern Maryland have all collaborated to build a feeder system throughout our public schools and our higher education in the areas of science, technology, engineering and math, what everybody in the country is calling STEM, so that our citizens will be able to produce the kind of workers that they will need and as one speaker said earlier, we will now have another opportunity for our local graduates to live and work here. (**0024-94** [Scarafia, Bill])

Comment: A nuclear power plant also makes a good neighbor. It supports high-paying jobs directly at the plant. It generates additional jobs in the community, and I have been told, and I have read, that for every job created at a plant three jobs are created in the community. And I believe it is 400 jobs that are going to be created, so that's 1,200 additional jobs in the community. (**0025-123** [Walther, Robert])

Comment: The community will benefit from the many construction jobs created over the near term, and permanent jobs long into the future, once the plant becomes operational. (**0025-137** [Sinclair, Jim])

Comment: The new plant will also make a significant contribution to the Calvert County tax base, which is already greatly supported by the existing units, reducing the burden on individual taxpayers. (**0025-138** [Sinclair, Jim])

Comment: In these tough economic times, it is economic development like the construction of a third reactor at Calvert Cliffs that will help provide the socioeconomic push many of our small businesses need to stay afloat and prosper. Solomons Business Association welcomes that development and looks forward to the new jobs, new businesses, and new visitors that it will bring to our region. (**0025-175** [Tarhan, Diane])

Comment: [T]he positive economic benefit that will come from the expansion and adding this third reactor at Calvert Cliffs, some $20 million in new revenue resources that would come just to Calvert County alone. (**0025-35** [Burton, Bob])

Comment: And let me just say that the environmental impact can be positive not only during and after the new reactor is put into place, but these additional monies that will come into Calvert County will be used to improve, upgrade, and expand infrastructure, public education, and public safety. (**0025-36** [Burton, Bob])

Comment: [W]hen we have the opportunity in our local jurisdictions, and the funding, to be able to go in there and upgrade this infrastructure, it will have to meet the new environmental standards, which will help create a cleaner environment for our communities when we begin upgrading this infrastructure. (**0025-37** [Burton, Bob])

Comment: When we begin putting additional monies into public education, we can expand the program offerings, as it was noted here earlier, in the area of math and science and engineering. (**0025-38** [Burton, Bob])

Comment: [W]e are talking about an infusion of jobs to this region of 2,000 construction jobs, many of which whom the last time there was a construction plant built in this county stayed here, with high-paying jobs that have high paying benefits that do not take from the county and the region's government, but actually give back to those positions. (**0025-78** [Karbowsky, Brad])

Comment: It brings forth the ability of our young people to enter into the construction trade, as an alternative to going to college, for those who can't go to college with the skyrocketing costs of college, and provide opportunities for our residents to have jobs and stay in this county and live in this county. (**0025-80** [Karbowsky, Brad])

Comment: The estimated 2,000 to 4,000 construction jobs will be an economic boost to our region, but then the subsequent 400 permanent jobs will be well placed here, because in St. Mary's County and the rest of our region you will see that we have developed a huge technology base where people will be able to come with their expertise and blend and feel comfortable in this community. (**0025-82** [Scarafia, Bill])

Response: *These comments generally express support for the Calvert Cliffs Unit 3, based on the potential positive socioeconomic impacts it would be expected to bring to the region. Socioeconomic impacts of construction and operation will be discussed in Chapters 4 and 5 of the EIS.*

10. Comments Concerning Historic and Cultural Resources

Comment: [I]n the environmental report submitted by Unistar, they identify parcels within the proposed project area that is potentially eligible for the national registry of historic places. Since they're a moderate to high potential for containing archaeological resources in this general area, what mitigation measures will be required in order to protect the integrity of these resources, especially since they are no longer considered within the purview of the EIS? (**0025-94** [Fisher, Allison])

Response: *The NRC will comply with the National Historic Preservation Act (NHPA) through its normal NEPA process. Impacts to historical resources and possible mitigation measures will be discussed in Chapters 4 and 5 of the EIS. Then NHPA does not grant the authority to impose mitigation to the NRC. The applicant will need to work with the Maryland Historical Trust to identify any necessary mitigation measures.*

11. Comments Concerning Environmental Justice

Comment: African Americans make up about 13% of the population of Calvert County. A majority of African Americans live within 1 to 10 miles away from the nuclear power plant. There are several schools in close vicinity to the nuclear power plant and will be effected by the decision of the NRC. History tells us that prior to the new concepts of environmental justice and racism the African American neighborhoods have been recipients of toxic landfills and other hazardous materials. Due to the negative historical data throughout the country and potential of an emergency CBW would like to ask the following questions [all but the one below which are listed in the sections based on subject matter]. (**0018-2** [Mackall, Kimberly])

Comment: How are you implementing Environmental Justice Executive Order 12898 at the Calvert Cliffs Nuclear Power Plant? (**0018-3** [Mackall, Kimberly])

Response: *The NRC Environmental Justice Policy is available in the NRC Electronic Reading Room at http://www.nrc.gov/reading-rm/doc-collections/commission/policy/69fr52040.pdf. The policy states that NRC will identify and disclose disproportionately high and adverse impacts that fall heavily on a particular community as a result of a proposed agency action. The NRC will perform its environmental justice analysis through its NEPA review process. Environmental justice is evaluated on a plant-specific basis and will be addressed in Chapters 4 and 5 of the EIS.*

12. Comments Concerning Health – Radiological

Comment: I took a course in the history of the nuclear industry at university, studying under one of the most respected academic specialists on the subject. He says that there is no real 'safe' level of radiation for humans to be exposed to. All radiation is damaging, no matter what the nuclear companies say. (**0007-3** [Shannahan, Brittany])

Comment: What are your clean up standards? What are the standards for air quality and water quality? (**0018-10** [Mackall, Kimberly])

Comment: The EIS should address the additional cumulative effects of routine radiation releases on nearby populations and on aquatic life in and around the Chesapeake Bay from Calvert Cliffs-3, given 11 nuclear reactors (Susquehanna 1 & 2, Three Mile Island 1, Peach Bottom 2& 3, Calvert Cliffs-1 & 2, North Anna 1& 2, Surry 1& 2) already releasing radiation into the Bay. (**0019-22** [Mariotte, Michael])

Comment: [W]ith an accident at a nuclear power plant, it's, of course, different than an accident elsewhere. There is radioactive material that would be dispersed and citizens are at risk of ingestion and inhalation. Radioactive iodine can be a cause of thyroid cancer and then the other radioactive material can be risk factors down the line for cancers in the future. (**0024-68** [Dubois, Gwen])

Comment: [T]he scientific requirements for valid analysis of risk are clearly described in the publications of the National Research Council, known as the BEIR reports, B-E-I-R. And these should be carefully considered. The reports clearly state that the best estimates of risk are from studies for which there are data on individual dose, and for which an appropriate control population is available. (**0025-57** [Meadow, Norm])

Comment: The scientific requirements for valid analysis of risk are clearly described in publications of the National Research Council known as the BEIR Reports, which should be considered carefully. These reports clearly state that the best estimates of risk are from studies for which there are data on individual dose, and for which appropriate control populations are available. (**0028-28** [Meadow, Norman])

Comment: When evaluating risk from accidents of the magnitude of that at Three Mile Island (TMI), the quality of the available studies should be evaluated by the criteria in the BEIR Reports. (**0028-29** [Meadow, Norman])

Comment: The results most often given to the public are from weak, ecological studies; the paper most frequently cited by opponents of nuclear power as demonstrating that the releases at TMI2 caused damage to health is an ecological study. Two other groups of qualified researchers have not found evidence of cancer caused by TMI. (**0028-30** [Meadow, Norman])

Comment: The rate of incidence of cancer proposed by Wing, et al. is inconsistently high when compared to the rates that have been reported from exposures that were orders of magnitude higher than those which occurred at TMI [Three Mile Island]. ... This is one of the more convincing pieces of evidence that caused the MCC to conclude that there is no credible evidence that accidents at water moderated reactors have caused harm to health. (**0028-31** [Meadow, Norman])

Comment: Virtually all oncologists believe that solid tumors do not become clinically manifest until at least 5 years, and more often at least 10 years after the event that turns a cell malignant. (**0028-32** [Meadow, Norman])

Comment: [W]e believe that the potential for harm from commercial water-moderated nuclear reactors has been unjustifiably exaggerated, and that there is no credible evidence for death or cancer attributable to their operation. (**0028-5** [Meadow, Norman])

Response: *The NRC's regulatory limits for radiological protection are set to protect workers and the public from the harmful health effects of radiation on humans. These limits are presented in 10 CFR Part 20, "Standards for Protection Against Radiation" and are based on recommendations of national and international standards-setting organizations and the National Research Council's committee reports on the Biological Effects of Ionizing Radiation (the BEIR reports). The effects on workers and the public and environment from cumulative radiological releases from the proposed Unit 3, including those from Calvert Cliffs Units 1 and 2, will be described in Chapter 7 of the EIS.*

Comment: [W]hen investigating the environmental consequences of an accident at the proposed reactor, the EIS should consider many reports on the effects of radioactivity on wildlife, some of which are from carefully controlled experiments. Humans appear to be among the species most sensitive to radioactivity, which means that most other things out there are less sensitive. (**0025-58** [Meadow, Norm])

Comment: When evaluating the environmental consequences of an accident (environmental in the context of the preservation of nature) at the proposed reactor, the EIS should consider many reports on the effects of radioactivity on wildlife [footnote 5] and not gratuitous statements that extrapolate exaggerated claims of health damage from humans to the rest of the biological world. Humans appear to be among the species most sensitive to radioactivity. (**0028-33** [Meadow, Norman])

Response: *The radiological impacts of reactor operation, including impacts to biota, will be addressed in Chapter 5 of the EIS.*

Comment: The EIS must fully address the impact on flora and fauna in the Chesapeake Bay caused by Calvert Cliffs-3's planned release of 525,000 gallons per year of radioactive waste into the Bay, as indicated by Constellation Energy's Response to Question 1-13 of the Maryland Public Service Commission. (**0019-17** [Mariotte, Michael])

Comment: [A]ccording to documents filed with the Maryland Public Service Commission, this plant is going to dump 525,000 gallons per year of liquid radioactive waste into the Chesapeake Bay. What are the effects on the flora and fauna of that dumping? That is something that has to be looked at in the EIS and addressed carefully. (**0025-53** [Mariotte, Michael])

Response: *These comments concern the environmental impacts of liquid radioactive effluents on aquatic ecology during normal operations. The NRC staff will discuss such impacts in Chapter 5 of the EIS.*

13. <u>Comments Concerning Accidents</u>

Comment: While the nuclear reactor is said to stimulate the economy within Calvert County, CBW's [Concerned Black Women of Calvert County] primary concern is regarding the quality of life of the people who live near and are at risk if an accident occurs. CBW believes that the family is the foundation and core of the community. In order for the family to be viable the people must have the right to a clean, safe, just, healthy, and sustainable environment. (**0018-1** [Mackall, Kimberly])

Comment: What is your worst case scenario for a potential accident? What preventative measures will you put in place? (**0018-9** [Mackall, Kimberly])

Comment: I would even point out if an evacuation is carried out without a hitch, what does that mean if there's a major radioactivity release from Calvert Cliffs? That could mean that people can never come back. (**0024-84** [Kamps, Kevin])

Comment: One melt down of one of those plants – it's sci fi horror films manifested! (**0026-3** [Marsh, Rauni])

Response: *The staff's EIS will address the potential impacts of operation of the proposed reactor on public health and safety in Chapter 5. There will be sections on potential radiological and nonradiological impacts of normal reactor operation on public health. There will also be a section on the potential impacts of postulated reactor accidents on public health and the environment.*

Comment: The EIS should describe and address the potential consequences of a beyond design basis accident at Calvert Cliffs-3 and should address potential additional risks of its First-of-a-Kind reactor design. (**0019-18** [Mariotte, Michael])

Comment: Because the scoping period of this EIS is occurring well in advance—literally, years in advance—of certification of the EPR design chosen for this reactor site, we have to defer additional comments on the safety issues related to this project. However, we fail to understand how the EIS can possibly address the fundamental issue of the environmental consequences of a severe accident without knowing the specific vulnerabilities of the chosen reactor design. (**0019-19** [Mariotte, Michael])

Comment: This design does not exist anywhere in the world. There are no operating EPRs anywhere in the world. And one of the most important things that an EIS does is examine the potential environmental consequences of a severe accident. But until you know the design strengths and weaknesses, and how they will be implemented, you don't know what the potential accident is. (**0025-43** [Mariotte, Michael])

Response: *The staff's EIS will address the potential environmental impacts of postulated design-basis and severe accidents in Chapter 5. The U.S. EPR was selected as the design for the proposed Calvert Cliffs Unit 3. In a separate action, the staff is evaluating the potential consequences of design-basis accidents and the probability and consequences of severe accidents for the U.S. EPR as part of its review of the application for certification of the reactor design. A detailed description of the design certification review is beyond the scope of the EIS. However, the staff uses well-established methods to analyze a new design to determine the potential consequences of accidents. The results of the certification review process will be compared to the results of the evaluation of the environmental impacts of potential radiological releases to assure consistency.*

Comment: The EIS should address the potential adverse environmental impacts of an accident involving a significant release of radiation from at Units 1 & 2 on the safe operation of the new co-located unit. (**0019-23** [Mariotte, Michael])

Comment: The EIS must address possible consequences to Unit-3 of an accident at the Units 1 & 2 fuel pools and/or at their dry cask storage units. (**0019-8** [Mariotte, Michael])

Comment: I just wanted to point out the risks that will come with having two old reactors at Calvert Cliffs combined with having a new reactor at Calvert Cliffs. (**0024-76** [Kamps, Kevin])

Comment: The most recent such report that the agency has done way back in 1982, and the peak early fatalities that they estimated for Calvert Cliffs 1 and 2 were 5,600 peak early fatalities at each reactor in a major accident. The peak early injuries were 15,000 at each reactor. The peak cancer deaths were 23,000. So that's a lot of injuries and deaths. A grand total of 87,200 deaths and injuries if there's a major accident involving both reactors at that site right now. Adding a third reactor would add more risk there. (**0024-77** [Kamps, Kevin])

Response: *In Chapter 5 of the EIS, the staff will address risks associated with both normal operation of the proposed reactor and postulated severe accidents. The staff will also address the cumulative risks of operation of the existing reactors and the proposed new reactor.*

Comment: The EIS should address potential consequences of a serious accident in the irradiated fuel pool at new sites and in other potential high-level radioactive waste storage facilities. (**0008-3** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard] [McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya]

[Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-Meere, Susan] [Walsh, Donald] [Walters, Betty] [Wanner, Gabrielle] [Ward, John] [Welch, Irene] [Wilkins, Paul] [Willoughby, CaraLea] [Wilson, Deb] [Yeatts, Jordan] [Zastawecky, Margaret] [Zelikson, Linda])

Comment: The EIS must address potential consequences (on the Bay, on people, on flora and fauna in the region) of a serious accident in the irradiated fuel pool at Calvert Cliffs-3, and in other potential high-level radioactive waste storage facilities. (**0019-7** [Mariotte, Michael])

Response: *The staff will assess the impacts of postulated fuel handling accidents in the spent fuel pool in Chapter 5 of the EIS. Evaluation of the consequences of postulated accidents at the Calvert Cliffs Independent Spent Fuel Storage Installation, which is licensed separately, is outside the scope of the environmental review for the proposed reactors.*

Comment: I would point out that if there's an accident at Calvert Cliffs, even a minor one, that there will be radiological stigma associated with that. The NRC should consider that in its socioeconomic analysis. The impact on tourism, the impact on fisheries, the impact on all aspects of the economy in this region, if there's even a small accident at Calvert Cliffs, let alone a major one. (**0024-79** [Kamps, Kevin])

Response: *The environmental review focuses on the radioactive material releases and radiation doses and risks to humans from postulated accidents. The results of the accident evaluation will be presented in Chapter 5 of the EIS. However, environmental impacts related to "radiological stigma" are outside the scope of the review.*

14. Comments Concerning the Uranium Fuel Cycle

Comment: Spent reactor fuel, which some call high level waste, is not a problem. It is easily sealed from the biosphere and stored. Do not succumb to rants and raves. Future generations will much more easily cope with stored spent fuel than with the consequences of global climate change. (**0012-1** [Ireland, John])

Response: *This comment does not provide specific information relating to the environmental effects of the proposed action. It is outside the scope of the EIS and is listed to compile a complete record of the comments received.*

Comment: While I favor increased nuclear power development I am very concerned about the disposal or re-processing of waste. The best idea seems to me to be reprocessing it. We would need to repeal the presidential directive against this but the directive is very out of date with current technology. Be that as it may, we must deal with the waste disposal issue up front! (**0011-1** [Trenholme, Art])

Comment: [T]he EIS should consider recent proposals that storage of spent fuel for several hundred years will reduce its radioactivity to the point where reprocessing will be far less difficult than if it were reprocessed a few years after removal from the reactor. Such intermediate term storage would eliminate the necessity for materials stored in Yucca Mountain to remain physically and chemically stable for hundreds of millennia. (**0025-61** [Meadow, Norm]) (**0028-36** [Meadow, Norman])

Response: *Federal policy no longer prohibits reprocessing. The Energy Policy Act of 2005, P.L. 109-58, authorized the DOE to conduct an advanced fuel recycling technology research and development program to evaluate proliferation-resistant fuel recycling and transmutation technologies that minimize environmental or public health and safety impacts. Additional work is needed before commercial reprocessing and recycling of spent fuel produced in the U.S. commercial nuclear power program is likely. Reprocessing as part of the fuel cycle and waste management will be discussed in Chapter 6.*

Comment: There is going to have to be a method obtained for storage of low-level waste or you are going to shut down a lot of very valuable medical diagnoses, because diagnostic procedures and therapeutic procedures all involve the production of what's known as low-level waste. (**0025-62** [Meadow, Norm])

Response: *This comment expresses the concern for storage and disposal of medical low-level waste. Although waste disposal issues are similar, because medical waste is not generated from nuclear power production, this comment is outside the scope of this EIS.*

Comment: The EIS should address the possible effects of new reactors on existing dry cask irradiated fuel storage units at the plant, including their potential degradation over time as well as the potential impacts of a large expansion of the dry cask units to store high-level radioactive waste from new reactors. (**0008-4** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard] [McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya] [Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-Meere, Susan] [Walsh, Donald] [Walters, Betty] [Wanner, Gabrielle] [Ward, John] [Welch, Irene] [Wilkins, Paul] [Willoughby, CaraLea] [Wilson, Deb] [Yeatts, Jordan] [Zastawecky, Margaret] [Zelikson, Linda])

Comment: The EIS must address the possible effects of Calvert Cliffs-3 on the existing dry cask irradiated fuel storage units at the Calvert Cliffs site, including their potential degradation over time as well as the potential impacts of a large expansion of the dry cask units to store high-level radioactive waste from Calvert Cliffs-3. (**0019-9** [Mariotte, Michael])

Comment: I just want to touch, before I close, on the risks that high-level radioactive waste presents to the Chesapeake Bay and to local residents and residents who live as far away as Prince George's County where I live. There is the risks of storage. The wastes are stored in the indoor pool and the outdoor dry casks. These wastes in the pool and in the dry casks are vulnerable to accidents, they are vulnerable to attacks. (**0025-96** [Kamps, Kevin])

Comment: We are really looking at this dilemma of what to do. We're looking at a century or more of dry cask storage, and people should just remember that these containers are made out of concrete and steel, both of which deteriorate with age and with exposure to the elements. (**0025-98** [Kamps, Kevin])

Comment: The MCC [Maryland Conservation Council] believes that current methods for on-site storage of spent fuel have proven adequate and safe for several decades. (**0028-35** [Meadow, Norman])

Response: *The safety and environmental effects of long-term storage of spent fuel onsite has been evaluated by the NRC, and, as set forth in the Waste Confidence Rule, the NRC generically determined that such storage can be accomplished without significant environmental impact. In the Waste Confidence Rule, the Commission determined that spent fuel can be stored onsite for at least 30 years beyond the licensed operating life, which includes the term of a renewed license. The NRC has a certification process for casks, regulated by 10 CFR Part*

72. Such wastes are under continual licensing control. The uranium fuel cycle will be discussed in Chapter 6 of the EIS.

Comment: [T]o be more accepted by the US society, the nuclear industry must solve the nuclear waste disposal issue, its most prominent Achilles heel. Any attempt at renewing or expanding nuclear power as a source of electricity would be greatly advanced if this issue finally were settled after decades of debate without resolution. If the industry is to renew or expand, now is the time to finally settle the waste disposal issue, both technically and socially. (**0004-5** [Arndt, Gunter])

Comment: Nuclear waste is dangerous and there is no permanent destination where it can be stored safely. Although nuclear power stations provide energy to millions of people in various countries worldwide, no one has come up with a clean and safe solution for what to do with nuclear waste. It will only build up, and should anything happen to it, it will be nightmarish for the local councils to deal with. (**0007-2** [Shannahan, Brittany])

Comment: The Nuclear Waste Confidence Decision provides little solace to the nuclear waste management issue. In the nearly thirty years since the decision was issued we have gotten no closer to licensing a geologic repository. In the meanwhile, high-level radioactive waste is mounting up at 104 reactors sites throughout the country. If the nuclear industry wants to seriously consider moving forward with a new generation of nuclear reactors, then the true cost of waste issues must be evaluated accordingly. (**0008-1** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard] [McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya] [Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-Meere, Susan] [Walsh, Donald] [Walters, Betty] [Wanner, Gabrielle] [Ward, John] [Welch, Irene] [Wilkins, Paul] [Willoughby, CaraLea] [Wilson, Deb] [Yeatts, Jordan] [Zastawecky, Margaret] [Zelikson, Linda])

Comment: The Environmental Impact Statements (EIS) should fully address the potential consequences of permanent storage of high-level radioactive waste. Because there is no permanent storage facility for high-level radioactive waste, and it appears increasingly unlikely that there will be one during the lifetime of a new generation of reactors, the EIS should address how and where all of the high-level radioactive waste will be stored. (**0008-2** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard] [McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya] [Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-

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Comment: We cannot begin to consider the expansion of nuclear power, while the issues of the previous generation remain unresolved. (**0008-6** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard] [McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya] [Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-Meere, Susan] [Walsh, Donald] [Walters, Betty] [Wanner, Gabrielle] [Ward, John] [Welch, Irene] [Wilkins, Paul] [Willoughby, CaraLea] [Wilson, Deb] [Yeatts, Jordan] [Zastawecky, Margaret] [Zelikson, Linda])

Comment: The Environmental Impact Statements (EIS) should fully address the potential consequences of permanent storage of high-level radioactive waste. The EIS should address how and where all of the high-level radioactive waste will be stored. (**0009-1** [Thiele, Abhaya])

Comment: The Environmental Impact Statements (EIS) should fully address the potential consequences of permanent storage of high-level radioactive waste. Because there is no permanent storage facility for high-level radioactive waste, and it appears increasingly unlikely that there will be one during the lifetime of a new generation of reactors, the EIS should address how and where all of the high-level radioactive waste will be stored. (**0010-1** [Polya, Lance])

Comment: How and where will you dispose of hazardous waste material? Where do you currently dispose of waste? How will you manage debris from building the reactor? How much waste do you currently dispose and how much will this increase with the new reactor? What qualifies as hazardous by the regulatory committee? (**0018-4** [Mackall, Kimberly])

Comment: The EIS must address how and where all of the "low-level" radioactive waste Calvert Cliffs-3 can be expected to generate during its lifetime will be stored. (**0019-13** [Mariotte, Michael])

Comment: [T]he EIS should assume that all Class B and above "low-level" radioactive waste generated by Calvert Cliffs-3 will be stored on-site for its licensed lifetime and describe how this material will remain isolated from the environment in perpetuity. (**0019-14** [Mariotte, Michael])

Comment: [T]he EIS should report the amount of "low-level" nuclear waste, in volume and radioactivity, that Calvert Cliffs' operators plan to treat as if not radioactive--that is, plan to send to facilities without specific licenses for nuclear waste. These include solid and hazardous treatment, processing and disposal facilities as well as recyclers whose materials are released for restricted or unrestricted use, and should be identified and the radiological impacts and risks identified. (**0019-15** [Mariotte, Michael])

Comment: Since radioactive waste could remain onsite forever, the site should be evaluated under 10 CFR 61, which include NRC's regulations for the disposal of radioactive waste. (**0019-16** [Mariotte, Michael])

Comment: The EIS must fully address the potential consequences of permanent storage of high- level radioactive waste adjacent to the Chesapeake Bay. There is no currently no permanent storage facility for high-level radioactive waste. Even if the proposed Yucca Mountain site opens during the operating lifetime of Calvert Cliffs-3, this reactor will, by law, not be eligible to have its high-level waste stored there. Thus, the EIS must assume that there will be no available high-level radioactive waste repository for the full operating lifetime (plus possible license extension) of this unit, and the EIS must fully address how and where all of the high-level radioactive waste generated by Calvert Cliffs-3 will be stored on-site, and what measures will be taken to ensure that the radioactivity from this waste remains permanently isolated from the environment. (**0019-6** [Mariotte, Michael])

Comment: [P]lease look carefully and impartially at the problems entailed in dealing with radioactive waste. (**0020-2** [Donn, Marjory])

Comment: [W]e still do not have good ways to deal with the radioactive material that nuclear power produces. I do not believe there is any good way to store it, yet we keep on producing it, poisoning the earth that we will pass on to future generations. (**0020-5** [Donn, Marjory])

Comment: It is true that the Barnwell facility in South Carolina will be closed to low-level waste from the State of Maryland scheduled for June of this year. However, a very large majority, I think it's upward of 75 percent, of the low-level waste generated at commercial nuclear plants in the United States are shipped and disposed of in Clive, Utah, near Salt Lake City. (**0024-103** [McGough, Mike])

Comment: I would point out that Yucca Mountain is looking more and more likely to never open which means that Calvert Cliffs will sit on thousands of tons of radioactive waste if that dump never opens. It already has a thousand tons. It will double or triple or quadruple that amount as time goes on. (**0024-85** [Kamps, Kevin])

Comment: [T]he place where Calvert Cliffs has for decades dumped its so-called low level wastes, Barnwell, South Carolina, is closing for business, at least to the State of Maryland, June 30th of this year. So not only is the high-level waste going to build but so will the low-level waste at Calvert Cliffs. A radioactive waste dilemma with no solution. (**0024-86** [Kamps, Kevin])

Comment: I, as a resident of this state, don't want to be creating a waste product that has to be forced down the throats of the people in another state, especially if there is a reasonable alternative ... You know, we are just now becoming aware of the fact that we are releasing a lot of pollutants into the environment. We are changing the basic biochemistry and the biology and physics of the planet at an ever-accelerating rate, and we are starting to lose the species. (**0025-111** [Johnston, Bill])

Comment: The storage of the radiation, that's an amazing amount of radiation that is already here, radioactive material that is already here. We're not even going to get to put it into Yucca; we're going to have to come up with another place. Think about this, people: this stuff is going to be here forever. (**0025-159** [Boxwell, Bob])

Comment: [E]ven if the proposed Yucca Mountain, Nevada waste dump were to open, and that seems increasingly unlikely, Calvert Cliffs 3 would not be eligible to put its waste there. So the high-level waste from this plant has nowhere to go until and unless the United States builds not the first one, which it has been trying to do for 30 years, but a second radioactive waste dump. (**0025-50** [Mariotte, Michael])

Comment: This EIS has to consider the very real possibility that the waste generated at this facility will stay on the shores of the Chesapeake Bay in perpetuity, and what are the environmental impacts of that. (**0025-51** [Mariotte, Michael])

Comment: [C]urrently, Calvert Cliffs is allowed to send its low-level waste to Barnwell, South Carolina for disposal. That ends this June. Barnwell is closing to outside waste. There are no plans to build a low-level waste facility to handle Maryland's waste. That means the low-level waste is going to have to stay onsite for the foreseeable future. The EIS has to look at the implications of 40, 60 years of generation of low level waste. Where is that going to go onsite? How is that going to be protected from the environment? (**0025-52** [Mariotte, Michael])

Comment: [E]very pound of high-level waste that is generated by Calvert Cliffs 3 will be excess to Yucca's capacity. (**0025-95** [Kamps, Kevin])

Comment: If you don't have an immediate solution to dealing with waste, then what makes you think one will be forthcoming in the future? (**0026-1** [Marsh, Rauni])

Comment: Additionally, our plant in AZ has to store those waste rods in cool water until such time, that it's our turn to dispose of them. Water, Cool water, here in the Blatant hot dry desert. (**0026-4** [Marsh, Rauni])

Response: *The NRC staff will evaluate the environmental impacts of the uranium fuel cycle including the impacts of fuel manufacturing, waste, transportation, and the onsite storage and eventual disposal of spent fuel. The results of this analysis will be presented in Chapter 6 of the EIS.*

15. Comments Concerning Transportation

Comment: The EIS should address possible effects of transportation of radioactive waste generated at the sites, in the unlikely event a waste repository ever will be built. This should include road, rail and barge transportation. (**0008-5** [Acevedo, NK] [Aitken, Keith] [Albright, Evan] [Andereson, David] [Arist, Phyllis] [Armas, Zoe] [Avance, Kenneth] [Bainum, Meghan] [Bakalian, Craig] [Baldwin, Natylie] [Barr, Phillip] [Bartholomew, Alice] [Becker, Rochelle] [Bedding, Gerhard] [Behabadi, Bardia] [Be, Maya] [Bissonnette, Rick] [Black, Monica Latka] [Blomstrom, Eric] [Borrowman, Ellen] [Briggs, Ruth] [Chinn, Jason] [Clark, Kevin] [Clark, Loralee] [Cleaver, Melissa] [Cox, Duncan] [Crawley, Jackie] [Crocca, Carol] [C, Suzy] [Culp, Richard] [Curington, Diana] [Daddy, Big] [Darbyshire, David] [DesHarnais, Gaston] [Diaz, Lorenzo] [Dolly, William] [Emmons, Cheryl] [Erdesohn, Cynthia] [Evans, Michael] [Faigle, Susan] [Fernow, Geoff] [Finnelli, Marilyn and Tom] [Fisher, Allison] [Foppe, Paul] [Fuller, Alfred] [Futterer, Joe] [Gannaway, Gloria] [Garbato, Kelly] [Garner, Patrick] [Gilpin, John] [Good, Riana] [Goodrich, Anne] [Grad, Robert] [Grand, Robert] [Grassi, Rosemarie] [Guay-Brezner, Colette] [Harberson, Laurie] [Hauck, Molly] [Hedlund, Cara] [Helvick, Steven] [Henderson, Sherry] [Hinton, Georgia] [Hoffman, Lilli] [Holzer, Frederick] [Hood, Marilyn] [Hooker, Betsy] [Huffman, Debbie] [Hughey, Patricia] [Hung, Shiu] [Hutchinson, Richard] [Jones-Giampalo, Mary] [Jones, Hollis] [Joos, Sandra] [Jula, Patty] [Kaliski, Raymond] [Kane, Donna] [Katz, Shari] [Klusman, Eric] [Knechel, David] [Kramer, Loren] [Kuintzle, Gaylene] [Lack, Robert] [Lallo, Patrick] [LaLumia, Anne Marie] [LaMonica, Francoise] [Latham, Rhonda] [LaVigne, Carole] [Lee, Angela] [Loew, Brenda] [Luczkowiak, Christopher] [MacNulty, Joy] [Magee, L] [Manske, Jill] [Marcus, Jack David] [Marks, John] [Marsh, Rauni] [Massey, Tom] [McArthur, Richard]

[McClure, Matthew] [McCoy, Timothy] [McKenna, Chris] [McKenna, Kathy] [McKenna, Lauren] [McKenna, Rick] [M, Crystal] [Metz, Richard] [Minault, Kent] [Miranda, Tina] [Moore, Kerry] [Mostov, Liz] [Munson, Clarence William] [Nagle, Thomas] [Nanfra, Freya] [Nash, James] [Nerode, Gregory] [Novick, Wesley] [Nunez, Albert] [Nunez, Carlos] [Oakes, Bonnie] [Olmstead, Harry] [O'Meara, Patrick] [Pacheco-Theard, Lauren] [Paquet, Kevin] [Parsons, Barry] [Paul, Georgia] [Pedraza-Tucker, Liette] [Petkiewicz, Margaret] [Phipps, Donald] [Piner, Lisa] [Piser, Daniel] [Putney, Louis] [Rader, Nancy] [Radford Jr., Roger] [Raines, Mary] [Ramstrom, Eric G and Shirley S] [Randall, David] [Rankin, Susan] [Reidenbach, Gregory] [Rosenblum, Stephen] [Ross, Anne] [Sather, Alice] [Sauer, Elizabeth] [Schmidt, Jason] [Schopp, Ricky] [Schwarz, Walter] [See, Bud] [Shafer, Scott] [Shashani, Linda] [Sherrow, Sarah] [Shively, Daniel] [Siecke, Martin] [Simila, Owen] [Skercevic, Maria] [Smith, Enoch] [Smith, Martha] [Snowden, Patricia] [Sorin, Susanna] [Soroos, Marvin S] [Soto, Yvonne] [Stevens, Denise] [Stilwell, Lisa] [Strange, Linda] [Theil, Tony] [Thiele, Abhaya] [Tornatore, James] [Trenholme, Art] [Turner, Tamisha] [Valliere, Cliff] [VanEtten, Margot] [Vieg, Jeannette] [Voeller, Estelle] [Wadkins, Melanie] [Waldman, Sam] [Walker-Meere, Susan] [Walsh, Donald] [Walters, Betty] [Wanner, Gabrielle] [Ward, John] [Welch, Irene] [Wilkins, Paul] [Willoughby, CaraLea] [Wilson, Deb] [Yeatts, Jordan] [Zastawecky, Margaret] [Zelikson, Linda])

Comment: The EIS must address the possible effects of transportation of radioactive waste generated at Calvert Cliffs, in the unlikely event a waste repository ever will be built. This should include road, rail and barge transportation on the Chesapeake Bay into the Port of Baltimore. (**0019-10** [Mariotte, Michael])

Comment: If barges are not used, then trucks or trains would be. The Baltimore train tunnel fire of 2001 could have killed thousands if high-level radioactive waste had been on board, and that route has been targeted by the Dept. of Energy in the past. DOE truck shipment routes criss-cross the State of Maryland. (**0019-12** [Mariotte, Michael])

Comment: I hope your process includes careful inspection of the dry cask irradiated fuel storage units at Calvert Cliffs as well as the problems involved in transporting this waste to another site. Have the casks degraded over time? How could such dangerous material be transported safely, avoiding densely populated areas -- which is where our rail lines and highways go -- without risk to the ecosystem of the Chesapeake Bay or the human population of the area? (**0020-6** [Donn, Marjory])

Comment: The transportation risks, again, are -- there are vulnerabilities to accidents and attacks. (**0025-100** [Kamps, Kevin])

Comment: And even if there are no accidents or attacks on these transportation containers, they are like mobile X-ray machines rolling down the railroad tracks, down the highways, in the Port of Baltimore, and there are certain people like pregnant women who should not be exposed to any radioactivity if it can be avoided. (**0025-102** [Kamps, Kevin])

Response: *The EIS will evaluate the radiological impacts of transporting fuel and waste to and from the proposed Calvert Cliffs Nuclear Power Plant (CCNPP) site. The impacts will be* *calculated for truck shipments of fuel and waste to and from the plant because the impact of truck shipping bounds the impacts of transporting these materials. The EIS will also include an analysis of the impacts of severe transportation accidents that could potentially occur along a spent fuel transportation route.*

Comment: A system of disposal is already in place for the existing two reactors at Calvert Cliffs. NAACPCCB [National Association for the Advancement of Colored People Calvert County Branch] is concerned about the existing disposal program especially in terms of transport of the waste out of the county, and the impact an accident could have on the community. In addition, a 3 rd reactor will create more waste, and more possibilities for accidents. NAACPCCB insists on the facility having a detailed plan outlining the disposal of all waste, and contingency plans in the event of accident. (**0017-2** [Brown, Jr., Edsel])

Comment: [A]nother accident scenario that folks around here need to worry about is the sinking of a barge on the Chesapeake Bay, because another proposal for removing these wastes from Calvert Cliffs is to barge them up to the Port of Baltimore. There's enough fissile material in the waste containers that, in the presence of water, if water were to infiltrate into a sunken container, a chain reaction could be initiated, and that would make emergency response a suicide mission at that point, because it would be giving off deadly doses of radioactivity. (**0025-101** [Kamps, Kevin])

Response: *A detailed analysis of the health and safety impacts of transporting fuel and waste by truck to and from the proposed Calvert Cliffs Nuclear Power Plant site will be conducted and included in Chapter 6 of the EIS. Emergency preparedness planning and preparations to respond to transportation accidents is described in detail in the "Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada" (DOE/EIS-0250F).*

Comment: [T]he EIS should evaluate the strength of transportation casks from tests conducted at the Sandia National Laboratory and consider the likelihood of a breach in any expected rail accident, including protracted fire and lengthy submersion. We suspect that the common opinion is that high-level waste would be shipped in containers resembling oil drums, and this is untrue. (**0025-63** [Meadow, Norm])

Comment: The EIS should evaluate the strength of transportation casks from tests conducted at the Sandia National Laboratory (http://www.sandia.gov/tp/SAFE_RAM/SEVERITY.HTM), and consider the likelihood of a breach in any expected rail accident, including protracted fire, and lengthy submersion. (**0028-37** [Meadow, Norman])

Comment: The MCC [Maryland Conservation Council] believes that the strength of transportation casks is sufficient to prevent releases of radioactive material in any conceivable transportation accident. (**0028-38** [Meadow, Norman])

Response: *The EIS will include an analysis of the radiological impacts of potential transportation accidents involving spent nuclear fuel [in Chapter 6]. Spent fuel is transported in massive, heavily-shielded shipping casks, referred to in 10 CFR Part 71 as Type B containers, and are designed to withstand severe transportation accident environments. The likelihood and consequences of shipping cask failures will be included in the transportation accident impact analysis in the EIS.*

16. Comments Concerning Cumulative Impacts

Comment: [W]hat are the implications of being 15 miles from a naval base? Does it work for us? Does it paint a particular bullseye? How does it weigh in, if at all? (**0024-109** [Buchanan, Bill])

Response: *The EIS will take into consideration other Federal projects in the vicinity, and any cumulative impacts of these projects will be assessed [in Chapter 7 of the EIS]. The concern about terrorism is an issue the NRC addresses separately and is out of the scope of this EIS.*

17. Comments Concerning the Need for Power

Comment: There is no end in sight to our rapidly expanding population - everywhere, not just in Calvert County - which means there is no end in sight for increasing energy demands. Alternative energy sources would be welcome but, so far, they are technologically inadequate to meet demand. (**0004-3** [Arndt, Gunter])

Comment: The EIS needs to ask the following question: Given the above, would not the per capita demand (kW hr per year, say) or the per household residential demand decrease at a rate equal to or exceeding the ca. 1% population growth rate? If the answer is yes, no additional power plants are needed, nuclear or otherwise. (**0005-20** [Vogt, Peter])

Comment: [T]he EIS needs to evaluate the likelihood that in the Mid-Atlantic grid area, per capita kWhrs/yr will level or has already leveled off. (**0005-21** [Vogt, Peter])

Comment: Initiatives taken by Maryland state government in 2007 aim to cut per capita electric consumption by 15% by the year 2015. Even if this goal is missed, what can easily be achieved can and probably will offset the 1% population growth rate. How close Maryland will come to reaching this goal cannot be evaluated/predicted just a year after the new measures were enacted. It is reasonable to expect that progress can be evaluated after 3 years, i.e. by 2010. (**0005-22** [Vogt, Peter])

Comment: Both Maryland and the nation are at a critical juncture. While conservation and energy efficiency will be important responses to increased electricity demand, and we support those efforts as does Constellation Energy and UniStar, conservation and energy efficiency will not offset the need for new base-load generation in Maryland or across the country. We need new energy generation and we need to reduce our dependence on foreign energy supply. (**0014-3** [Clark, Gerald] [Kelley, Linda] [Parran, Wilson] [Shaw, Susan] [Stinnett, Barbara])

Comment: I have long recognized the importance of nuclear energy in the electric power industry as a primary source for supplying our country's energy needs. The additional unit will positively contribute to the economic health of not only Calvert County, but the entire state of Maryland and the United States, through the availability of safe and affordable power. Expansion of the Calvert Cliffs, allows diversification of energy sources through the use of non polluting nuclear fuel. The additional unit will meet the increasing energy demands of the state of Maryland and the entire Mid-Atlantic Region. (**0015-2** [O'Donnell, Anthony])

Comment: The world is not going to fill its need for clean and environmentally friendly energy without pursuing all the many options available. Nuclear energy is emissions free when managed safely, less damaging to the environment and the technology is here today. We need to go forward with this project. It will be beneficial to my County and the Country by supplying needed energy and reducing our dependence on fossil fuel and all its damaging emissions. (**0016-3** [Zahniser, Albert])

Comment: [T]he construction of a third nuclear reactor at Calvert Cliffs would dramatically increase Maryland's energy self-sufficiency, nearly doubling the plant's present capacity and generating enough electricity to serve approximately 2.5 million homes, more than the total number of households projected for the State of Maryland in 2015. (**0023-3** [Hodge, Gary])

Comment: As technology advances, our economy and our population increases, so, too, will our need for energy grow. (**0024-21** [Kanaley, Mike])

Comment: Maryland is at a critical juncture in the availability of baseload generation, specifically the state's desire to generate enough reliable supply to reduce the import of energy to the state. (**0024-8** [Parran, Wilson])

Comment: Maryland is at a critical juncture in the availability of base load generation, specifically the state's desire to generate enough reliable supply to reduce the import of energy to the state. (**0025-10** [Parran, Wilson])

Comment: The U.S. Department of Energy estimates that our electricity demand will increase 25 percent by the year 2030. (**0025-118** [Walther, Robert])

Comment: As our technology advances, our economy expands, and our population increases, so, too, will our need for electricity grow. (**0025-119** [Walther, Robert])

Comment: According to the U.S. Department of Energy, the United States' demand for electricity will rise approximately 25 percent by 2030. That means our nation will need hundreds of new power plants to provide electricity for our homes and for our continued economic growth. (**0025-128** [Green, Bonnie])

Comment: I believe the power from this plant is absolutely necessary. I have read in the Baltimore and Washington newspapers that we may be looking forward to brownouts as early as 2011, because generation is not keeping up with the demand. (**0025-139** [Sinclair, Jim])

Comment: I think that by constantly focusing on how we need to increase supply, and not focusing on how we should be decreasing demand, is really putting the horse -- or the cart before the horse. (**0025-162** [Hunter, Theresa])

Comment: I believe that without the addition of the new generating facilities I personally believe that this will leave Maryland at a significant disadvantage. So, basically, we will be forced to import and pay more for electricity that's generated outside of the state. So I know that the environmental reports consider a variety of facts, and I just ask and encourage that you consider the electricity demand as part of your independent review. (**0025-166** [Pretto-Simmons, Nancy])

Comment: We do need electricity on the grid. (**0025-22** [Russell, Jack])

Comment: [B]usinesses, not only here in Calvert County and St. Mary's County, as it was just mentioned, but also to your neighbor to the north and more regionally, depend upon reliable energy sources to be able to conduct their businesses, and our consumers depend upon reliable energy sources. (**0025-32** [Burton, Bob])

Comment: [A]s a state, we have a critical energy supply problem. We need new energy generation, and we need to reduce our dependence on foreign energy supply. (**0025-7** [Parran, Wilson])

Comment: While energy efficiency and conservation are very desirable, the EIS must consider the rate of growth of the population in Maryland. These measures will perhaps only slow the rate of growth of demand. (**0025-74** [Meadow, Karen])

Comment: The PJM itself is estimating the need for a one and a half percent increase per year of summer production capacity over the next 15 years to meet demand. That means an increase of 25 percent of current capacity -- an amount that will be difficult to attain through energy efficiency and conservation alone, or even in concert with renewables. (**0025-75** [Meadow, Karen])

Comment: [W]hen you look at the stats and the figures from the State of Maryland, where privately we are being told, "Get ready, because by 2011 we'll have the rolling brownouts," in St. Mary's County we can't afford that. We are a growing community. Our energy needs are not going to decrease, and with conservation we might be able to keep them stable at the current levels. (**0025-83** [Scarafia, Bill])

Comment: We feel that it's critical to -- for growth in our region to have this additional supply on hand. We know it's down the road, but as our regions continue to grow we need to make sure that we have enough power to support key development in government agencies and other organizations that come to the State of Maryland and our region. (**0025-86** [Green, Joseph])

Comment: [T]he EIS must consider the projected rate of growth of demand for electricity which will be driven significantly by population growth as projected by the U.S. Census Bureau. (**0028-22** [Meadow, Norman])

Comment: Efficiency and conservation can only slow the rate of growth of energy need, they will not be able to reduce absolute demand. (**0028-23** [Meadow, Norman])

Comment: The PJM estimates a 1.5% increase per year of summer peak load capacity over the next 15 years to meet demand, resulting in a total increase of 25% of current capacity. Compared to the year 2000, the US Census Bureau estimates that Maryland's population will be 33% larger by 2030 and 260% larger by 2100. (**0028-24** [Meadow, Norman])

Comment: It is important to acknowledge that demand for electricity in our grid region is significantly higher in the summer as compared to the winter months (the next highest demand season of the year). (**0028-8** [Meadow, Norman])

Response: *These comments acknowledge or question the need for power based on an expanding population. The State of Maryland has examined the need for new electricity generation capacity in Maryland (Maryland Public Service Commission (MPSC). 2007. Electric Supply Adequacy Report of 2007. Online at: http://www.psc.state.md.us/psc/Reports/home.htm.) These studies will be reviewed in conjunction with preparing the need for power section [Chapter 8] in the EIS.*

18. Comments Concerning Alternatives - No Action

Comment: The EIS should fully and transparently consider alternatives to Calvert Cliffs-3, including ... the "no action" alternative. (**0019-5** [Mariotte, Michael])

Comment: Alternatives to this plant -- the EIS must consider alternatives to the plant, including the "no action" alternative. The EIS should very carefully look at whether and how Maryland's electric supply and its needs can be met through renewables, through energy efficiency, and the cost factors of those. I believe that a very strong case can be made -- and we'll be making that later this year to the Public Service Commission -- that Calvert Cliffs is the most expensive choice to meet Maryland's electric needs and they can be met much cheaper and much more cleanly through renewables and efficiency. (**0025-47** [Mariotte, Michael])

Response: *Alternatives to the proposed action, including siting alternatives, energy alternatives, and the no-action alternative, will be considered in Chapter 9 of the EIS.*

19. Comments Concerning Alternatives – Energy

Comment: Recent years have seen dramatic Improvements in appliance efficiency (e.g., refrigerators), insulation, light bulbs, etc., paralleled by rapidly decreasing cost of solar photovoltaics, (panel prices are declining at around 8% per year, largely due to reduced manufacturing costs caused by higher production volumes). Passive and PV solar, as well as ground source "geothermal", are very practical in the grid area served by the Calvert Cliffs Nuclear Power Plant. (**0005-19** [Vogt, Peter])

Comment: Most will agree that we have to arrest greenhouse gas emissions from fossil carbon fuels, because of likely widespread adverse impacts caused by resultant climate change. The mere fact that nuclear power greatly reduces C02 emissions does not by itself justify the US renaissance of nuclear power plants advocated by the nuclear industry/lobby and financially "greased' by EPACT. If nuclear were the only viable alternative to current C02-emitting coal-fired plants, most would agree we need more nuclear power plants. However, nuclear is absolutely not the only alternative, and is arguably the most risky and environmentally hazardous alternative. (**0005-23** [Vogt, Peter])

Comment: The EIS needs also to evaluate carbon sequestration (to offset C02 emissions from coal) and better scrubbing of other pollutants from coal, which the US has in abundance. Coal-fired plants are not inviting terrorist targets, there is no long-term waste issue, and many US jobs depend on coal mining, transport, and utilization. (**0005-25** [Vogt, Peter])

Comment: [I]t is safe to assume that nuclear fusion reactors will still not be operational even in the middle of this century (if ever). However, PV solar, ground-source geothermal, and solar passive air or water heating are not rocket science-- only the start-up investment and public inertia has slowed their acceptance. (**0005-26** [Vogt, Peter])

Comment: Recent trends in solar photovoltaic electric generation technology and pricing are dramatic. The EIS needs to extrapolate these trends not just to the time a potential third reactor would go on line (2015?) but for the probable lifetime of such a reactor (2075?). (**0005-27** [Vogt, Peter])

Comment: Solar power will never cover ALL our electricity needs, but will become a significant fraction of the total power mix. Solar, energy by itself is completely free and clean, and will be available for some billions of years! (**0005-29** [Vogt, Peter])

Comment: [W]e are lucky enough to be a coastal state. Nuclear reactors are extremely expensive - why can't we just build a great big wind farm out on the ocean like the one planned for Rehoboth, DE? (**0007-5** [Shannahan, Brittany])

Comment: The EIS should fully and transparently consider alternatives to Calvert Cliffs-3, including but not limited to:

- use of renewable energy to meet electricity demand and/or equivalent output of Calvert Cliff-3
- use of energy efficiency to reduce electricity demand to equivalent output of Calvert Cliffs-3, including various and aggressive energy efficiency program scenarios
- use of a combination of renewable energy and energy efficiency to meet electricity demand and obtain an equivalent output of Calvert Cliffs-3. (**0019-4** [Mariotte, Michael])

Comment: I hope the EIS will include in-depth consideration of alternatives to Calvert Cliffs –3. The area's power needs can be met by safer and more environmentally friendly means: through using renewable energy sources and by developing energy efficiency programs. (**0020-8** [Donn, Marjory])

Comment: Renewable energy sources will be valuable in diversifying the nation's energy supply, but their intermittent nature precludes their role as a reliable generation source. (**0024-10** [Parran, Wilson])

Comment: Conservation and more efficient electrical appliances help and a deeper commitment to renewable sources, such as wind, solar and geothermal, is needed, but conservation and renewable energy don't provide the baseload power we require to ensure the lights go on every time we flick a switch. (**0024-22** [Kanaley, Mike])

Comment: [I]t's our belief that through a combination of energy efficiency, clean renewables, like solar, wind, and geothermal, combined heat and power, and distributed generation, the state can meet its energy needs without investing a lot of money in a new nuclear power plant. (**0024-36** [Neumann, Johanna])

Comment: [I]f nuclear energy was the only way we could avoid climate change, global warming, then we'd have to weigh those risks, but there are alternatives, including wind power and solar energy and efficiency. (**0024-60** [Dubois, Gwen])

Comment: I would argue that there's reliable, fast, cheap, clean, safe, and more secure sources of electricity. Those would include efficiency and renewables. (**0024-80** [Kamps, Kevin])

Comment: Efficiency is seven times more cost effective dollar for dollar than nuclear power in reducing greenhouse gas emissions. So, given our limited resources and our limited time in addressing this crisis, we really have to go for the low-hanging fruit. (**0024-81** [Kamps, Kevin])

Comment: Nuclear is one of the most expensive and one of the most time-consuming ways to generate electricity, and I would like to commend Constellation Energy for its Super Bowl ad at the end of January where they showed wind power and the potential of wind power, but strangely enough, they didn't mention nuclear at all. So, I would call on Constellation to live up to its Super Bowl ad and pursue wind power. (**0024-82** [Kamps, Kevin])

Comment: Conservation and energy efficiency will be important responses to increased electricity demand and we support those efforts as does Constellation Energy and Unistar, but conservation and energy efficiency will not offset the need for new baseload generation in Maryland. (**0024-9** [Parran, Wilson])

Comment: [H]ow much of a reduction in peak energy demand do you think there would be if we went to smart metering? (**0025-109** [Johnston, Bill])

Comment: Conservation and energy efficiency will be important responses to increased electricity demand, and we support those efforts as does Constellation Energy and Unistar. But conservation and energy efficiency will not offset the need for new base load generation in Maryland. (**0025-11** [Parran, Wilson])

Comment: A single [solar energy] panel setup, 200 miles long, 200 miles wide, that square, would meet the energy demands for the United States in the year 2050. Coal burning uses more land than solar, once you take mining into account, that you are cutting off the mountain tops here and there, filling the ravines. (**0025-110** [Johnston, Bill])

Comment: Renewable energy sources will be valuable in diversifying the nation’s energy supply, but their intermittent nature precludes their role as a reliable generation source. (**0025-12** [Parran, Wilson])

Comment: [G]reater conservation and renewable energy don’t provide the round-the-clock base load power we require to ensure the lights go on any time we flip the switch. (**0025-120** [Walther, Robert])

Comment: I’m a great believer in renewables, such as wind power, and they should absolutely be part of the energy mix, but we can't rely on renewables alone. (**0025-140** [Sinclair, Jim])

Comment: I think we should avoid fossil fuel alternatives whenever possible. The effect of greenhouse gases on the environment is becoming very well documented. I truly believe the planet is in peril as a result of the use of fossil fuels. (**0025-141** [Sinclair, Jim])

Comment: [T]here is one group and one issue that I don’t think anybody has touched on, and that’s the new generation of power, and new technologies to generate power in the country is a national security issue. (**0025-145** [McGarvey, Sean])

Comment: It seems to me that one of the more important things that ... as a means by which we might help ourselves to become less dependent on any source of power generation, whether that be from nuclear or other sources, is through energy conservation and efficiency. (**0025-160** [Hunter, Theresa])

Comment: I think that it's through energy conservation and efficiency that we should be targeting our way forward to get to a point where we're able to support our region with the type of energy needs that we are going to need now and into the future, and not rely upon things such as an expansion of nuclear power. (**0025-161** [Hunter, Theresa])

Comment: When considering energy from wind, capacity factors should be documented by actual industry power production reports. For example, for wind installations in Pennsylvania, which are right next to where they want to put them in Maryland, and from the capacity value assigned by the PJM grid managers to the current wind installations, particularly for summer capacity when the demand is highest and the output is lowest. (**0025-65** [Meadow, Karen])

Comment: Environmental impact should include the actual land required for erecting those 4,800 turbines, plus the land required for the road system and the transmission lines. This land area would exceed 20,000 acres of cleared forest in the Appalachians, approximately 700 miles of ridge line, because they need to go on the ridge line to get the wind. (**0025-67** [Meadow, Karen])

Comment: [T]he EIS should examine the number of studies and their quality to measure bird and bat kills in the Appalachians, and should evaluate whether research done on wind installations in California, in a very different habitat, is applicable to the ecology of birds and bats in the Appalachians. (**0025-68** [Meadow, Karen])

Comment: Given that the wind installations proposed for western Maryland would be situated on major bird and bat migratory routes, the environmental impact of the turbines must be carefully considered. The habitat damage of the wind turbines far exceeds the actual cleared pads, since certain species of birds will not roost within 300 feet of a clearing. (**0025-69** [Meadow, Karen])

Comment: In regard to offshore wind, the EIS should evaluate the amount of research that has been done on the effects of noise and vibrations from the turbines on the ecology of the waters in which the turbines are placed. We are aware of only one brief study of something that could potentially cause extensive permanent damage to the ecology of these offshore waters, and that's wholly unacceptable. (**0025-70** [Meadow, Karen])

Comment: For bioenergy sources, such as with grass or short rotation forest crops, the amount of land required to replace the reactor's output should be investigated based on the known yield of these products. Land required for bioenergy crops would be approximately 6,000 square miles under cultivation. This is 60 percent of the State of Maryland. (**0025-71** [Meadow, Karen])

Comment: Photovoltaic power should be evaluated on the basis of capacity factors. Accordingly, in Maryland, it would require covering 100 square miles with very expensive solar panels, which is half the area of Calvert County. (**0025-72** [Meadow, Karen])

Comment: [W]e are living in a changing global warming environment, which may change the weather pattern, meaning alternatives to nuclear power that are based on weather, such as wind and sun, may well be ineffective in the years to come. (**0025-73** [Meadow, Karen])

Comment: I think if you insist on having nuclear power, and I insist there's very viable alternatives for anyone who is interested in looking into it, they should be located on the ocean where you get cooler water and higher operating efficiencies. (**0025-113** [Johnston, Bill])

Comment: There are cleaner forms of energy - solar for one, wind for another. Both are sustainable & with little or no public risk. (**0026-2** [Marsh, Rauni])

Comment: One mistake and we're all dead or worse. Nuclear power is not the answer! Sustainable natural energy from Nature is the only answer. (**0026-5** [Marsh, Rauni])

Comment: [N]uclear power must be compared to other methods for the generation of electricity on the basis of cost, reliability, and lack of carbon dioxide emissions, balanced against the potential for harm. (**0028-1** [Meadow, Norman])

Comment: Nuclear reactors work at approximately 90+% capacity year round. Calculated from the Capacity Values mentioned above, 5,500 2 MW wind turbines would be required to produce the same amount of electricity as the proposed reactor during the summer months when our region's demand is highest (and increasing most rapidly). (**0028-10** [Meadow, Norman])

Comment: Since nearly all commercial wind energy development is currently planned for the ridgetops along the Appalachian Mountain chain, and since the vast majority of these potential development sites are presently covered in dense forest, the impact resulting from construction of 5,500 huge wind turbines and their associated roads and transmission lines likely would result in the clearing of about 20,000 acres of forest along approximately 800 miles of ridge line. Wind energy facilities which have been built in the last 5 years in the PJM grid region have averaged about 3 to 5 acres of forest cleared per wind turbine, and they install on average about 7 or 8 wind turbines per mile of ridgeline. It should be noted that, in fact, there is not nearly enough suitably windy ridgetop in western Maryland to accommodate this intensity of wind energy development. (**0028-11** [Meadow, Norman])

Comment: Clearing 20,000 acres of forest releases a significant amount of carbon dioxide and eliminates a major carbon sequestration source, which has to be deducted from the environmental advantage of the wind installation. (**0028-12** [Meadow, Norman])

Comment: When investigating ecological damage caused by industrial wind installation, the NRC should examine the quality of the research done to measure bird and bat kills in the Appalachians and should evaluate whether research done on wind installations in CA is applicable to the ecology of birds and bats in the Appalachians. (**0028-13** [Meadow, Norman])

Comment: Given that the 20,000 acres of forest and ridgetop habitat in the mountains of Western MD and adjacent states likely would be needed to generate an equivalent amount of electricity from wind installations as compared to the single new reactor proposed to be added to Calvert Cliffs, and given that as many or more than 5,500 huge wind turbines therefore would be situated on major bird and bat migratory routes, the environmental impact of the wind energy alternative to this nuclear reactor must be carefully considered. (**0028-14** [Meadow, Norman])

Comment: The habitat damage of the wind turbines far exceeds the actual 20,000 acres cleared, since many forest interior dwelling species will not successfully persist or reproduce within at least 300 feet of a cleared edge, meaning that for the 700 mile length of the road and turbine clearings, an additional 300+ feet of forest interior habitat will be lost along each side of the road and turbine clearings' entire length. (**0028-15** [Meadow, Norman])

Comment: In regard to offshore wind, the EIS should evaluate the amount of research that's been done on the effects of noise from the turbines on the ecology of the waters in which the turbines are placed. ... The effects of the noise injected into the marine environment might not manifest themselves for several decades. (**0028-16** [Meadow, Norman])

Comment: About 1650 offshore turbines (3.5 MW using a summer Capacity Factor of 25%) would be required to equal the summer-time generating capacity of the proposed nuclear reactor. (**0028-17** [Meadow, Norman])

Comment: Bioenergy sources such as switch grass or short rotation forest crops are being proposed to fire steam boilers. The amount of land required to equal the proposed reactor's output should be investigated based on the known energy output and productivity for any crop being considered for firing stream boilers. Current average yields should be used, not unconfirmed projections of yield. (**0028-18** [Meadow, Norman])

Comment: Approximately 6,000 square miles of land would be required for the cultivation of either switch grass or short rotation forest crops. This is 60% of the State's land area and is equal to the area of all current forest and agricultural land. (**0028-19** [Meadow, Norman])

Comment: The EIS should investigate the energy required to dry these crops as we have been unable to determine if this has been considered by proponents of the method. (**0028-20** [Meadow, Norman])

Comment: Photovoltaic power's potential to provide electricity must be evaluated by using the Capacity Factor appropriate for Maryland, and not by nameplate capacity of the installations. The MCC estimates that it would require covering 100 square miles with solar panels (this is 1/2 the area of Calvert County) at a cost of $86 billion to equal the output of the single reactor. (**0028-21** [Meadow, Norman])

Comment: The damage to wildlife from small releases should be contrasted with the damage to habitat that would result from the construction of thousands of wind turbines, either on-or off-shore, or the conversion of thousands of square miles of farm and forest to bioenergy production which you will hear about shortly. (**0028-34** [Meadow, Norman])

Comment: [W]e believe that these renewables cannot provide a sufficient amount of electric power to significantly reduce dependence on coal. (**0028-4** [Meadow, Norman])

Comment: When considering energy from wind, the potential for electricity generation from commercial installations should be estimated from the annual and summer-time Capacity Factors documented by actual power production reports of existing facilities. (**0028-6** [Meadow, Norman])

Comment: [T]he Capacity Value (i.e., the capacity factor achieved during the 4-hour summer afternoon expected peak demand period -- following the methodology used by PJM's grid managers) ought to be used in evaluating the capability of wind energy or other renewable energy projects to substitute for this proposed nuclear reactor. (**0028-7** [Meadow, Norman])

Comment: Nameplate capacity provided by the manufacturers of wind turbines is misleading for estimating the wind generation potential which possibly could come from facilities located in western Maryland or elsewhere in the Mid-Atlantic Highlands region. (**0028-9** [Meadow, Norman])

Response: *The comments identify alternative energy sources, request that NRC consider [energy] alternatives [in] its analysis, or comment that certain alternatives cannot meet the power need. Alternative energy sources, including energy conservation and renewable energy sources, will be considered in [Chapter 9 of] the EIS.*

Comment: In carrying out the Environmental Impact Statement (EIS) scoping process related to Constellation Energy/Unistar's proposed Calvert Cliffs – 3 reactor, please consider alternatives to building the reactor. (**0020-1** [Donn, Marjory])

Response: *[Chapter 9 of the EIS will discuss the no-action alternative, alternative sites, alternative energy sources, and alternative plant systems.*

Comment: We believe that there are cleaner, safer, and more affordable alternatives [to nuclear power], so that Maryland can meet its energy challenges while moving forward with a clean energy economy and, you know, ultimately a much more environmentally sound and much more conscious of public health energy future. (**0024-34** [Neumann, Johanna])

Response: *The EIS will be prepared in accordance with 10 CFR 51.75(c). Alternative energy sources, including energy conservation and renewable energy sources, will be discussed in Chapter 9 of the EIS.*

20. Comments Concerning Benefit – Cost Balance

Comment: UniStar/Constellation Energy's Environmental Report lacks credibility and appears more intended at deflecting and deterring public involvement in the EIS than contributing to careful and transparent analysis. Specifically, the applicant's assertion (and the NRC's apparent acceptance of that assertion) that all financial information, including basic estimates of construction cost, are to remain proprietary makes any discussion of cost/benefit analysis impossible, and thus irrelevant, and leaves the EIS unable to fulfill one of its most basic obligations. (**0019-1** [Mariotte, Michael])

Comment: Even if the NRC staff has access to this allegedly proprietary information, and prepares a cost/benefit analysis based upon its access, the public still would not have the ability to assess this information, add a public perspective the NRC staff may be lacking, and comment upon this information—legal requirements of the EIS. (**0019-2** [Mariotte, Michael])

Response: *The applicant is entitled by 10 CFR 2.390 to have trade secrets and commercial and financial information held by the NRC as privileged or confidential, subject to certain procedural controls. The Commission also determines whether the right of the public to be fully apprised as to whether the bases for and effects of the proposed action outweighs the demonstrated concern for protection of a competitive position, and whether the information should be withheld from public disclosure. The NRC has determined that the requested financial information shall be held as confidential. The comparison of alternatives in the EIS is an environmental comparison; financial issues are addressed if an alternative site is determined to be environmentally preferable to the proposed site.*

Comment: Will nuclear power become a dinosaur by mid-century? If so, will it be too costly to dismantle such a plant (none of the size even of Calvert Cliffs Units I and 2 have ever been dismantled-this would cost billions of dollars). (**0005-28** [Vogt, Peter])

Comment: All of the sunken costs related to these construction activities, they should be included in the total capital cost of the project, especially when comparing the costs per kilowatt hour between nuclear and the alternative options. (**0025-91** [Fisher, Allison])

Comment: Erecting 5500 wind turbines in western Maryland will cost $22 billion, using a cost of $2 million per installed MW. (**0028-27** [Meadow, Norman])

Comment: [G]iven the wide range of cost estimates already reported by other U.S. utility projects (for example, Florida Power & Light testimony before the Florida Public Service Commission estimates construction costs for a single new nuclear unit running from $6 to $12 billion--a huge range), the EIS should not limit itself to a single cost figure, but rather must conduct its cost/benefit analysis on a range of foreseeable construction costs. (**0019-3** [Mariotte, Michael])

Comment: I think there are many reasons why this new reactor should not be built. One of these reasons is the cost. Constellation Energy says they expect it to cost around 4-5 billion dollars, but other estimates have ranged all the way up to a possible 12 billion. Then there's the cost of decommissioning it after the relatively short lifetime of a nuclear reactor. (**0020-3** [Donn, Marjory])

Comment: We will provide a cost-benefit analysis for the new nuclear power plant. It will use the current costs of nuclear power that you're seeing in the press today. (**0024-116** [Vanderheyden, George])

Comment: [W]e strongly feel that there should be a cost-benefit analysis as part of the environmental impact statement. You know, when Constellation was first embarking on this process, they were thinking the reactor might cost, you know, $2.5 to $3 billion. You know, new analyses coming out of Florida suggest that the cost may be as much as $12 billion. Those are significantly different figures and before we embark on that kind of plan, we need to make sure we know what we're getting into and so a cost-benefit analysis, looking at the tiered construction costs, should be part of this environmental impact statement. (**0024-37** [Neumann, Johanna])

Comment: Right now, Constellation is talking, I don't know, somewhere on the order of $4 billion a reactor, but -- and that may give you one set of conclusions about the costs and benefits of this facility. But if the reactor costs $8 billion, that might give you a different set of conclusions. And in that regard, that reactor in Finland, the only one that is being built with this design, is, after three years of construction, two years behind schedule and 50 percent over budget. That kind of thing has to be considered. (**0025-48** [Mariotte, Michael])

Comment: This month, two different utilities in Florida submitted documents to the Florida Public Service Commission estimating single reactor costs ranging from $6- to $12 billion per reactor. That's a big difference, and that is going to change the cost benefit analysis substantially, and this EIS should look at all of those different possibilities and not just accept this single cost for this facility. (**0025-49** [Mariotte, Michael])

Comment: Cost-benefit analysis should include the actual cost per installed watt of generating capacity of the turbines, as well as the cost of transmission lines, not the net cost after tax benefits, which are always talked about. This cost would be somewhere in the range of $16 billion as opposed to the $6- to $8 billion attributed to the new reactor. (**0025-66** [Meadow, Karen])

Comment: Just last December, over $20 billion was approved in nuclear loan guarantees for new reactors and for uranium enrichment in the United States. This is to an industry that profits at each reactor about a million dollars per day and has already enjoyed hundreds of billions of dollars in subsidies over the decades. (**0024-89** [Kamps, Kevin]

Comment: [T]he Price-Anderson Act has been renewed. That means that if there's a major accident at Calvert Cliffs, that it will be the U.S. taxpayers who bear the brunt of that accident in large part. (**0024-90** [Kamps, Kevin])

Comment: Cost benefit analysis should include the actual cost for the per installed watt of generating capacity as well as the cost of extensive length of transmission lines that will be required for highly decentralized sources of electric power such as wind and photovoltaics, not the net cost to the purchaser after government tax liability relief. Projections of reductions in cost should not be treated as assured. (**0028-26** [Meadow, Norman])

Comment: The property damages from that 1982 report were around $90 billion at each reactor if there's a major accident. So, if you adjust for inflation, double that amount of money, and again these were 1980 era population figures. So, you have to increase the casualty rates because the population has grown since then. (**0024-78** [Kamps, Kevin])

Response: *NRC regulations require a reactor license applicant to be financially qualified to engage in licensed activities. The staff will evaluate the applicant's financial qualification in its Safety Evaluation Report, not the EIS. However, the EIS will address the benefit-cost of the proposed action. The benefit-cost balance for the project will rely on the best available estimate of project timing and duration, with uncertainties noted where appropriate. Chapter 11 [now Chapter 10] of the EIS will discuss the estimated overall costs and environmental impacts of the proposed project.*

Appendix E

Draft Environmental Impact Statement Comments and Responses

Appendix E

Draft Environmental Impact Statement Comments and Responses

As part of the U.S. Nuclear Regulatory Commission's (NRC) review of the combined license (COL) application submitted by Constellation Generation Group, LLC and UniStar Nuclear Operating Services, LLC (collectively known as UniStar), NRC and the U.S. Army Corps of Engineers (Corps) (together referred to as the "review team") solicited comments from the public on the draft environmental impact statement (EIS), which was issued in April 2010. A 75-day comment period began on April 26, 2010, when the U.S. Environmental Protection Agency (EPA) issued a *Federal Register* Notice of Availability (75 FR 21625) of the draft EIS to allow members of the public to comment on the results of the environmental review.
As part of the process to solicit public comments, the review team:

- Placed a copy of the draft EIS at the Calvert Library, Prince Frederick Branch, and the Calvert Library, Southern Branch
- Made the draft EIS available in the NRC's Public Document Room in Rockville, Maryland
- Placed a copy of the draft EIS on the NRC website at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1936/
- Provided a copy of the draft EIS to any member of the public who requested one
- Sent copies of the draft EIS to certain Federal, State, Tribal, and local agencies
- Published a notice of availability of the draft EIS in the *Federal Register* on April 21, 2010 (75 FR 20867)
- Filed the draft EIS with the EPA
- Held two public meetings on May 25, 2010, in Solomons, Maryland.

Approximately 250 people attended the public meetings and numerous attendees provided oral comments. A certified court reporter recorded these oral comments and prepared written transcripts of the meeting. The transcripts of the public meetings were published on June 28, 2010, as part of the public meeting summary (NRC's Agencywide Documents Access and Management System [ADAMS] Accession Number ML101720321).

In addition to the comments received at the public meeting, the NRC received 18 letters and e-mail messages with comments. The comment letters, e-mail messages, and transcripts of the public meeting are available in ADAMS, which is accessible at http://www.nrc.gov/reading-rm.html. Individuals who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's Public Document Room reference staff at 1-800-397-4209 or 301-415-4737. The ADAMS accession numbers for the letters and e-mail messages are provided in Table E-1.

E.1 Disposition of Comments

Each set of comments from a given commenter was given a unique identifier, allowing each set of comments from a commenter to be traced back to the transcript, letter, or e-mail in which the comments were submitted.

After the comment period concluded, the review team considered and dispositioned all comments received. To identify each individual comment, the team reviewed the transcript of the public meeting and each letter and e-mail received related to the draft EIS. As part of the review, the review team identified statements that it believed were related to the proposed action and recorded the statements as comments. Each comment was assigned to a specific subject area, and similar comments were grouped together. Finally, responses were prepared for each comment or group of comments.

This appendix presents the comments and responses to them grouped by similar issues in the following order:

- Comments Concerning Process – COL
- Comments Concerning Process – National Environmental Policy Act (NEPA)
- Comments Concerning Site Layout and Design
- Comments Concerning Land Use – Site and Vicinity
- Comments Concerning Land Use – Transmission Lines
- Comments Concerning Meteorology and Air Quality
- Comments Concerning Geology
- Comments Concerning Hydrology – Surface Water
- Comments Concerning Hydrology – Groundwater
- Comments Concerning Ecology – Terrestrial
- Comments Concerning Ecology – Aquatic
- Comments Concerning Socioeconomics
- Comments Concerning Environmental Justice
- Comments Concerning Historic and Cultural Resources
- Comments Concerning Nonradiological Waste
- Comments Concerning Health – Nonradiological

- Comments Concerning Health – Radiological
- Comments Concerning Accidents – Design Basis
- Comments Concerning the Uranium Fuel Cycle
- Comments Concerning the Need for Power
- Comments Concerning Alternatives – Energy
- Comments Concerning Benefit-Cost Balance
- General Comments in Support of the Licensing Action
- General Comments in Support of the Licensing Process
- General Comments in Support of Nuclear Power
- General Comments in Support of the Existing Units
- General Comments in Opposition to the Licensing Action
- General Comments in Opposition to the Licensing Process
- General Comments in Opposition to Nuclear Power
- Comments Concerning Issues Outside Scope – Emergency Preparedness
- Comments Concerning Issues Outside Scope – NRC Oversight
- Comments Concerning Issues Outside Scope – Safety
- Comments Concerning Issues Outside Scope – Security and Terrorism
- General Editorial Comments.

When the comments resulted in a change in the text of the draft EIS, the corresponding response refers the reader to the appropriate section of the final EIS where the change was made. Throughout this final EIS, with the exception of this new appendix, revisions to the text from the draft EIS are indicated by vertical lines beside the text.

Table E-1 provides a list of commenters identified by name, affiliation (if given), comment number, and the source of the comment. Some comments addressed topics and issues that are not part of the environmental review for this proposed action. These comments included questions about the NRC's safety review, general statements of support or opposition to nuclear power, and comments on the NRC regulatory process in general. These comments are included in this appendix, however, detailed responses are not provided because the comments addressed issues that do not directly relate to the environmental effects of this proposed action and are thus outside the scope of the NEPA review of this proposed action. Many comments specifically addressed the scope of the environmental review, analyses, and issues contained in the draft EIS.

Table E-2 is an alphabetical index to the comment categories and lists the commenters and comment identification number(s) that were included in each category.

The balance of this document presents the comments with review team responses organized by topic category. References appear at the end of the appendix.

Table E-1. Individuals Providing Comments During the Comment Period

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID
Adams, Rod		Meeting Transcript (ML101610475)	0008
Allison, Kathleen		Meeting Transcript (ML101610475)	0008
Aschenbach, Ernie	Virginia Department of Game and Inland Fisheries	E-mail (ML101241198)	0001
Barber, Alonzo	Calvert County Economic Development Council	Letter (ML102000310)	0014
Bless, Melissa	Calvert County Tourism Advisory Commission	Meeting Transcript (ML101610452)	0007
Chambers, Bill	Calvert County Chamber of Commerce	Meeting Transcript (ML101610452)	0007
Chezik, Michael	U.S. Department of the Interior	Letter (ML102140110)	0016
Clark, Jerry	Tri-County Council for Southern Maryland	Meeting Transcript (ML101610475)	0008
Colosi, Peter	National Marine Fisheries Service, National Oceanic and Atmospheric Administration	Letter (ML102360364)	0017
Edwards, Donna	AFL/CIO	Meeting Transcript (ML101610452)	0007
Evans, Michael		Meeting Transcript (ML101610452)	0007
Fedders, Roy		Meeting Transcript (ML101610475)	0008
Fenwick, Bobby	Emergency Management and Safety, Calvert Dept. of Public Safety	Meeting Transcript (ML101610475)	0008
Fisher, Allison		Meeting Transcript (ML101610475)	0008
Fisher, John	Virginia Department of Environmental Quality	E-mail (ML101880707)	0005
Fleming, Richard	College of Southern Maryland	Meeting Transcript (ML101610475)	0008
Gibson, Greg	UniStar Nuclear Energy	Letter (ML101930026)	0004
Graham, Chuck	International Brotherhood of Electrical Workers	Meeting Transcript (ML101610475)	0008
Gray, Susan	Maryland Department of Natural Resources	E-mail (ML101880216)	0003

Table E-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID
Gray, Susan	Maryland Department of Natural Resources	Letter (ML101900427)	0003
Green, Bonnie	Patuxent Partnership	Meeting Transcript (ML101610475)	0008
Gunter, Paul	Beyond Nuclear	Meeting Transcript (ML101610452)	0007
Gunter, Paul	Beyond Nuclear	Meeting Transcript (ML101610475)	0008
Harris, Lora		Meeting Transcript (ML101610475)	0008
Hodge, Gary	Charles County Board of County Commissioners	Meeting Transcript (ML101610475)	0008
Irons, Ellie	Virginia Department of Environmental Quality	Letter (ML101970046)	0005
Jarmas, Ed	Calvert Cliffs 3 Nuclear Project	Meeting Transcript (ML101610475)	0008
Johnston, Bill		E-mail (ML101590299)	0002
Johnston, Bill	Self	Meeting Transcript (ML101610452)	0007
Kass, Leslie		Meeting Transcript (ML101610452)	0007
Kass, Leslie		Meeting Transcript (ML101610475)	0008
Kennedy, Sherri	Nuclear Energy Institute US Women in Nuclear, Constellation Energy Chapter	Meeting Transcript (ML101610452)	0007
Kilbourne, Hali		Meeting Transcript (ML101610475)	0008
Lamboley, Genny	Clean and Safe Energy Coalition (CASEnergy)	Meeting Transcript (ML101610452)	0007
Lamboley, Genny	Clean and Safe Energy Coalition (CASEnergy)	Meeting Transcript (ML101610475)	0008
Lutchenkov, Dimitri	UniStar Nuclear Energy	E-mail (ML101880217)	0004
Magerr, Kevin	U.S. Environmental Protection Agency, Region 3	E-mail (ML101940075)	0009
Mariotte, Michael	Nuclear Information and Resource Service for Chesapeake Safe Energy Coalition	Meeting Transcript (ML101610452)	0007

Table E-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID
Martin, Kendall	Iron Workers Local 5	Meeting Transcript (ML101610452)	0007
McClure, Kim		Meeting Transcript (ML101610475)	0008
Meadow, Karen	Maryland Conservation Council	Meeting Transcript (ML101610452)	0007
Meadow, Karen	Maryland Conservation Council	Meeting Transcript (ML101610475)	0008
Meadow, Norman	Maryland Conservation Council	E-mail (ML101900184)	0006
Meadow, Norman	Maryland Conservation Council	Meeting Transcript (ML101610452)	0007
Meraz, Christopher		Meeting Transcript (ML101610475)	0008
Navarro, Tony	Calvert Career Center	Meeting Transcript (ML101610452)	0007
Nickels, Tiffany		Meeting Transcript (ML101610475)	0008
O'Donnell, Anthony		Meeting Transcript (ML101610452)	0007
Parran, Wilson	Calvert County Board of County Commissioners	Meeting Transcript (ML101610452)	0007
Parran, Wilson	Calvert County Board of County Commissioners	Meeting Transcript (ML101610475)	0008
Peil, Cynthia		Meeting Transcript (ML101610475)	0008
Pennoyer, Gordon	Clean and Safe Energy Coalition, CASEnergy	Meeting Transcript (ML101610452)	0007
Pennoyer, Gordon	Clean and Safe Energy Coalition, CASEnergy	Meeting Transcript (ML101610475)	0008
Priddy, Bob	Self	Meeting Transcript (ML101610452)	0007
Robinson, Duncan	North American Young Generation of Nuclear	Meeting Transcript (ML101610475)	0008
Rogers, David	Calvert County Health Dept.	Meeting Transcript (ML101610475)	0008
Sevilla, June	Southern Maryland Citizens for Renewable Energy Solutions (CARES)	E-mail (ML101930022)	0010

Table E-1. (contd)

Commenter	Affiliation (if stated)	Comment Source and ADAMS Accession #	Correspondence ID
Sevilla, June	Southern Maryland Citizens for Renewable Energy Solutions (CARES)	E-mail (ML101930022)	0011
Sevilla, June	Southern Maryland Citizens for Renewable Energy Solutions (CARES)	E-mail (ML101950330)	0012
Sevilla, June	Southern Maryland Citizens for Renewable Energy Solutions (CARES)	Meeting Transcript (ML101610452)	0007
Simpson, Lauren	Solomns Business Assn.	Meeting Transcript (ML101610452)	0007
Spencer, Doris	Southern Maryland Consortium of African American Community Organizations	Meeting Transcript (ML101610475)	0008
Thomas, Richard	Calvert County Sheriff's Department	Meeting Transcript (ML101610475)	0008
Vaughn, Jackie	Calvert County Public Safety	Meeting Transcript (ML101610452)	0007
Wilson, Robert	Self	Meeting Transcript (ML101610452)	0007
Wolfley, Terri	Calvert County Economic Development Authority	Letter (ML102000309)	0015

Table E-2. Comment Categories

Comment Category	Commenter (Comment ID)
Accidents-Design Basis	• Fenwick, Bobby (0008-15-2)
Alternatives-Energy	• Allison, Kathleen (0008-21-9) • Fisher, Allison (0008-7-3) (0008-7-4) (0008-7-5) (0008-7-6) • Green, Bonnie (0008-17-5) • Johnston, Bill (0002-1-2) (0002-1-5) • Mariotte, Michael (0007-5-1) (0007-5-2) (0007-5-3) (0007-5-5) • Martin, Kendall (0007-23-6) • Meadow, Karen (0007-10-4) (0007-10-5) (0007-10-6) (0008-19-1) (0008-19-3) • Meadow, Norman (0006-1-3) (0006-1-4) (0006-1-5) (0006-1-6) • Meraz, Christopher (0008-14-2) (0008-14-3) • Peil, Cynthia (0008-24-3) • Robinson, Duncan (0008-23-4)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
Benefit-Cost Balance	• Kass, Leslie (0007-11-6) • Lamboley, Genny (0007-12-4) (0008-11-3) • Mariotte, Michael (0007-5-7) • Meadow, Karen (0008-19-2) • Meadow, Norman (0006-1-7) • Robinson, Duncan (0008-23-3)
Ecology-Aquatic	• Aschenbach, Ernie (0001-1-1) • Colosi, Peter (0017-1-1) • Fisher, John (0005-1-7) • Gibson, Greg (0004-1-2) (0004-1-3) • Gray, Susan (0003-1-29) (0003-1-31) (0003-1-32) • Harris, Lora (0008-28-1) (0008-28-2) (0008-28-6) • Irons, Ellie (0005-1-7) • Kilbourne, Hali (0008-26-1) • Lutchenkov, Dimitri (0004-1-2) (0004-1-3) • Magerr, Kevin (0009-1-4) (0009-1-11) (0009-1-14) (0009-1-15) (0009-1-16) (0009-1-30) • Sevilla, June (0007-6-7) (0007-6-8)
Ecology-Terrestrial	• Colosi, Peter (0017-1-3) • Fisher, John (0005-1-5) (0005-1-6) • Gibson, Greg (0004-1-7) (0004-1-8) (0004-1-9) (0004-1-10) (0004-1-12) (0004-1-14) (0004-1-16) • Gray, Susan (0003-1-15) (0003-1-16) (0003-1-17) (0003-1-18) (0003-1-20) (0003-1-21) (0003-1-22) (0003-1-23) (0003-1-30) • Harris, Lora (0008-28-3) (0008-28-7) • Irons, Ellie (0005-1-5) (0005-1-6) • Jarmas, Ed (0008-4-3) • Lutchenkov, Dimitri (0004-1-7) (0004-1-8) (0004-1-9) (0004-1-10) (0004-1-12) (0004-1-14) (0004-1-16) • Magerr, Kevin (0009-1-2) (0009-1-3) (0009-1-12) • Meadow, Karen (0007-10-3) • Pennoyer, Gordon (0007-18-9) (0008-12-5) (0008-12-10) • Robinson, Duncan (0008-23-5)
Editorial Comments	• Gibson, Greg (0004-1-15) • Gray, Susan (0003-1-19) • Lutchenkov, Dimitri (0004-1-15)
Environmental Justice	• Magerr, Kevin (0009-1-17) (0009-1-18) (0009-1-19) (0009-1-20) (0009-1-21) (0009-1-22) (0009-1-23) (0009-1-24)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
Geology	• Sevilla, June (0007-6-10) (0007-6-11) (0007-6-12) (0010-1-1) (0011-1-1) (0012-1-2) (0012-1-4) (0012-1-7) (0012-1-8) (0012-1-9)
Health-NonRadiological	• Sevilla, June (0007-6-13) (0012-1-19) • Wilson, Robert (0007-16-2)
Health-Radiological	• Adams, Rod (0008-27-2) • Fedders, Roy (0008-13-3) (0008-13-5) • Gray, Susan (0003-1-25) (0003-1-26) (0003-1-27) (0003-1-28) • Gunter, Paul (0008-10-1) (0008-10-2) (0008-10-3) (0008-10-4) (0008-10-5) (0008-10-6) • Johnston, Bill (0002-1-3) • Magerr, Kevin (0009-1-5) • Meadow, Norman (0006-1-2) (0007-9-3) (0007-9-4) (0007-9-5) (0007-9-6) (0007-9-7) • Rogers, David (0008-8-1) (0008-8-2) (0008-8-3) • Sevilla, June (0007-6-3) (0012-1-5) (0012-1-6) • Thomas, Richard (0008-18-1)
Historic and Cultural Resources	• Gibson, Greg (0004-1-17) • Jarmas, Ed (0008-4-4) • Lutchenkov, Dimitri (0004-1-17)
Hydrology-Groundwater	• Gray, Susan (0003-1-9) (0003-1-10) (0003-1-11) (0003-1-12) (0003-1-13) (0003-1-14) • Harris, Lora (0008-28-5) (0008-28-8) • Jarmas, Ed (0008-4-6) • Kennedy, Sherri (0007-22-7) • Magerr, Kevin (0009-1-8) (0009-1-10) • Martin, Kendall (0007-23-9) • Parran, Wilson (0008-1-2) • Peil, Cynthia (0008-24-5) • Pennoyer, Gordon (0007-18-7) (0008-12-8) • Sevilla, June (0007-6-4) (0007-6-5) (0007-6-6) (0012-1-11) (0012-1-12) (0012-1-13) (0012-1-14) (0012-1-15) (0012-1-17)
Hydrology-Surface Water	• Colosi, Peter (0017-1-2) • Fisher, John (0005-1-2) (0005-1-8) • Gibson, Greg (0004-1-6) • Harris, Lora (0008-28-9) • Irons, Ellie (0005-1-2) (0005-1-8) • Jarmas, Ed (0008-4-7) • Kennedy, Sherri (0007-22-6) • Lutchenkov, Dimitri (0004-1-6)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
	• Magerr, Kevin (0009-1-1) (0009-1-7) (0009-1-13) (0009-1-25) • Meraz, Christopher (0008-14-1) (0008-14-4) • Pennoyer, Gordon (0007-18-8) (0008-12-9) • Sevilla, June (0007-6-15)
Land Use-Site and Vicinity	• Gibson, Greg (0004-1-4) (0004-1-11) • Gray, Susan (0003-1-7) • Harris, Lora (0008-28-4) • Lutchenkov, Dimitri (0004-1-4) (0004-1-11) • Magerr, Kevin (0009-1-9)
Land Use-Transmission Lines	• Allison, Kathleen (0008-21-6) • Gibson, Greg (0004-1-1) • Lutchenkov, Dimitri (0004-1-1) • Pennoyer, Gordon (0007-18-10) (0008-12-11)
Meteorology and Air Quality	• Fisher, John (0005-1-3) (0005-1-9) • Gray, Susan (0003-1-1) (0003-1-3) (0003-1-4) (0003-1-24) • Irons, Ellie (0005-1-3) (0005-1-9) • Jarmas, Ed (0008-4-5) • Johnston, Bill (0007-13-3) • Kennedy, Sherri (0007-22-8) • Magerr, Kevin (0009-1-26) (0009-1-27) (0009-1-28) (0009-1-29) • Martin, Kendall (0007-23-8) • Parran, Wilson (0008-1-3) • Peil, Cynthia (0008-24-6) • Pennoyer, Gordon (0007-18-6) (0008-12-7) • Sevilla, June (0012-1-18)
Need for Power	• Clark, Jerry (0008-3-3) (0008-3-5) • Fisher, Allison (0008-7-2) • Graham, Chuck (0008-20-1) • Gray, Susan (0003-1-33) • Green, Bonnie (0008-17-3) • Hodge, Gary (0008-2-5) • Johnston, Bill (0007-13-5) • Kass, Leslie (0007-11-3) (0007-11-4) (0007-11-5) (0008-5-1) • Kennedy, Sherri (0007-22-2) • Lamboley, Genny (0007-12-1) • Mariotte, Michael (0007-5-4) (0007-5-6) • Parran, Wilson (0008-1-4) • Pennoyer, Gordon (0007-18-3) (0007-18-11) (0008-12-2) • Simpson, Lauren (0007-14-2)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
	• Wolfley, Terri (0015-1-4)
Nonradiological Waste	• Fisher, John (0005-1-4) • Irons, Ellie (0005-1-4)
Opposition-Licensing Action	• Peil, Cynthia (0008-24-1) (0008-24-9) • Sevilla, June (0007-6-14)
Opposition-Licensing Process	• Gunter, Paul (0007-8-2) • Johnston, Bill (0007-13-4)
Opposition-Nuclear Power	• Johnston, Bill (0007-13-1) • Peil, Cynthia (0008-24-2) (0008-24-4) (0008-24-7)
Outside Scope-Emergency Preparedness	• Fedders, Roy (0008-13-1) (0008-13-4) • Fenwick, Bobby (0008-15-1) • O'Donnell, Anthony (0007-1-6) • Vaughn, Jackie (0007-15-4)
Outside Scope-NRC Oversight	• Fedders, Roy (0008-13-6) • Gunter, Paul (0007-8-1) • Jarmas, Ed (0008-4-1) • Kass, Leslie (0008-5-3)
Outside Scope-Safety	• Allison, Kathleen (0008-21-5) • Evans, Michael (0007-7-2) • Fedders, Roy (0008-13-2) • Fenwick, Bobby (0008-15-3) • Jarmas, Ed (0008-4-9) • Kass, Leslie (0008-5-2) • Meadow, Norman (0007-9-8) • Sevilla, June (0007-6-9) (0012-1-3) • Wilson, Robert (0007-16-1)
Outside Scope-Security and Terrorism	• Allison, Kathleen (0008-21-7) • Sevilla, June (0007-6-1) • Vaughn, Jackie (0007-15-3)
Process-ESP-COL	• Gunter, Paul (0007-8-6) • Johnston, Bill ((0002-1-4) (0002-1-7) • Meadow, Karen (0007-10-2) • Parran, Wilson (0007-2-3) • Sevilla, June (0012-1-1) • Spencer, Doris (0008-6-4)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
Process-NEPA	• Chezik, Michael (0016-1-1) • Fisher, Allison (0008-7-1) • O'Donnell, Anthony (0007-1-2)
Site Layout and Design	• Gibson, Greg (0004-1-5) • Gray, Susan (0003-1-2) (0003-1-5) • Lutchenkov, Dimitri (0004-1-5) • Magerr, Kevin (0009-1-6) • Sevilla, June (0007-6-2) (0012-1-10) (0012-1-16)
Socioeconomics	• Barber, Alonzo (0014-1-4) • Bless, Melissa (0007-20-2) (0007-20-4) • Clark, Jerry (0008-3-6) • Edwards, Donna (0007-21-2) (0007-21-3) (0007-21-4) • Fleming, Richard (0008-22-1) (0008-22-2) (0008-22-3) • Gibson, Greg (0004-1-13) • Graham, Chuck (0008-20-2) • Gray, Susan (0003-1-6) (0003-1-8) • Hodge, Gary (0008-2-4) • Kennedy, Sherri (0007-22-3) • Lutchenkov, Dimitri (0004-1-13) • Martin, Kendall (0007-23-2) (0007-23-3) • Navarro, Tony (0007-4-1) (0007-4-2) (0007-4-3) • Nickels, Tiffany (0008-25-3) • O'Donnell, Anthony (0007-1-7) • Pennoyer, Gordon (0007-18-2) (0007-18-4) (0008-12-3) • Robinson, Duncan (0008-23-6) • Simpson, Lauren (0007-14-3) • Spencer, Doris (0008-6-2) • Vaughn, Jackie (0007-15-2) • Wilson, Robert (0007-16-3)
Support-Licensing Action	• Allison, Kathleen (0008-21-2) (0008-21-8) (0008-21-10) • Barber, Alonzo (0014-1-2) • Bless, Melissa (0007-20-1) (0007-20-5) • Chambers, Bill (0007-17-1) (0007-17-4) (0007-17-6) • Clark, Jerry (0008-3-1) (0008-3-2) (0008-3-4) • Edwards, Donna (0007-21-1) • Fisher, John (0005-1-1) • Green, Bonnie (0008-17-1) (0008-17-6) • Hodge, Gary (0008-2-1) (0008-2-3) (0008-2-7) • Irons, Ellie (0005-1-1) • Kass, Leslie (0007-11-1) (0007-11-7) (0008-5-5)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
	• Kennedy, Sherri (0007-22-9) • Martin, Kendall (0007-23-1) (0007-23-7) • McClure, Kim (0008-16-4) • Meadow, Norman (0006-1-1) (0007-9-1) • Meraz, Christopher (0008-14-5) • O'Donnell, Anthony (0007-1-1) (0007-1-3) (0007-1-4) (0007-1-9) • Parran, Wilson (0007-2-2) (0007-2-5) (0008-1-1) (0008-1-5) • Pennoyer, Gordon (0007-18-1) (0008-12-1) (0008-12-13) • Priddy, Bob (0007-19-2) • Robinson, Duncan (0008-23-7) • Thomas, Richard (0008-18-2) • Wilson, Robert (0007-16-5) • Wolfley, Terri (0015-1-5)
Support-Licensing Process	• Allison, Kathleen (0008-21-3) • Barber, Alonzo (0014-1-1) (0014-1-5) • Chambers, Bill (0007-17-3) • Clark, Jerry (0008-3-8) • Green, Bonnie (0008-17-2) • Hodge, Gary (0008-2-2) (0008-2-8) • Kass, Leslie (0007-11-2) • Martin, Kendall (0007-23-4) • Meadow, Norman (0007-9-2) • Parran, Wilson (0007-2-1) (0007-2-4) • Spencer, Doris (0008-6-1) • Vaughn, Jackie (0007-15-1) • Wolfley, Terri (0015-1-1)
Support-Nuclear Power	• Adams, Rod (0008-27-1) • Allison, Kathleen (0008-21-4) • Barber, Alonzo (0014-1-6) • Chambers, Bill (0007-17-5) • Green, Bonnie (0008-17-4) • Hodge, Gary (0008-2-6) • Kass, Leslie (0008-5-4) • Kennedy, Sherri (0007-22-1) • Lamboley, Genny (0007-12-2) (0007-12-3) (0007-12-5) (0008-11-1) (0008-11-2) (0008-11-4) • Martin, Kendall (0007-23-5) • McClure, Kim (0008-16-2) • Meadow, Karen (0007-10-1) • Meadow, Norman (0007-9-9) • O'Donnell, Anthony (0007-1-8)

Table E-2. (contd)

Comment Category	Commenter (Comment ID)
	• Pennoyer, Gordon (0007-18-12) (0008-12-12) • Robinson, Duncan (0008-23-1) • Wilson, Robert (0007-16-4)
Support-Units	• Allison, Kathleen (0008-21-1) • Barber, Alonzo (0014-1-3) • Bless, Melissa (0007-20-3) • Chambers, Bill (0007-17-2) (0007-17-7) • Clark, Jerry (0008-3-7) • Evans, Michael (0007-7-1) (0007-7-3) • Jarmas, Ed (0008-4-2) • Kennedy, Sherri (0007-22-4) • McClure, Kim (0008-16-1) (0008-16-3) • Nickels, Tiffany (0008-25-1) (0008-25-2) (0008-25-4) • O'Donnell, Anthony (0007-1-5) • Pennoyer, Gordon (0007-18-5) (0008-12-4) (0008-12-6) • Priddy, Bob (0007-19-1) • Robinson, Duncan (0008-23-2) • Simpson, Lauren (0007-14-1) • Wolfley, Terri (0015-1-2) (0015-1-3)
Uranium Fuel Cycle	• Fisher, Allison (0008-7-7) • Gunter, Paul (0007-8-3) (0007-8-4) (0007-8-5) • Johnston, Bill (0002-1-6) (0007-13-2) • Peil, Cynthia (0008-24-8) • Spencer, Doris (0008-6-3)

E.2 Comments and Responses

E.2.1 Comments Concerning Process – COL

Comment: We [the Maryland Conservation Council] appreciate the conclusion of the NRC staff that the reactor be approved. And we think that the analysis in the DEIS [draft environmental impact statement] is accurate and very thorough. (**0007-10-2** [Meadow, Karen])

Comment: [T]he [Calvert County Board of County] Commissioners understand the Nuclear Regulatory Commission's staff preliminary recommendation. The preliminary recommendation is that the combined operating license be issued as requested. We also understand that this recommendation is based on environmental reports submitted by UniStar and responses to requests for additional information, consultation with federal, state, tribal and local agencies, and the NRC staff independent review and consideration of comments received during the public scoping process. Finally, we understand that this recommendation is exclusive of the NRC staff evaluation of the site safety and emergency preparedness aspects that will be addressed in the NRC's final safety evaluation report to be published in July of 2012. (**0007-2-3** [Parran, Wilson])

Comment: Given the fact that we now have all of the information that we were seeking on behalf of our memberships, The [Southern Maryland] Consortium [of African American Community Organizations] truly supports this effort. We are in the process of reviewing the 800-odd pages in your report, and will be submitting written comments. (**0008-6-4** [Spencer, Doris])

Response: *These comments provide general information in support of the NRC review process for the COL. They do not provide any specific comments on the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Of great importance is that there has been no generic EIS on the surge of new nukes being proposed now ... so the broad issues have not been addressed, and will not if the EIS for each nuke is limited to each ROI being the respective state. That does not seem to provide the required cumulative evaluation required by NEPA (National Environmental Policy Act) to enhance public understanding of government decisions and participation therein. An NRC person after the meeting stated that it is not charged with defining US energy policy, in defending the ROI [Region of Interest] being limited to the Maryland. (**0002-1-4** [Johnston, Bill])

Response: *This comment addresses energy policy and cumulative environmental impacts relative to multiple applications for constructing and operating new nuclear facilities submitted to the NRC. The NRC's responsibility is to regulate the nuclear industry to protect the public health and safety within existing policy. The NRC is not involved in establishing or administering energy policy for the United States; that is the role of the Administration, the Congress, and the U.S. Department of Energy. Insofar as an applicant seeks to use radioactive material as a fuel source to provide electrical energy to address the needs of its service area, for example, over a specific period, it must obtain a permit, license, or authorization from the NRC. Before approving such a request and in preparing its EIS, the NRC does evaluate the environmental consequences of taking the action (i.e., issuance of a license to construct and operate an electrical generation facility that uses radioactive material as its fuel source). The NRC followed Council of Environmental Quality (CEQ) guidance (CEQ 1997) in establishing the region of interest relevant to cumulative impacts. In Chapter 7, the EIS considers the impacts of constructing, operating, and decommissioning the nuclear power plant in conjunction within the cumulative impacts analysis, which includes the other past, present, and reasonably foreseeable future activities. No change to the EIS was made as a result of this comment.*

Comment: [T]he application for CCNPP3 [Calvert Cliffs Nuclear Power Plant Unit 3] is out front ahead of all others in this wave of new nukes for the US. That is significant, but not at all mentioned in the public meeting. Is such context not relevant to public participation? We had to sit and listen for one hour of our three hour meeting to NRC and other government people each go through their boiler plate talks, and then each person who wanted to comment was limited to a few minutes. (**0002-1-7** [Johnston, Bill])

Response: *The NRC has an obligation to initiate the regulatory review of each application in a timely manner provided that the NRC staff finds the application to be technically sufficient and complete. The licensing process for COL applications is specified in Title 10 of the Code of Federal Regulations (CFR) Part 52. It is the policy of the NRC to keep the public informed and provide the opportunity to participate in the regulatory processes; the NRC has elected to provide the public with several different platforms to share its comments on the NRC's EIS. Conducting an "open house" and two public meetings in the site vicinity early in the public comment period is only one platform that is afforded to the public. The review team has an obligation to discuss the process for conducting the review and issuing the EIS to ensure that all members of the audience have the background and context to participate in a meaningful manner; even if some members of the public have not thoroughly reviewed the EIS at the time of the public meeting and plan to use the meeting to decide how to offer comments thereafter. The NRC collects comments on the draft EIS at the meeting for those who elect to submit oral comments at the public meetings; in addition, the NRC accepts written comments through a project e-mail address, by regular mail, or by fax for those who want to add to their oral comments as well as for others who choose to communicate with the NRC in written form. Participants may be requested to limit the length of their oral remarks to ensure that all who wish to speak at the public meetings will have the opportunity. Participants may submit comments of any length by e-mail, regular mail, or fax. No change to the EIS was made as a result of this comment.*

Comment: [I]t goes back to the whole issue that the cart has been placed before the horse. That it's my understanding that originally the idea was to package these certified and approved designs, and then plug that into the COL process. Now, when the agenda of the industry was not accommodated by this particular process, the rules were changed. And now we have this process that basically puts this production agenda on a conveyor belt that basically we think is now running hazardously in advance, dangerously in advance of the whole process. And of more concern, the risk that is taken by this action is to be borne out really with more concern on public health, safety and the environment. (**0007-8-6** [Gunter, Paul])

Response: *Title 10 of the Code of Federal Regulations Part 52, provides flexibility for a prospective applicant to decide how it would seek regulatory approval to construct and operate a nuclear power plant. Part 52 has several important features that can be addressed independently or in combination with each other. In promulgating Part 52, the NRC did consider public comments before finalizing the rule or amendments to the rule. One feature, 52.55(c), allows a COL applicant, at its own risk, to reference a design that is under review by the NRC but not yet certified. The U.S. EPR reactor design is one such design currently under review. However, a COL referencing a particular design cannot be issued by the NRC until the reactor design is certified by the NRC. Applicants select a reactor technology based on their own business criteria. If the U.S. EPR does not receive certification in the timeframe sought by the applicant, UniStar then would have to determine whether it would proceed with a different* *reactor technology. A change in reactor technology would need to be considered by the NRC to determine whether the change would be significant in terms of the environmental impacts of construction or operation. No change to the EIS was made as a result of this comment.*

Comment: There are many issues that impact the decisions drawn from DEIS. These issues which I am submitting [as separate comments] cover geological, water quality, air quality, desalination plant, and noise calculations as they affect our environment and public safety. Until these issues are adequately investigated and resolved, the DEIS for CC3 [Calvert Cliffs Unit 3] contains errors and omissions caused by the Applicant and the pressures exerted on gov't agencies to grant permits even if the scientific evidence and reports show otherwise. (**0012-1-1** [Sevilla, June])

Response: *These are general comments of concern on environmental and safety issues as a prelude to the commenter's intent to provide additional information. The NRC staff prepared this EIS in accordance with the requirements of NEPA, 10 CFR Part 52, and 10 CFR Part 51. In its review, the NRC staff and the Corps (review team) focused on the environmental effects of construction and operation of a new reactor. The team's review was based on information presented in the ER submitted by the applicant and information obtained from independent sources. Safety issues are not within the scope of the environmental review but are addressed in the separate NRC safety review. No change to the EIS was made as a result of this comment.*

E.2.2 Comments Concerning Process – NEPA

Comment: By law, specifically the National Environmental Policy Act [NEPA], the NRC is required to do a comparative analysis between the proposed action, in this case, the new reactor, and alternatives, i.e., energy efficiency, renewables and other fossil fuel-based generation. The purpose is to determine whether there's an alternative that has less of an adverse impact on the environment and its inhabitants. The requirement represents one of the most significant reasons for doing an environmental impact statement and should be done diligently, and with the objective of examining viable and environmentally sound ways to meet our energy needs. This is really the spirit of the NEPA policy. (**0008-7-1** [Fisher, Allison])

Response: *Chapter 9 of the EIS discusses environmental impacts of alternatives. Section 9.2.5 discusses the comparison of energy alternatives, Section 9.3.6 discusses the comparison of alternative sites to the proposed site and Section 9.4.5 summarizes the comparison of system design alternatives. No change to the EIS was made as a result of this comment.*

Comment: The technical details of the Draft EIS will of course stand on their own merits. This voluminous study ensures the public's best interests are given all due consideration, and that the environment's best interests are also maintained. As a state legislator, I've witnessed the NEPA EIS process as it relates to other areas of public interest and project proposals, and have full confidence in the fairness of efficacy of this process. My experience is that this process leaves no stone unturned. (**0007-1-2** [O'Donnell, Anthony])

Response: *This comment supports the NRC's implementation of the NEPA process. No change to the EIS was made as a result of this comment.*

Comment: The U.S. Department of the Interior has no comment on the Draft Generic Environmental Impact, NUREG-1936, for the Combined License for Calvert Cliffs Nuclear Power Plant, Unit 3, Calvert County, Maryland. We appreciate your early and continued coordination with our Bureaus.
(**0016-1-1** [Chezik, Michael])

Response: *This comment states that the U.S. Department of the Interior has no comments on the EIS. No change to the EIS was made as a result of this comment.*

E.2.3 Comments Concerning Site Layout and Design

Comment: Figure 3-1 that depicts Calvert Cliffs' site, the layout and the aquatic resource are not clearly marked. References to certain facilities in the chapter are not indicated in the figure (Camp Conoy, independent spent storage instillation). No compass orientation is provided. (**0009-1-6** [Magerr, Kevin])

Response: *EIS figures must balance the need to include a multitude of pertinent facilities or characteristics with legibility and size constraints. A compass rose was added to Figure 3-1 in the EIS to provide geographic orientation. Refer to Figures 2-10 and 2-12 of the EIS for the location of Camp Conoy. Refer to Figure 3-4 for the location of the independent spent fuel storage installation (ISFSI). Refer to Figure 2-7 for details on the Maryland portion of the Chesapeake Bay Watershed. Refer to numerous figures in Chapters 2 and 3, including Figures 2-1, 2-3, 2-4, 2-7, 2-8, 2-12, and 3-4, for additional details on the site layout and aquatic resources.*

Comment: Unit 3 is going to be a double reactor, never been built before. That's why it's still undergoing certification. And we've had a lot of problems with its design and relatives in Finland and other places. (**0007-6-2** [Sevilla, June])

Response: *The safety aspects of the proposed reactor are addressed in the applicant's Final Safety Analysis Report (FSAR) and the NRC staff's Safety Evaluation Report (SER). No change to the EIS was made as a result of this comment.*

Comment: Page 3-30. The project description indicates that a fifth, non-safety-related cooling tower would be constructed along with the four Essential Service Water System (ESWS) cooling towers. We understand that this is no longer part of UniStar's project design. (**0003-1-2** [Gray, Susan])

Comment: Section 3.4.2.2, Page 3-30, lines 1-11. The EPR design has 4 ESW cooling towers. The design does not include a 5th ESWS cooling tower. (**0004-1-5** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 3.4.2.2 of the EIS was modified to reflect these comments.*

Comment: The Applicant to date, has not presented sufficient details regarding the Desalination System, other than an initial study done several years ago which I located on the MD PSC [Maryland Public Service Commission] website when the Applicant applied for CPCN [Certificate of Public Convenience and Necessity] 9127. (**0012-1-10** [Sevilla, June])

Comment: So how can the DEIS address the public ground water resource has "no significant impact" ... when the Applicant's Desalination Plant documents are incomplete and that desalination will not be used until the 5th year of construction? (**0012-1-16** [Sevilla, June])

Response: *Desalination is a mature and reliable technology that has been used successfully at a variety of scales in the United States and internationally for decades. Desalination makes seawater suitable for industrial and potable purposes. The review team identified no issues that would limit the viability of desalination at the Calvert Cliffs site. The proposed desalination system would be integrated with the circulating water supply (CWS) intake and blowdown discharge system, thereby reducing the need for any separate intakes and discharges. Because the operation of the desalination system is dependent on these other systems, the review team determined that it would not be practical to have the desalination system operational prior to completing the installation of these other systems. In addition, given the SMALL impact that the review team determined would result from the incremental increase in groundwater use associated with the construction of proposed Unit 3, the review team determined that operation of the desalination system prior to operation of Unit 3 was not justified. No changes to the EIS were made as a result of these comments.*

Comment: Section 9.4. In the System Design Alternatives section of the DEIS, there is some confusion regarding the type of cooling system incorporated within the UniStar design. On page 9-161, the DEIS states that the proposed system is a mechanical draft cooling tower with plume abatement. However, UniStar's original cooling tower design study recommended a hybrid wet-dry mechanical cooling tower with plume abatement, and this is the description that the State used in its review documentation as part of the CPCN process. George Vanderheyden of UniStar confirmed the hybrid wet-dry design in his comments during the scoping process (see Appendix D of the DEIS, page D- 39, lines 6 and 16). The NRC should clarify this point with UniStar and revise the relevant portions of Sections 3 and 9 appropriately. (**0003-1-5** [Gray, Susan])

Response: *The cooling system design is described in Section 5.7.1. Plume abatement in UniStar's cooling system design is provided with a limited dry portion of the cooling tower. Plume-abated towers are a subset of hybrid wet-dry towers. The NRC staff limits the use of the term "hybrid wet-dry" to cooling towers with a more substantial portion of dry capacity than the limited dry capacity found in plume-abated towers. The dry portion of a plume-abated tower is focused on plume elimination, whereas, the NRC use of the term "hybrid wet-dry" focuses on systems in which the consumptive use of water by evaporation from the wet cooling towers is an issue and dry cooling is a substantial part of the system. No change to the EIS was made as a result of this comment.*

E.2.4 Comments Concerning Land Use – Site and Vicinity

Comment: [A]lthough I understand the permitting process does not have to abide by county regulations, a resistance to mitigating this loss seems like an affront to Calvert Cliffs local community, and here I am particularly speaking as a private citizen, and certainly stands in stark contrast to land preservation measures emphasized as a whole in the region. (**0008-28-4** [Harris, Lora])

Response: *The land use status of the Calvert Cliffs site is discussed in Section 2.2.1 of the EIS. This comment adds no new specific information, and no change was made to the EIS.*

Comment: Section 3.3.1.13, Page 3-27, line 2. Parking areas will be graded and "gravel". (not "paved") (**0004-1-4** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 3.3.1.13 of the EIS was modified to reflect this comment.*

Comment: Section 5.1.1, Page 5-2, lines 1-14. The John Smith Trail is a water trail and the information relative to project impacts is appropriate as the trail passes by the plant in the Chesapeake Bay. However, the other trail [Star Spangled Banner National Historic Trail] is new and the trail segments have not been defined. It has been described as a scenic driving tour which would in no way be impacted by the project's operation. Should a segment be defined that does pass by the plant in the Chesapeake, then the project impacts as described in the DEIS would be appropriate. (**0004-1-11** [Gibson, Greg] [Lutchenkov, Dimitri])

Comment: Page 4-6. The DEIS concludes that construction and operation of Calvert Cliffs Unit 3 (CCU3) would have a small impact on recreational resources, including the Captain John Smith National Historic Trail. While PPRP [Maryland Power Plant Research Program] does not necessarily disagree with the conclusion, it is difficult to determine the degree to which the trail would be affected in the absence of the National Park Service's (NPS) comprehensive management plan for the resource. This plan is currently under development and is scheduled to be released this year. During the State's CPCN [Certificate of Public Convenience and Necessity] evaluation process, NPS expressed concerns about proposed Unit 3 and we concluded that additional consultations between UniStar and NPS are necessary to ensure that the project's effects on the trail are understood and mitigated to the extent possible. This should be referenced in the DEIS as well. (**0003-1-7** [Gray, Susan])

Comment: Section 4.1, Land-Use Impacts, the DEIS mentions that small portions of the currently proposed Captain John Smith Chesapeake National Historic Trail and the Star-Spangled Banner National Trail would be converted from recreational land use to industrial land use. The DEIS should explain what these historic trails are and how the land use conversion would change their use (would this change disrupt trail activities?). It would also be helpful if this conversion could be quantified. (**0009-1-9** [Magerr, Kevin])

Response: *The Star Spangled Banner National Historic Trail is described on the National Park Service website as a combination of bikeways, byways, and waterways (NPS 2010). Planning* *for the trail is still ongoing. Similarly, plans and routes for the John Smith Chesapeake National Historic Trail have not been finalized. Sections 4.1.1, 5.1.1, and 7.1 of the EIS were revised to reflect that the trail routes have not been finalized. Because the routes are not yet final and because a trail route does not necessarily "… exist as a discernible trail" (NPS 2010), land conversion cannot be quantified at this time. The impact on recreational use would likely be negligible.*

E.2.5 Comments Concerning Land Use – Transmission Lines

Comment: I heard that someone testified today earlier, arguing that the site was not appropriate or suitable. In fact, the Unit 3 site is highly suitable for a new reactor, and in fact the EIS -- the draft EIS reaffirms this. The site already has transmission lines in place. We are not creating a new footprint. Plus, it [prevents] a drawn-out fight over acquiring new land for rights-of-way. It also has land currently available for building the actual reactor, and it has water access, as opposed to roads for transporting materials required during construction. (**0008-21-6** [Allison, Kathleen])

Comment: And, finally, I think it's worth noting that no new transmission corridors would be required to support Calvert Cliffs 3. (**0007-18-10** [Pennoyer, Gordon])

Comment: [N]o transmission corridors would be required to support Calvert Cliffs 3. No additional transmission corridors. (**0008-12-11** [Pennoyer, Gordon])

Response: *These comments support the discussion in Sections 2.2.2 and 4.1.2 and in Chapter 3 of the EIS. No change to the EIS was made as a result of these comments.*

Comment: Section 3.2.2.5, Page 3-11, lines 17-19. There is only one 500 kV transmission line in the South Circuit as explained in ER Section 3.7. (**0004-1-1** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 3.2.2.5 of the EIS was changed in response to this comment.*

E.2.6 Comments Concerning Meteorology and Air Quality

Comment: According to the [Virginia Department of Environmental Quality] Air Division, CCNPP is located in an ozone (O_3) maintenance area and an emission control area for the contributors to ozone pollution, which are volatile organic compounds (VOCs) and nitrogen oxides (NO_x). Therefore, all reasonable precautions should be undertaken to limit emissions of VOCs and NO_x, principally by controlling or limiting the burning of fossil fuels. (**0005-1-3** [Fisher, John] [Irons, Ellie])

Response: *The current air quality status of the site is described in Section 2.9.2 of the EIS. Air quality during construction and operation of the proposed Unit 3 is discussed in Sections 4.7 and 5.7.2. In addition, as stated in Section 4.7.3, the NRC will conduct a conformity determination under 40 CFR Part 93, Subpart B, outside of the NEPA process to determine whether additional mitigation is warranted. The Corps will make its determination regarding air conformity in the Record of Decision. No change to the EIS was made as a result of this comment.*

Comment: [The proposed facility] use[s] a hybrid cooling tower design that is much lower to the ground, less than 200 feet tall, versus a traditional natural draft cooling tower which is approximately 600 feet tall. The tower will also be equipped with a plume abatement system to virtually eliminate visible water plume from the tower. (**0007-18-6** [Pennoyer, Gordon])

Comment: Calvert Cliffs 3 will have a specifically designed cooling tower that minimizes the visible water vapor from the cooling tower. It's also a low cooling tower that's about 2,000 [sic - should be 200] feet versus the typical five to 600-foot cooling tower. (**0007-22-8** [Kennedy, Sherri])

Comment: [T]hey're using a hybrid cooling tower design that is much lower to the ground, only about 200 feet tall, versus the traditional natural draft cooling tower, which is approximately 600 feet tall. The tower will also be equipped with the plume abatement system to virtually eliminate visible plume from the tower. (**0008-12-7** [Pennoyer, Gordon])

Comment: [O]ur mitigation efforts during operation include using a hybrid cooling tower designed with a plume abatement system to minimize visible vapor plume, [and] the utilization of cooling tower drift eliminators that will reduce particulate matter emissions. (**0008-4-5** [Jarmas, Ed])

Response: *The proposed cooling tower structure is described in Section 3.2.2.2 of the EIS, and the impacts of cooling tower emissions during plant operation are discussed in Sections 5.7.1 and 5.7.2. The size of the cooling tower presented in these comments is consistent with the cooling tower design in the EIS. The NRC's designation of the cooling tower is a mechanical draft cooling tower with plume abatement. No changes to the EIS were made as a result of these comments.*

Comment: In Section 2.9.2 Air Quality the DEIS states that the NRC will comply with the requirements of the Clean Air Act (42 U.S.C. 7506) and air conformity regulation under 40 CFR 93.150 outside of the NEPA process. While such an approach is acceptable under the general conformity regulations, please be aware that the Limited Work Authorization Regulation (Final Rule 10/912007) does not preclude emissions from construction activities from inclusion in the air emissions inventory for determining applicability of conformity under 40 CFR 93.153, regardless of whether those emissions have a reasonable nexus to radiological health and safety and/or common defense and security. (**0009-1-26** [Magerr, Kevin])

Response: *The NRC staff notes that the EPA finds the approach of complying with the requirements of the Clean Air Act and conformity regulations outside the NEPA process acceptable. The issues raised by the remainder of the comment will be addressed in the context of the conformity determination. No change to the EIS was made as a result of this comment.*

Comment: The Hampton Roads Planning District Commission (HRPDC) does not believe that the proposed project would have a significant impact on air ... resources or jurisdictions in the Hampton Roads Region, based on the information presented in the EIS. (**0005-1-9** [Fisher, John] [Irons, Ellie])

Comment: Regulated [operational] emissions associated with the Calvert Cliffs 3 fall within state and federal guidelines and are in full compliance with National Ambient Air Quality Standards. (**0007-23-8** [Martin, Kendall])

Comment: Of course, air quality is also a concern to Calvert County, and the region, and during the public hearing process, questions were raised regarding potential air emissions from construction of Unit 3 and of subsequent operation. The [Calvert County] Board [of County Commissioners] was pleased to learn that the NRC believes that, based on regulated practices for managing air emissions, it is expected that emissions from operating Unit 3 would be minimal, and that no further mitigation would be warranted. And I'm referring to Section 5.7 of the document produced. (**0008-1-3** [Parran, Wilson])

Response: *These comments support the discussion in Sections 4.7 and 5.7 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Legislative guidelines which were enacted to protect the public are being negotiated away at the behest of and advantage of the Applicant. In the case of CC3 [Calvert Cliffs Unit 3], salinity of the Chesapeake Bay water was tested by the Applicant for the Desalination Plant and found to be 20 ppm [sic—should be parts per thousand], yet the salinity or Total Dissolved Solids (TDS) for computation of Air Quality for the Bay cooling water for the CWS Cooling Tower was negotiated by the Applicant to be less than actual (17.5 ppm [sic]). This lower salinity value is estimated as opposed to the actual test results, which allows the Applicant to obtain the necessary "numbers" to meet air quality calculations for PM [particulate matter] (especially PM2.5). This lower and estimated value affects Air Quality calculations and dispersion of air effluents because the amount of PM2.5 is under estimated. (**0012-1-18** [Sevilla, June])

Response: *The ER specifically states (e.g., Section 3.6.3.2 Table 3.6-2 and Section 5.3.3) that the water in the cooling water system would be maintained at approximately twice the salinity concentration of the water in Chesapeake Bay. The salinity used for estimating salt deposition is given in Section 5.3.3.1.1 as 17.50 milligrams per liter (approximately 17.5 parts per thousand [ppt]). The difference between 17.5 and 20 ppt salinity is not significant for the purposes of the action that the NRC is considering. No change to the EIS was made as a result of this comment.*

Comment: Page 3-30. The project description is inconsistent with DEIS Section 5.7, which describes the air quality impact analysis. Specifically, page 3-30 states that "Unit 3 would have six standby diesel generators and two Station Blackout diesel generators," when actually there will be 4 emergency diesel generators and 2 station blackout diesel generators, for a total of 6 units (as described on page 5-46 of the DEIS). (**0003-1-3** [Gray, Susan])

Response: *Section 3.4.2.4 of the EIS has been corrected to reflect this comment.*

Comment: Page 5-70. In the summary of operational impacts, specifically Section 5.10.3 summarizing air impacts, the text implies that diesel generators are the only stationary source of emissions during operation. In fact, the CWS cooling tower is a significant source of air emissions. (**0003-1-24** [Gray, Susan])

Response: *Section 5.10.3 of the EIS has been revised to include the CWS cooling tower as a source of criteria pollutants in addition to the intermittent emissions from the diesel generator.*

Comment: [T]he NRC team "froze" the UniStar application about the time of the State's original CPCN [Certificate of Public Convenience and Necessity] hearings (Maryland PSC Case No. 9127), and based its evaluation on the proposed facility configuration and planned equipment at that time. While this is understandable for the purposes of document production, it has resulted in NRC's project description being out of date in several areas ... In November 2009, UniStar submitted an application to modify the Calvert Cliffs Unit 3 (CCU3) project that was licensed in Case 9127. In the application, being handled via Maryland Public Service Commission (PSC) Case 9218, UniStar is proposing minor changes to the design of previously approved sources and the addition of two types of new minor air emission sources. This request for a modification to the CCU3 CPCN affects only air quality; there were no proposed changes to the project that affect water, wastewater, terrestrial, noise, or socioeconomic resources or impacts. (**0003-1-1** [Gray, Susan])

Comment: Pages 5-46 and 5-47. The list of regulated air emission sources and emission rates does not reflect the current design as we understand it. PPRP's [Maryland Power Plant Research Program] most current information regarding the relevant parameters is included as Attachment A to these comments. To avoid confusion on the part of individuals who may be reviewing both the NRC's and the State's evaluation, we would request that either (a) the final EIS be revised to reflect updated information, or (b) the final EIS include notations in appropriate parts of Sections 3, 4 and 5 to reflect the fact that some design parameters have changed. [Attachment A can be viewed by accessing ML101880216 through ADAMS] (**0003-1-4** [Gray, Susan])

Response: *The EIS has been updated to reflect the current air emission parameters as proposed by the applicant for Unit 3. The changes did not alter the review team's conclusions.*

Comment: In Section 7.6.2., Greenhouse Gas Emissions, the DEIS references a U.S. Global Change Research Program report evaluating the cumulative impacts of GHGs. Beyond mentioning the report, EPA recommends that the FEIS [final environmental impact statement] include a brief, qualitative summary of the potential impacts of climate change at global, national, and the relevant regional scale. (**0009-1-27** [Magerr, Kevin])

Response: *The U.S. Global Change Research Program (GCRP) (2009) report appropriately summarizes the results of research on potential climate change impacts on a global and national level; the GCRP Report provided information on a resource area as well as a regional basis. The EIS addresses the potential regional impacts of climate change, where appropriate, based on the significance of the action on the resource area. For example, Section 7.1 discusses the potential impacts of climate change on land use in the Calvert Cliffs region, and Section 7.3.2.2 discusses the potential impacts of climate change on estuarine habitats and fauna. In addition, Appendix L, "Carbon Dioxide Footprint Estimates for a 1000-MW(e) Reference Reactor," provides a more detailed and quantitative analysis of potential greenhouse gas (GHG) (CO_2-equivalent) emissions. No change to the EIS was made as a result of this comment.*

Comment: EPA also recommends that the discussion of mitigation in the FEIS analyze opportunities to reduce GHG emissions during construction and operation of the facility, e.g., through energy efficiency and/or use of renewable energy. (**0009-1-28** [Magerr, Kevin])

Response: *Sections 4.7.1, 4.7.2, and 5.7.2 of the EIS were modified to include more detail on the effect of mitigation measures that would reduce GHG emissions during construction and operation of the proposed facility.*

Comment: Finally, in Section 9.2.5, Summary Comparison of Energy Alternatives, NRC concludes that nuclear power results in significantly lower CO_2 emissions than coal or natural gas-fired generation. EPA recommends that the discussion also state that lower CO_2 emissions would result in lower climate change risks. See, e.g., CEQ's draft NEPA Guidance on Consideration of the Effects of Climate Change and GHGs (2/18/10) (GHG emission levels can serve as a reasonable proxy for climate change impacts). (**0009-1-29** [Magerr, Kevin])

Response: *The NRC remains vigilant of emerging environmental issues, regulatory approaches, and analytical methods that may inform its decisions. The review team relied heavily on the work of other Federal agencies, especially those with a direct mandate to address the science and the effects of climate change on public health and welfare; now that the U. S. Government position has crystallized, the review team believed that it was important to consider the new circumstances. As a starting point, on December 15, 2009, the Administrator of EPA issued her determination under her authority under the Clean Air Act that:*

> *… greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare…. The Administrator reached her determination by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change. (74 FR 66496)*

In addition to the finding, the bases for the finding provide insights on the extensive efforts within the Federal government to weigh and balance science and public policy issues when considering GHG emissions and the effects of climate change; GHG emissions are treated as a surrogate for the potential effects on climate. Several of the germane findings included:

> *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public health by evaluating the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food- and water-borne pathogens, and changes in aeroallergens.*
>
> *The Administrator has considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife.*
>
> *… with regard to government acceptance and approval of IPCC [Intergovernmental Panel on Climate Change] assessment reports, the GCRP Web site states that: ''When governments accept the IPCC reports and approve their Summary for Policymakers, they acknowledge the legitimacy of their scientific content.'' It is the Administrator's view that such review and acceptance by the U.S. Government lends further support for placing primary weight on these major assessments.*
>
> *EPA has no reason to believe that the assessment reports do not represent the best source material to determine the state of science and the consensus view of the world's scientific experts on the issues central to making an endangerment decision with respect to greenhouse gases. EPA also has no reason to believe that putting this significant body of work aside and attempting to develop a new and separate assessment would provide any better basis for making the endangerment decision, especially because any such new assessment by EPA would still have to give proper weight to these same consensus assessment reports.*

The latter represents an endorsement by the EPA of the GCRP (also known as the Karl Report). The Council on Environmental Quality (CEQ) draft guidance regarding climate change as an element of the NEPA review has been considered by the NRC staff in crafting its approach for developing EISs for new reactor applications. While it is important to disclose the comparison of GHG emissions among the proposed project and its alternatives, the conclusion that lower GHG (or CO_2-equivalent) emissions would result in lower climate change risks from this action is too broad a conclusion to state without more detailed analysis. A more detailed analysis to support such a conclusion was not warranted for this NEPA review. Appendix L presents the review team's estimate of the CO_2 footprint of the nuclear power generation alternative. The comparison of CO_2 footprints of nuclear power and alternatives is presented in Section 9.2.5. No change to the EIS was made as a result of this comment.

Comment: It will be 70 years in 2080 until we return the ozone to where it was in 1950. Seventy years to get back 60 years. (**0007-13-3** [Johnston, Bill])

Response: *This comment expresses concern about ozone. No change to the EIS was made as a result of this comment.*

Comment: Concerning the air pollution and possible land pollution from things that are in the air that eventually fall in the land, this is also a problem. We don't know its impact because it is not tested in a systematic fashion. (**0008-24-6** [Peil, Cynthia])

Response: *The review team's assessment regarding impacts to air quality during construction and operation of the proposed plant is presented in Sections 4.7 and 5.7.2 of the EIS. Table H-1 in Appendix H of the EIS lists Federal, State, regional, and local authorizations, permits, and certifications related to the COL for the proposed plant, including air quality permits. No change to the EIS was made as a result of this comment.*

E.2.7 Comments Concerning Geology

Comment: [T]his one here, the first one [scientific report] by Robert Grogan, Geology, it says, report in Investigation Number 12. This is 1970. In the EIS, the DEIS, I saw that they said that the folds do not appear on the cliff face. They do. Consult this one, and I can give you a copy of it. It's right here. It's a picture of Calvert Cliffs right very close to where the current power plant is. [Visual aids used by the commenter can be viewed by accessing ML101900608, ML101930022 and ML101950333 through ADAMS]. Now, the liquefaction they said has never occurred in Maryland. Dr. Peter Vogt has shown that liquefaction can occur even without an earthquake. As a matter of fact in the early '80s, and I gave this to Mr. Steckel and the NRC, Peter's report, that because of pipes freezing, the soil liquified - and that means it's like quicksand. And there's a lot of erosion in there. A lot of the words in the DEIS are saying that it is natural wave erosion. That's not true. As a matter of fact, recently I read in the New York Times that in Canada there was a house wherein the family died because all of a sudden the foundation under which the ground collapsed. Now, I know that they have done some studies on boreholes at where the power block is, but they have not tested the fault line which is a quarter mile from where the CWS cooling tower is going to be located. (**0007-6-10** [Sevilla, June])

Comment: You're building a nuclear power plant on a location where the soil is weak. And part of the problem there is the drainage patterns. Susan Kidwell who is a Ph.D. and who specifically said to UniStar's consultant, the patterns are not dendritic, meaning not root like. They are a pattern of straight stream segments. Which if you are a geologist, this is straight stream segments which are generally what they call tectonically controlled. Which means there's an earthquake possibility. And when you've got an earthquake fault running to the south side less than half a mile from where the CWS cooling tower is going to be located, that's not a very good location. (**0007-6-11** [Sevilla, June])

Comment: And I also have read some of the NRC documentation on the FSAR [Final Safety Analysis Report) that some of the tests are - they're not enough. And certainly there have been no tests done on this fault. Now, this dotted line in here, this is an upthrust that shows where the fault line would be. And these are streams that are right smack in - that are going to be affected at the Calvert Cliffs site. [Visual aids used by the commenter can be viewed by accessing ML101900608, ML101930022 and ML101950333 through ADAMS]. (**0007-6-12** [Sevilla, June])

Comment: Attached is Dr. Susan Kidwell's scientific analysis of CCNPP Unit 3's FSAR Rev 6, in form of letter to me, June Sevilla, since she is my subject matter expert witness. Dr. Kidwell's scientific review and analysis of the latest revision of FSAR impacts decisions made in the DEIS because the conclusions drawn by NRC Staff and the US Army Corps of Engineers were based on geologic and geotechnical information which have been misrepresented by the Applicant in their FSAR, which also contains errors and omissions that affect not only the FSAR, but the DEIS likewise. [Dr. Kidwell’s correspondence with June Sevilla is available at ML101900608.] (**0010-1-1** [Sevilla, June])

Comment: Dr. Kidwell's scientific review and analysis of the geological conditions at CCNPP as reflected in this Q&A and in her analysis of CC3 [Calvert Cliffs Unit 3] FSAR Rev 6, impacts decisions made in the DEIS because the conclusions drawn by NRC Staff and the US Army Corps of Engineers were based on geologic and geotechnical information which have been misrepresented by the Applicant in their FSAR, which also contains errors and omissions that affect not only the FSAR, but the DEIS likewise. [Dr. Kidwell’s answers to questions posed by the commenter are available by accessing ML101950333.] (**0011-1-1** [Sevilla, June])

Comment: The geological conditions in CCNPP property have been misrepresented by the Applicant in their FSAR and cover-ups have been discovered as apparent, by outside volunteer scientific sources. We are appealing to the NRC and to the USACE [U.S. Army Corps of Engineers] to take seriously this geologic condition and drainage by demanding that the Applicant conduct scientifically recommended steps (investigation and testing to determine the depth and direction of the Moran Landing Fault Line) so that appropriate actions may be taken to ensure the public safety and the safety of ground and surface water resources. (**0012-1-2** [Sevilla, June])

Comment: [T]he current version (Rev 6) of the CC3 FSAR that addresses these geological issues reflects the same unacceptable condition without additional investigation and appropriate testing. To my knowledge, the NRC has not required the Applicant, UniStar, to conduct the required bore hole and other tests to determine the depth and direction of the Moran Landing Fault Line, as recommended by Drs. Kidwell and Vogt. (**0012-1-4** [Sevilla, June])

Comment: How will CC3 supply electricity to the grid when the soil supporting the cooling water piping network and the CWS Cooling Tower, were to liquefy and damage the cooling water system because the soil was weak to begin with? Prevention of such catastrophic consequences are possible, if proper testing, validation, and other measures are undertaken regarding this undesirable and unsafe geological condition at the CCNPP site. (**0012-1-7** [Sevilla, June])

Comment: [I]t appears that the NRC has accepted the "armchair" analysis that the Applicant has presented in the FSAR and based on Dr Susan Kidwell's expert analysis of FSAR Rev 6 (which is part of this DEIS and FSAR submission), there is evidence that the Applicant has done a clever cover-up this geological condition that has far reaching effects both in public safety and environmental impacts covered in this DEIS. [Dr. Kidwell's analysis is available by accessing ML101900608, ML101930022 and ML101950333.] (**0012-1-8** [Sevilla, June])

Comment: The US Army Corps of Engineers relies upon facts and evidence presented by the Applicant and if the Applicant's input such as geologic conditions and drainage patterns are presented with errors and omissions, and in this case of CC3 [Calvert Cliffs Unit 3], a clever cover-up and misrepresentation of the scientific evidence (see Dr. Kidwell's expert scientific analysis included in this submission to NRC and USACE), then the conclusions made by USACE are based upon erroneous information, therefore cannot be relied upon to issue any permit without further investigation and review of the appropriate test results, after these investigations and testing have been conducted by the Applicant. [Dr. Kidwell's analysis is available by accessing ML101900608, ML1019300222 and ML101950333.] (**0012-1-9** [Sevilla, June])

Response: *This information is not new to the NRC staff; it has been under review by the NRC staff in developing the SER. However, these comments are out of scope with regard to the EIS. Geologic and seismologic impacts on the proposed Unit 3 facility are within scope of the NRC's safety-related review. These impacts are discussed by the applicant in Section 2.5 of its FSAR. The geologic and seismic information of the site is also being reviewed by the NRC staff, and the NRC staff's safety-related review and conclusions will be documented in SER Section 2.5.1. The potential for surface faulting, including the potential for surface deformation due to faulting, will be reviewed and documented in Section 2.5.3 of the SER. Dr. Kidwell's remarks and articles have been forwarded to the NRC safety branch for review. No changes were made to the EIS as a result of these comments.*

E.2.8 Comments Concerning Hydrology – Surface Water

Comment: Section 4.2, Page 4-7, lines 15-20. The list after Line 20 presents a number of water-related permits. NRC should consider including the Section 404 permit. This permit which is related to discharge of dredge material is discussed elsewhere, but could be listed here for completeness. (**0004-1-6** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 4.2 of the EIS was revised to include the Clean Water Act Section 404 Certification.*

Comment: [The Virginia Department of Environmental Quality] did not identify any impacts related to the proposed construction and operation of Unit 3 that would impact water quality and wetland programs administered by the agency. The DEQ Piedmont Regional Office (PRO) recommends that the NRC pursue the most environmentally protective alternative, taking into consideration existing state and federal water quality laws and regulations. (**0005-1-2** [Fisher, John] [Irons, Ellie])

Comment: The Hampton Roads Planning District Commission (HRPDC) does not believe that the proposed project would have a significant impact on ... water resources or jurisdictions in the Hampton Roads Region, based on the information presented in the EIS. (**0005-1-8** [Fisher, John] [Irons, Ellie])

Response: *These comments support the discussion in Chapter 4 and Chapter 5 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: [T]he water supply consumed from the Chesapeake Bay is - they say it's 3500 million gallons per day. That's actually 3.5 billion. It's one way of saying it's a little bit not that bad, but it's really bad. (**0007-6-15** [Sevilla, June])

Response: *Million gallons per day (MGD) is a standard unit describing the movement of water volume over a 24-hour period. The review team stated in the EIS that 3500 MGD are withdrawn for Calvert Cliffs Units 1 and 2. The review team also stated that essentially 100 percent of the water is returned to Chesapeake Bay. Only a small fraction of the returned water is consumed (i.e., evaporated) because of the temperature increase of the returned water. Unit 3 would withdraw an average of about 63 MGD, returning an average of about 30 MGD to Chesapeake Bay. No change to the EIS was made as a result of this comment.*

Comment: At a minimum, current conditions and future scenarios should be modeled using the latest version of the Chesapeake Bay watershed model. (**0008-28-9** [Harris, Lora])

Response: *The review team determined that the Chesapeake Bay Watershed Phase 5 Model would not enhance the Chesapeake Bay water quality impact assessment. The purpose of this model is to estimate nutrient loads in streams that drain into the bay as part of the process to meet Chesapeake Bay Total Maximum Daily Load (TMDL) levels being established by EPA. As stated in Section 2.3.3.1, Chesapeake Bay has excessive nutrient loading and low dissolved oxygen. The review team has a reliable estimate of the proposed facility's nutrient load and determined that it is negligible and would not detectably alter the water quality of the Chesapeake Bay. The nutrient load was estimated from the projected treated sanitary waste discharge (see Table 3.3-1 of UniStar's Environmental Report [ER]) and a conservative biochemical oxygen demand load from a secondary treatment facility of 50 mg/L. No change to the EIS was made as a result of this comment.*

Comment: Section 2.3.1.1, Surface-Water Hydrology, Figure 2-8 is unclear in identifying the surface water hydrologic features on the Calvert Cliffs site (tributaries and other water resources are not delineated or clearly marked making it difficult to assess the impacts to the resource). (**0009-1-1** [Magerr, Kevin])

Comment: Figure 3.4 is unreadable to determine drainage areas. The figure does not include the storm water management system. (**0009-1-7** [Magerr, Kevin])

Response: *EIS figures must balance the need to include a multitude of features with legibility and size constraints. The NRC currently does not publish EISs in color, making some figures difficult to view. The review team recommends examination of Figures 3.1-1 and 2.3-3 in*

UniStar's ER and Figure 2.4-11 in UniStar's FSAR for drainage areas. In addition, the Corps permit application public notice includes clear plans delineating wetlands and streams (USACE 2008). No changes to the EIS were made as a result of these comments. The Corps' permit decision, which will include a jurisdictional determination of waters of the United States, including wetlands, will be made following issuance of the final EIS.

Comment: EPA believes that deposition on impervious areas that drain to the headwater streams could cause higher TDS [Total Dissolved Solids] concentrated flows (both surface and shallow groundwater flow). EPA also recommends that those streams be monitored for TDS stress as well. (**0009-1-13** [Magerr, Kevin])

Response: *Pursuant to the Clean Water Act, EPA and the State of Maryland have authority to require water-quality monitoring for nonradiological material in the waters of the United States. The NRC has authority to place water monitoring requirements on any facility for radiological monitoring. A Water Quality Certification is a statutory requirement for a Corps permit decision. No change to the EIS was made as a result of this comment.*

Comment: Section 3.2.2.1 describes the intention of the stormwater management system to provide a safety function to keep locally intense precipitation from flooding safety related structures. It is unclear whether the stormwater management system is protective of water quality and the downstream channel ... EPA recommends that this be clarified in the FEIS. (**0009-1-25** [Magerr, Kevin])

Response: *Section 3.2.2.1 of the EIS was revised to de-emphasize the safety function of the stormwater management system. The stormwater management system, including site grading, drainage ditches, swales, and stormwater retention ponds for proposed Unit 3, are shown in quadrants 3:5E:H of Figure 3-4 of the EIS. The grading of the surface topography directs water into ditches that drain away from the site into creeks and stormwater basins.*

Comment: [UniStar has selected] a cooling system for Calvert 3 that would take in approximately 98 percent less water from the Chesapeake Bay than the existing Calvert Cliffs Unit 1 and 2. And to point out also, it is also further inland, about 1,000 feet from the shoreline. (**0007-18-8** [Pennoyer, Gordon])

Comment: UniStar has taken extra steps to ensure Calvert Cliffs Unit 3 has minimal environmental impact. They selected a cooling system for Calvert Cliffs 3 that would take in approximately 98 percent less water from the Chesapeake Bay than the existing two units at Calvert. (**0007-22-6** [Kennedy, Sherri])

Comment: [B]y selecting the cooling system for Calvert 3, they have selected a cooling system for Calvert 3 that would take approximately 98 percent less water from the Chesapeake Bay than the current existing facilities in Unit 1 and 2, and be further inland, about 1000 feet from the shoreline. (**0008-12-9** [Pennoyer, Gordon])

Comment: [T]he cooling system for Unit 3 would use approximately 98 percent less water than the current systems do for Unit 1 and Unit 2. We've reviewed that already. So, this means that we won't have to worry very much about having much of an impact on the Chesapeake Bay. (**0008-14-1** [Meraz, Christopher])

Comment: As far as the environmental impact statement goes, yes, there are effluent pipes discharging water into the Bay from nuclear plants such as Calvert Cliffs 1 and 2, but these are simply used to cool several nonradioactive plant processes and any contamination that can be found in them is generally undetectable once it goes out into the Bay, and certainly, far below any sort of limits that can be imposed by any state or federal regulations. (**0008-14-4** [Meraz, Christopher])

Comment: [O]ur mitigation efforts during operation include ... withdrawing significantly less cooling water from the Chesapeake Bay then once-through cooling systems employed in numerous nuclear facilities around the country. (**0008-4-7** [Jarmas, Ed])

Response: *These comments support the discussion in Chapter 3 and Chapter 5 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: With proposed displacement of headwater tributaries to Johns Creek, NMFS [National Marine Fisheries Service] has been particularly concerned about adverse hydrologic impacts associated with this project throughout the Johns Creek watershed. Consequently, we are strong supporters of the proposed use of regenerative stormwater management (RSM), a process for transferring surface water flow off the impervious surface to the shallow ground water system which feeds downstream base flow. This process is widely practiced in Maryland and in other areas. The applicant is proposing to implement this process within upper Johns Creek and its headwater tributaries, to minimize typical watershed impacts associated with deforestation and increased impervious surface. NMFS requests that our Annapolis Habitat Field Office receive updates on installation of RSM systems associated with this project, as well as monitoring results (including photographic evidence) on the success of these systems in protecting and/or enhancing the hydrologic integrity of the Johns Creek watershed. (**0017-1-2** [Colosi, Peter])

Response: *This comment supports the use of a particular approach to mitigate the alteration of the flows in Johns Creek watershed that would result from the changes in the site's surface and subsurface environment associated with the proposed Unit 3. The NRC or the National Marine Fisheries Service (NMFS) could request that UniStar brief the NMFS Annapolis Habitat Field Office on the development of stormwater management plans in consultation with other government agencies. No change to the EIS was made as a result of this comment.*

E.2.9 Comments Concerning Hydrology – Groundwater

Comment: [C]onstruction of a desalination plant [will] help eliminate the need to use area groundwater sources for this facility once it is operational. (**0007-18-7** [Pennoyer, Gordon])

Comment: As mentioned before, they're constructing a desalination plant to eliminate the need to use area groundwater sources for this facility once this plant is operational. This is yet another step that they've taken to avoid adverse impacts to our aquifer. (**0007-22-7** [Kennedy, Sherri])

Comment: We [the Calvert County Board of County Commissioners] were therefore pleased to learn of the findings in Section 5.10 of the draft EIS, that states, Based on the regulative practices for managing liquid discharges, the NRC review team expects that impacts to water from nonradioactive influence during the operation of proposed Unit 3, would be minimal and that no further mitigation would be warranted. Based on regional water supply concerns, we appreciate UniStar's decision to construct a desalination plant that will avoid the need to use groundwater and specific -- significantly decrease bay water use, ultimately reducing -- with ultimate resulting in 98 percent reduction in terms of the water use with the existing Unit 1 and Unit 2 today. (**0008-1-2** [Parran, Wilson])

Comment: [C]onstruction of a desalination plant will help eliminate the need to use area groundwater sources for the facility once it is up and running. (**0008-12-8** [Pennoyer, Gordon])

Comment: [O]ur mitigation efforts during operation include ... the construction of a desalination plant to eliminate the need to use area groundwater resources. (**0008-4-6** [Jarmas, Ed])

Comment: UniStar is constructing a desalination plant to eliminate the need to use area groundwater sources of the facility once the plant is operational, and a project cooling system which would take 98 percent less water from the Chesapeake Bay than the existing Calvert Cliffs Units 1 and 2. (**0007-23-9** [Martin, Kendall])

Response: *These comments support the discussion in Chapter 3 and Chapter 5 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Now, you put Calvert Cliffs Nuclear Power Plant as part of that, granted that they use a lot of Chesapeake Bay, the desalination plant for Unit 3, I still have to see something more concrete than a preliminary study done in like 2006, 2007. There was one paragraph devoted to it in the EIS and there's a lot of mention that we're going to have a desalination plant. We actually need the desalination plant now. And for UniStar to construct it just before they go into operation, I think, is a mortal sin. (**0007-6-5** [Sevilla, June])

Comment: We know ... that fresh water is a big issue always. We know that Calvert Cliffs 3 will use huge amounts of water from the same aquifer that people use for drinking water until the desalination plant is operational. From what I've seen and heard at previous meetings, the completion of that desalination plant doesn't seem to be on the same timetable as the beginning operation of the rest of the plant. We don't know what the environmental impact of these huge amounts of drinking water consumed by the plant would be, but we do know from tables presented in other places that the water in the aquifer is going down much faster than it should be, and that it can't be replaced as quickly by the natural processes. (**0008-24-5** [Peil, Cynthia])

Response: *The proposed desalination system would be integrated with the CWS intake and blowdown discharge system, thereby reducing the need for any separate intakes and discharges. Because the operation of the desalination system is dependent on these other* *systems, the review team determined that it would not be practical to have the desalination system operational prior to completing the installation of these other systems. In addition, given the SMALL impact that the review team determined would result from the incremental increase in groundwater use associated with the construction of Unit 3, the review team determined that operation of the desalination system prior to operation of Unit 3 would not be justified. No changes to the EIS were made as a result of these comments.*

Comment: Table 4-10. The water-related impacts section of the table states that UniStar must "comply with COMAR 26.17.06 for dewatering activities or obtain Water Appropriation and Use Permit, as needed." This statement is not correct. The Water Appropriation and Use permit is subsumed within the CPCN [Certificate of Public Convenience and Necessity] issued by the Maryland PSC [Public Service Commission]. Therefore, approval for dewatering was granted by the Maryland PSC when the CPCN was issued on June 26, 2009. The PSC license conditions pertaining to dewatering are Nos. 28 through 35. (**0003-1-10** [Gray, Susan])

Comment: Table 4-10. The water-related impacts section of the table includes the bullet "use offsite water supply." UniStar is only permitted to import fresh water to the site after it meets the requirements imposed by the Maryland PSC, with the exception of an emergency. Therefore, the statement should be revised to include "after the requirements set forth in Maryland CPCN Condition No. 38 have been met." (**0003-1-11** [Gray, Susan])

Comment: Section 4.2.2, p. 4-9, line 7. The DEIS states that PPRP [Maryland Power Plant Research Program] recommended that UniStar be granted an 8-year ground water appropriation to provide water for construction. This statement is outdated. The statement should be updated to indicate that the Maryland Public Service Commission (PSC) granted an 8-year appropriation to use ground water for construction as part of the issuance of the CPCN final order of June 26, 2009. (**0003-1-9** [Gray, Susan])

Comment: Section 5.2.2.2, p. 5-5, line 7. The statements regarding the proposed use of ground water from the Aquia aquifer as an alternative source upon unavailability of the desalination plant are not up to date. The CPCN issued by the Maryland PSC in Case 9127 required UniStar to conduct an alternatives analysis and submit the findings to MDE [Maryland Department of the Environment] for consideration within one year (CPCN Condition No. 16). UniStar submitted a draft report describing the alternatives analysis to MDE and PPRP on June 2, 2010. MDE and PPRP are reviewing the report to determine whether the requirements set forth in Condition 16 have been adequately addressed. (**0003-1-12** [Gray, Susan])

Response: *Sections 4.2.2., Table 4-10, and 5.2.2.2 of the EIS were modified to reflect the updated status of the Certificate of Public Convenience and Necessity (CPCN) final order regarding groundwater use.*

Comment: Section 7.2.2, p. 7-11, line 4. The EIS did not reference specific well hydrographs in support of statements regarding changing potentiometric surface in the Aquia aquifer. The nearest Aquia well hydrograph (Well CA Fd 54), with continuous recording, is at Calvert Cliffs State Park. The following link provides the trend since

2004. http://waterdata.usgs.gov/md/nwis/dv?cb_72020=on&format=gif_default&begin_date=2003-0621&end_date=2010-06-21&site_no=382407076260301&referred_module=sw. Additionally, a hydrograph for this well spanning the period 1978 to 2008 is shown on Figure 3-3 of PPRP's July 2008 Draft Environmental Review Document. The July 2008 ERD is available as part of Item #38 under Case 9127 or go to http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9100-9199\9127\Item_38\&CaseN=9127\Item_38. (**0003-1-13** [Gray, Susan])

Response: *Section 7.2.2 of the EIS was modified to provide this reference in support of the statements regarding trends in the potentiometric surface in the Aquia aquifer.*

Comment: Section 7.2.2, p. 7-11, lines 10-13. The DEIS states that MDE controls appropriations in excess of 10,000 gpd [gallons per day]. The reference to a quantity should be removed in the context of the sentence that refers to the 80% management level. MDE regulates new ground water withdrawals unless an exemption has been granted. Exemptions are eligible for uses up to 5,000 gpd, except for community water systems and if a use is in a water management strategy area. (**0003-1-14** [Gray, Susan])

Response: *Section 7.2.2 of the EIS was modified to reflect MDE's controls on groundwater withdrawals.*

Comment: The picking up of water, competing for our drinking water, my well could run dry tomorrow because of over-pumping. And to add to the increased demand from residential and commercial in the area is just too much. It's all concentrated in one location. (**0007-6-6** [Sevilla, June])

Comment: UniStar has systematically and incrementally increased their demand for ground water use and that UniStar would use water from the desalination plant during the 5th year of construction. John Grace, the Chief of the Source Protection and Appropriations Division, which is part of the Maryland Department of the Environment Water Management Administration (MDE WMA) has granted a six year extension to UniStar on their permit to draw water from the already oversubscribed Aquia aquifer (normal is 2 years). UniStar's piece meal process of increasing ground water drawdown and demands for inordinately long extensions on their permit is an excessive bending over backwards by gov't agencies for a merchant plant that is also asking for federal loan guarantees at taxpayer expense. (**0012-1-11** [Sevilla, June])

Comment: [O]ur residential wells could run dry for those of us who are at, or near sea level when we, the people, are competing with a privileged merchant plant like CCNPP Unit 3. The water demands of the residents and the current condition of the Aquia aquifer (low levels and continually decreasing, hence, also results in the high levels of arsenic) which I draw my potable well water supply is already oversubscribed TODAY; so how can the water quality and public potable water supply environmental impact be adequately assessed by the DEIS when UniStar's permit is still valid years from now and the water resources for the public are already low today and decreasing? (**0012-1-13** [Sevilla, June])

Comment: So how can the DEIS address the public ground water resource has "no significant impact" ... when a major water user such as CC3 [Calvert Cliffs Unit 3] is granted the amount and time latitude that it has been permitted even when the scientific reports already prove that the Aquia aquifer is already oversubscribed. (**0012-1-14** [Sevilla, June])

Comment: So how can the DEIS address the public ground water resource has "no significant impact" ... [when] the impact to water resources regarding CC3 permits span an inordinate amount of time into the future? (**0012-1-17** [Sevilla, June])

Response: *Assessments of groundwater use impacts from building and operating the proposed facility are in Sections 4.2.2.2 and 5.2.2.2 of the EIS. The review team concluded that the impacts on groundwater use would be SMALL for both building and operation. The Maryland Power Plant Research Program (PPRP) separately reviewed potential groundwater use impacts and reached a similar conclusion. No information was provided in these comments that would alter the review team's conclusion. No changes were made to the EIS as a result of these comments.*

Comment: [T]he well water from the Aquia aquifer in our community has been found to be high in arsenic. And in the wells in nine counties, those wells are also very high in arsenic for over-pumping. (**0007-6-4** [Sevilla, June])

Comment: Currently, there are already high levels of arsenic in the aquifer in 9 counties in Maryland (Coastal Western and Eastern shores), which has affected the water quality for the public water supply and the private residence wells of those residents like myself whose drinking and potable water supply comes from the Aquia. (**0012-1-12** [Sevilla, June])

Comment: So how can the DEIS address the public ground water resource has "no significant impact" ... [when] Units 1 and 2 already employ arsenic removal equipment at CCNPP premises and the wells for CC3 are also being equipped with heavy duty arsenic removal equipment? (**0012-1-15** [Sevilla, June])

Response: *Arsenic occurs naturally in groundwater. On January 22, 2001, the EPA adopted a new standard for arsenic in drinking water at 10 parts per billion (ppb), replacing the previous standard of 50 ppb (66 FR 6975). The rule became effective on February 22, 2002. This has meant that many water supplies that were within the standard in the past are no longer within the new standard and require treatment. Arsenic concentrations in several public water-supply systems in the Aquia and Piney Point aquifers in the Maryland Coastal Plain exceed 10 ppb. The review team identified no connection between these arsenic concentrations and the building and operation of the proposed facility. No changes to the EIS were made as a result of these comments.*

Comment: Section 4.2.2 Water Use Impacts, the loss of groundwater recharge to the surficial aquifer could have significant impact on water quality ... [in] the head waters tributaries and associated wetlands as well as to the base flow of John's Creek and related wetlands (it was reported that the base flow could drop as much as 50%). How are these impacts being minimized? (**0009-1-10** [Magerr, Kevin])

Response: *The State of Maryland has authority to regulate surface-water quality. UniStar's proposed stormwater management system as documented in its Stormwater Management Plan (Bechtel 2008, 2010) is protective of onsite waters. This system would capture some of the water and redirect it to Johns Creek, replacing the lost base flow to some degree. No change to the EIS was made as a result of this comment.*

Comment: Section 3.2.2.1 states the, "Pervious areas managed to reduce runoff and maintained free of vegetation would experience considerably higher recharge rates than adjacent areas with local vegetation." That statement could be true if the managed unvegetative areas are designed for infiltration and the soils are not compacted. In many cases these areas are compacted resulting in runoff rates similar to pavement. Further, vegetative areas provide a root system which assist in promoting greater infiltration. (**0009-1-8** [Magerr, Kevin])

Response: *If the soil were compacted, the recharge rate would likely decrease. The review team expects that some areas would be compacted either intentionally (mechanical compaction) or unintentionally (vehicles and laydown of heavy equipment). Other areas would be covered with gravel, which can enhance groundwater recharge. Some areas would be maintained vegetation free without compaction, which can increase recharge as stated in the EIS. The stormwater management plan provides features and procedures to limit any adverse impacts of areas made less pervious and, therefore, more likely to result in stormwater generation. Section 3.2.2.1 of the EIS was modified to clarify that different outcomes relative to groundwater recharge are possible in areas where vegetation has been removed, if the soil is compacted.*

Comment: I am assuming that the dewatering process of groundwater from the graded site, which may be comparable to hilltop mining, will include stringent controls and monitoring protocols to prevent contamination of Chesapeake Bay waters. (**0008-28-5** [Harris, Lora])

Comment: I highly recommend ... a more explicit description of groundwater dewatering impacts and monitoring protocols. (**0008-28-8** [Harris, Lora])

Response: *Pursuant to the Clean Water Act, EPA and the State of Maryland have authority to require water-quality monitoring for nonradiological material in the waters of the United States. The NRC has authority to place water monitoring requirements on any facility for radiological monitoring. A Water Quality Certification is a statutory requirement for a Corps permit decision. No changes to the EIS were made as a result of these comments.*

E.2.10 Comments Concerning Ecology – Terrestrial

Comment: [The Virginia Department of Conservation and Recreation] supports the following recommendations in the EIS:

- continued radiation exposure monitoring;
- use of the Site Resource Management Plan and Best Management Practices [to] protect resources;
- implementation of a Spill Prevention, Control and Countermeasures Plan; and
- continued coordination with the Maryland Department of Natural Resources for potential impacts to natural heritage species.

(**0005-1-5** [Fisher, John] [Irons, Ellie])

Comment: As an example of our mitigation efforts during construction, which are identified in the DEIS, we are creating and enhancing non-tidal wetlands, planting trees to reduce forest fragmentation, setting aside lands for conservation purposes, and removing invasive plants. (**0008-4-3** [Jarmas, Ed])

Response: *These comments support the terrestrial resource mitigation discussions in Section 4.3.1 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: One of the seemingly more important environmental impacts of the project is a loss of 12 acres of wetlands. (**0007-10-3** [Meadow, Karen])

Response: *Loss of wetlands, as discussed in Section 4.3.1.3 of the EIS, contributed to the MODERATE impact finding for combined construction and preconstruction activities stated in Section 4.3.1.5 and for cumulative impacts in Section 7.3.1.4 of the EIS. Additional wetlands are to be created or repaired to help offset this loss. No change to the EIS was made as a result of this comment.*

Comment: Page 2-34. The DEIS uses the scarlet tanager as a representative for Forest Interior Dwelling Species (FIDS) of birds, but does not indicate there are 24 other bird species designated as FIDS. (**0003-1-15** [Gray, Susan])

Response: *Within the EIS, the scarlet tanager (<u>Piranga olivacea</u>) is the lone representative for all 25 FIDS identified within the Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area (CAC 2000). Section 2.4.1.3 of the EIS was revised to clarify that the scarlet tanager represents 25 FIDS.*

Comment: Page 2-34. The description of the first type of FIDS habitat should indicate forested tracts at least 50 acres in size rather than 20.2 acres. (**0003-1-16** [Gray, Susan])

Response: *Section 2.4.1.3 of the EIS has been corrected to reflect this comment.*

Comment: Page 2-34. Although CAC [Maryland Critical Area Commission] 2000 does not state specifically that scarlet tanagers are declining in Maryland, the breeding bird atlas for Maryland does show a significant declining trend - see Atlas of the Breeding Birds of Maryland and the District of Columbia (1996) C. S. Robbins, Senior Editor. University of Pittsburgh Press. (**0003-1-17** [Gray, Susan])

Response: *Forest loss and fragmentation, believed to be the cause of FIDS population declines that include the scarlet tanager, are discussed in Sections 4.3 and 7.3.1 of the EIS. Forest fragmentation and loss factored into the MODERATE impact findings in both of these chapters. No change to the EIS was made as a result of this comment.*

Comment: Page 2-35. Figure 2-11 showing FIDS habitat in Calvert County, Maryland, should indicate the source of this data. (**0003-1-18** [Gray, Susan])

Response: *The caption of Figure 2-11 in the EIS was revised to provide the source of the depicted spatial data.*

Comment: Page 4-14. The sentence, "No area within CBCA [Chesapeake Bay Critical Area] limited development areas (LDAs) would be disturbed, and all temporary impacts would occur outside the CBCA," is misleading in that there are no LDAs designated in the project area. Within the Critical Area, the project would impact areas designated as Intensely Developed Area (IDA) and Resource Conservation Area (RCA). (**0003-1-20** [Gray, Susan])

Comment: Page 4-17. "There would be no disturbance in the LDA," is misleading in that there is no LDA designated in the project area. (**0003-1-21** [Gray, Susan])

Response: *The statement regarding disturbance in the LDAs in Section 4.3.1.1 of the EIS was incorrect and was deleted.*

Comment: Page 4-24. The statement, "Work activities within the CBCA are pending approval from the CBCA Commission, and mitigation may be warranted," should be updated to reflect that the Critical Area Commission has already granted approval of the project subject to a set of conditions. Critical Area Commission conditions are available as Item #80 under Case 9127 http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9100-9199\9127\Item_80\&CaseN=9127\Item_80. (**0003-1-22** [Gray, Susan])

Response: *Section 4.3.1.3 of the EIS was revised to include the approval by the Critical Area Commission and any associated conditions.*

Comment: Page 4-93. "To the extent practicable, design construction footprint to account for CBCA and other important habitat, including bald eagles nests," suggests that the project design has not concluded. The Critical Area Commission has reviewed what it considers to be the final project design. Any departure from this final project design that impacts the Critical Area would require further review by the [Critical Area] Commission. (**0003-1-23** [Gray, Susan])

Response: *Table 4-10 of the EIS was revised to reflect this comment.*

Comment: Today, at Calvert Cliffs 1 and 2, approximately 1800 of the existing sites' 2100 acres are currently dedicated natural habitat and are home to bald eagles, wild turkeys, fox, deer and two endangered species of tiger beetles, among others. (**0008-12-5** [Pennoyer, Gordon])

Comment: Calvert Cliffs has proven to be a good steward of the land that it currently has with over 1800 acres being a dedicated natural habitat for bald eagles, turkey, deer and foxes that thrive on the site. (**0008-23-5** [Robinson, Duncan])

Response: *These comments generally support the description of terrestrial resources provided in Section 2.4.1 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: [T]he proposed facility will be oriented on the site in a matter that minimizes its impact on the critical area, wetlands, flora and fauna. (**0007-18-9** [Pennoyer, Gordon])

Comment: [T]he proposed facility would be oriented on the site in a matter that minimizes its impact on the critical area of wetlands, flora and fauna. (**0008-12-10** [Pennoyer, Gordon])

Response: *These comments generally support conclusions about impacts to terrestrial resources provided in Section 4.3.1.1 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Section 4.3.1.1, Chesapeake Bay Critical Area (CBCA), it is reported that approximately 33.4 ac within the CBCA would be disturbed. It is unclear from Figure 4-2 where the proposed mitigation would take place. (**0009-1-2** [Magerr, Kevin])

Response: *The proposed mitigation would occur in the dark-shaded areas labeled Area 1, Area 2, and Area 3 in Figure 4-2 of the EIS. Section 4.3.1.1 of the EIS was revised to clarify locations of proposed mitigation in response to this comment.*

Comment: Section 4.3.1.3 identifies the extent of impacts to non-tidal wetlands of the Calvert Cliffs site. Table 4-3 along with narrative text groups the wetlands into nine Wetland Assessment Areas. These nine Wetland Assessment Areas should be identified in Figure 4.3 to clarify the impacts to these areas. (**0009-1-3** [Magerr, Kevin])

Response: *Existing figures could not be revised to show all nine wetland assessment areas in a legible manner. Complete maps of wetland areas I-IX described in Section 2.4.1.3 of the EIS can be found in the Final Wetland Delineation Report for Proposed UniStar Nuclear Project Area, Calvert Cliffs Nuclear Power Plant Site, Calvert County, Maryland (Tetra Tech NUS 2007). This document is available in ADAMS under Accession Number ML100040304. No change to the EIS was made as a result of this comment.*

Comment: While reported in the DEIS that the environmental impacts from Total Dissolved Solids (TDS) deposition from the cooling tower on vegetation would be negligible for both vegetation on site and in the vicinity, EPA recommends that a monitoring program be developed to monitor localized vegetation for the potential TDS stress. (**0009-1-12** [Magerr, Kevin])

Response: *Pursuant to the Clean Water Act, EPA and the State of Maryland have authority to require water-quality monitoring for nonradiological material in the waters of the United States. The NRC has authority to place water monitoring requirements on any facility for radiological monitoring. A Water Quality Certification is a statutory requirement for a Corps permit decision. No change to the EIS was made as a result of this comment.*

Comment: Section 4.3.1.3, Page 4-24 lines 33-35, and Page 4-25 lines 1-19. Both the state permit (Maryland Department of Natural Resources Wildlife and Heritage Service Endangered Species Permit Number 45135) and the federal permit (U.S. Fish and Wildlife Service Eagle Scientific Collecting Permit Number MB207511-0) are in place and include commensurate mitigation as required by governing agency. There is no condition in the permits related to the need for additional mitigation and, accordingly, no additional mitigation has been requested or needed by governing agencies. Furthermore, on April 5, 2010, the bald eagle was removed from Maryland's list of threatened and endangered species and, as such, does not require mitigation. The bald eagle was also removed from the federal endangered species list in August 2007. Removal from these official lists is a result of the tremendous recovery of this former endangered species. The bald eagle population is now fully recovered. Bald eagles are regularly seen throughout Maryland, especially near the Chesapeake Bay and its tidal rivers. (**0004-1-8** [Gibson, Greg] [Lutchenkov, Dimitri])

Comment: Section 4.3.1.3, Page 4-25, lines 10-13. The EIS should be changed to note that a 100 acre eagle conservation area has been negotiated and will be deeded accordingly. (**0004-1-9** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 4.3.1.3 of the EIS was revised to include updated information on permits required for removal of the bald eagle (Haliaeetus leucocephalus) nest, and to include the deeding of the eagle conservation area.*

Comment: Section 4.3.1.5, Page 4-34, lines 21-25. It is recommended that the EIS reflect that mitigation for most if not all terrestrial and aquatic impacts have been identified and agreed to including; tiger beetles, bald eagle, showy goldenrod, and wetlands. (**0004-1-10** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Mitigation actions have been negotiated and agreed upon concerning tiger beetles (Cicindelidae), bald eagles, and the showy goldenrod (Solidago speciosa). However, the Phase II nontidal wetland and stream mitigation plan is conceptual, and further mitigation measures for impacts to wetlands may be warranted. No change to the EIS was made as a result of this comment.*

Comment: Section 5.3.1.3, Page 5-12, lines 24-32. MDNR [Maryland Department of Natural Resources] concurred in writing on November 16, 2009, with UniStar's position that, per regulations, mitigation is not required. As such, concerns with discussions regarding establishment of showy goldenrod in transmission corridors would not be applicable. UniStar will update the COL, in a future revision, to reflect that relocation of showy goldenrod is not required per regulations and, as such, will not be implemented as part of the CC3 [Calvert Cliffs Unit 3] project. (**0004-1-12** [Gibson, Greg] [Lutchenkov, Dimitri])

Comment: Section 4.3.1.3, Page 4-21, lines 25-34 and Page 4-22, Lines 1-12. MDNR concurred in writing on November 16, 2009 with UniStar's position that, per regulations, mitigation is not required. As such, concerns with discussions regarding establishment of showy goldenrod in transmission corridors would not be applicable. UniStar will update the COL, in a future revision, to reflect that relocation of showy goldenrod is not required per regulations and, as such, will not be implemented as part of the CC3 project. (**0004-1-7** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *The establishment of showy goldenrod in transmission line corridors would occur naturally as transmission line corridors are maintained as open habitat that is preferred by this species and is not related to onsite mitigation. Because the showy goldenrod is a Maryland State Threatened species, the potential for impacts related to the preconstruction, construction, and operation of Unit 3 is discussed and disclosed in the EIS. Section 4.3.1.3 of the EIS was revised to reflect that no mitigation of showy goldenrod would occur.*

Comment: Section 7.3.1.3, Page 7-19, lines 22-34. MDNR concurred in writing on November 16, 2009, with UniStar's position that, per regulations, mitigation is not required. As such, concerns with discussions regarding establishment of showy goldenrod in transmission corridors would not be applicable. UniStar will update the COL, in a future revision, to reflect that relocation of showy goldenrod is not required per regulations and, as such, will not be implemented as part of the CC3 [Calvert Cliffs Unit 3] project. (**0004-1-14** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *The reference to proposed mitigation for the showy goldenrod was deleted from Section 7.3.1.3 of the EIS.*

Comment: Section 10.4.1.3, Page 10-15, lines 1-19. The subject eagle nest was not active in the 2009 season and was previously occupied by a young pair that would not necessarily have returned to this nest. In addition, both the state permit (Maryland Department of Natural Resources Wildlife and Heritage Service Endangered Species Permit Number 45135) and the federal permit (U.S. Fish and Wildlife Service Eagle Scientific Collecting Permit Number MB207511-0) are in place and include commensurate mitigation as required by governing agency. The federal permit is a nonlethal scientific take permit which includes a multi-year eagle habitat enhancement program intended to promote eagle productivity. As such, UniStar believes that the subject text should reflect these conditions. (**0004-1-16** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Although unoccupied in 2009, a bald eagle territory is considered active for 5 years after the last occupation. About 26 percent of active bald eagle nests were not occupied the following year in Virginia (Watts and Duerr 2010). Removal of an active eagle nest tree and subsequent construction activities within the territory would preclude any future occupation of this territory, whether from the previous pair or a new pair. Permits do not reduce lost productivity. Setting aside habitat around an active eagle territory may offset some of the loss* *of productivity, but this outcome is not yet known. Therefore, Section 10.4.1.3 of the EIS was not changed as a result of this comment.*

Comment: I work on Hall Creek in the upper part of the Bay in preparation for a fairly small state highway construction project and it's a requirement by MDE [Maryland Department of the Environment] that we establish baseline conditions. The land use changes associated with the construction process are enormous and will include the removal of several hundred acres of forest that not only provide habitat but also serve important ecosystem function in protecting receiving waters from high sediment and nutrient loadings. The clearing of this forest with no mitigation outside of the critical area is also in direct contradiction of Calvert County's comprehensive plan which calls for 100% replacement of forest area outside of the critical area and town centers. And this is also emphasized in the executive order for the Chesapeake Bay Region, that we attempt to conserve forest land as much as possible to mitigate nitrogen loadings to the Bay. (**0008-28-3** [Harris, Lora])

Response: *Clearing of forest and the offsetting mitigation measures are under the jurisdiction of the State of Maryland and, as it relates to wetlands, of the Corps. Forest loss is not part of NRC-authorized construction activities, and therefore, offsetting mitigation measures are not under the jurisdiction of the NRC. The Calvert Cliffs site is mapped as an industrial district within the Calvert County Comprehensive Plan. Industrial districts are "… intended to provide areas in the County that are suitable for light industrial uses free from other uses which might affect such development" (CCCP 2004). Although the Maryland Department of Natural Resources concluded that forest retained after construction would exceed thresholds defined in the Maryland Forest Conservation Act (Maryland Code Annotated Natural Resources 5-1601-1612) and would not require mitigation, loss of forest during the building of Unit 3 would not allow Calvert County to attain replacement of all forest developed outside the CBCA. Section 7.3.1.1 of the EIS was revised to reflect impacts from the building of Unit 3 on county-level conservation efforts as a result of this comment.*

Comment: I highly recommend ... mitigation of forest loss outside of the critical area. (**0008-28-7** [Harris, Lora])

Response: *The Maryland Department of Natural Resources concluded that forest retained after construction would exceed thresholds defined in the Maryland Forest Conservation Act and would not require mitigation. No change to the EIS was made as a result of this comment.*

Comment: Appendix K of the DEIS should be revised or supplemented for the FEIS with the latest version of the Conceptual Phase II Non-Tidal Wetland and Stream Mitigation Plan and any additional updates on the topic that come in before the due date of the Final EIS. (**0003-1-30** [Gray, Susan])

Response: *Appendix K of the EIS was updated to include UniStar's Phase II Mitigation Plan Summary of Nontidal Wetland, Streams, and Tidal Waters Impacts.*

Comment: [The Virginia Division of Natural Heritage] recommends that they be contacted at (804) 371-2708 for an update on natural heritage information in Virginia if a significant amount of time passes before the proposed Unit 3 is constructed since new and updated information is continually added to the Biotics Data System. [Biotics Data System output of Virginia natural heritage resources within a 50 mile radius of the proposed CCNPP3 site as of June 30, 2010, was supplied by the Virginia Division of Natural Heritage and can be viewed by accessing ML101880707 or ML101970046 through ADAMS]. (**0005-1-6** [Fisher, John] [Irons, Ellie])

Response: *The review team considered the information in the supplied table of natural heritage resources. Much of it focused on bald eagles. No additional species or areas of concern beyond those already discussed in the EIS were identified. If deemed appropriate, the NRC will contact the Virginia Division of Natural Heritage for future consultation regarding Calvert Cliffs Unit 3. No change to the EIS was made as a result of this comment.*

Comment: A significant portion of the proposed mitigation for nontidal wetland and stream impacts involves eradication of *Phragmites australis.* In consideration of the resistance of this species to control measures, the proposed control actions should be employed within designated areas in perpetuity, in order to better ensure success. Permanent common reed control measures that are the responsibility of the applicant should be required as special conditions in the authorized 404 permit for this project, with monitoring reports on success required up to 5-years following initiating of the enhancement action. (**0017-1-3** [Colosi, Peter])

Response: *The NRC has no statutory authority to require perpetual control of the common reed (Phragmites australis) as mitigation for nontidal wetland and stream impacts. The Corps has the statutory authority to require mitigation under the 404 permit. This comment was considered in the evaluation of the Phase II Mitigation Plan. A summaru of UniStar's Phase II Final Mitigation Plan for Wetlands, Streams, and Tidal Waters Impacts is included in Appendix K of this EIS. The 404 permit, if issued, will include special conditions addressing mitigation. The Corps' permit decision will be made following issuance of the final EIS.*

E.2.11 Comments Concerning Ecology – Aquatic

Comment: We [Virginia Department of Game and Inland Fisheries] reiterate our existing comments. "Based on the project's location within Maryland, our fisheries biologist did not indicate that the project would impact fisheries resources under our jurisdiction. If additional information regarding potential impacts to resources under our purview becomes available, please contact this office." (**0001-1-1** [Aschenbach, Ernie])

Comment: Due to the location of the project in the State of Maryland, [the Virginia Department of Game and Inland Fisheries] has no comments on the EIS. (**0005-1-7** [Fisher, John] [Irons, Ellie])

Response: *These comments state that the Virginia Department of Game and Inland Fisheries has no comments on the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Pages 2-90, 5-28, and 9-136. Will potential future control of zebra mussels or any other reasonably predicted invasive or nuisance species require application of additional control chemicals that have not yet been identified or assessed? (**0003-1-29** [Gray, Susan])

Response: *Zebra mussels (Dreissena polymorpha) are freshwater bivalves that do not tolerate salinities greater than about 5 parts per thousand (ppt) (Benson and Raikow 2010), which is much less than the lowest salinities that generally occur at the Calvert Cliffs site (about 11 ppt). The Asian clam (Corbicula fluminea) is another freshwater species that often colonizes power plant pipes. Asian clams also generally tolerate salinities as high as about 5 ppt, although they can withstand waters with salinities as high as 14 ppt for short time periods (Minchin 2008). Therefore, no need for control chemicals is anticipated because the salinity of the water near the Calvert Cliffs site is generally greater than the salinity tolerance for the zebra mussel and Asian clam. The UniStar ER, comments provided by others, and the NRC's research have not identified other estuarine invasive or nuisance species that might reasonably be predicted to require chemical controls by the proposed Unit 3. No change to the EIS was made as a result of this comment.*

Comment: Page 4-39. We expect the UniStar-suggested measures for reducing potential dredging impacts to be fully evaluated and implemented where appropriate as part of the Joint Evaluation and Permit process. Failure to be resolved in the DEIS should not constrain in any manner the addressing of these items in the Joint Permit Process. (**0003-1-31** [Gray, Susan])

Response: *Dredging impacts are evaluated in Section 4.3.2.1. In its ER, UniStar also suggested measures that hypothetically could reduce impacts. These are listed in Section 4.3.2.1 of the EIS. However, because they are not commitments, the review team did not rely on the suggested measures in the assessment of potential impacts nor the assignment of an impact level. The Corps of Engineers regulates work in waters of the United States, including jurisdictional wetlands. A permit decision will reflect consideration of whether the project could not be reconfigured or reduced in scope to further minimize or avoid adverse impacts to Waters of the U.S. The findings of this EIS would not constrain further negotiations among the Maryland Department of the Environment, the Corps, and UniStar on dredging impact reduction methods. No change to the EIS was made as a result of this comment. The Corps permit decision will be made following issuance of the final EIS.*

Comment: Pages 2-66, 5-11, F-44, 2-24, and 2-135. The proposed impact or disturbance to beach habitat for the project (and maintenance dredging) is very limited (see pages 2-66, 5-11 and F-44). However, the site does have beach habitat present to the south of the barge slip (2-24 and 2-135). We request that the environmental documentation include assessment of potential presence of horseshoe crabs, terrapins, and other significant tidal beach species (and/or those species reproducing on beach habitat). Measures or planning efforts for avoidance and minimization of impacts to beach habitats, if and as appropriate, should be assessed and described. (**0003-1-32** [Gray, Susan])

Response: *Sections 2.4.2.5, 4.3.2.2, and 5.3.2.1 of the EIS were revised to include the horseshoe crab (Limulus polyphemus) and diamondback terrapin (Malaclemys terrapin). The*

UniStar ER, comments provided by others, and NRC's independent review did not identify any additional significant tidal beach species that would be affected by the proposed project. UniStar has agreed to follow time-of-year restrictions (to protect tiger beetles) on activities to be conducted on the beach near the barge dock and near a small stream enhancement area south of the barge dock. Also, UniStar, as part of a condition on its CPCN, would restrict dredging the Bay bottom near the barge dock to appropriate times of the year, which would reduce potential impacts to beach habitats.

Comment: Section 3.3.1.4, Page 3-19, lines 15-17. At the current stage of construction planning, UniStar estimates that the intake structure will take 15 -18 months to construct. (**0004-1-2** [Gibson, Greg] [Lutchenkov, Dimitri])

Comment: Section 3.3.1.7, Page 3-25, line 22. At the current stage of construction planning, UniStar estimates that the barge dock area will take approximately 6 months to refurbish. (**0004-1-3** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Sections 3.3.1.4 and 3.3.1.7 of the EIS were revised to update the construction timeline.*

Comment: Now, the desalination plant, I haven't seen anything on the entrainment of aquatic where there's billions of eggs that's being entrained right now in Calvert Cliffs 1 and 2. So, I haven't seen the study of how much entrainment will be attributed to the desalination plant which they would need, and they need now. (**0007-6-7** [Sevilla, June])

Response: *Water for the desalination plant would be taken from the water withdrawn for the Unit 3 cooling water system. The entrainment estimates presented in Sections 5.3.2.1 and 5.3.2.3 for the cooling water system include any entrainment in support of the desalination plant. No change to the EIS was made as a result of this comment.*

Comment: So, our community here, we've got a lot of fishermen and we do recreational fishing. A lot of people flock to Maryland because of the Chesapeake Bay. And nuclear power plants are the worst offenders in entrainment, because entrainment means they're a hundred percent dead. In total, there's 10 billion per year or 9,924,434,995 of bay anchovy, Atlantic menhaden, croaker, spot, white perch, weakfish, river herring and American eel die because they are caught in the water intake structure. Okay. Now, I haven't seen that, again, in the desalination plant. That's just a small portion of it. And that's per year. So, when you start doing that year after year, how much are you going to have left in the bay for the fish? And this is not even considering shellfish. There's a table in the EIS, Table 5-2, which tells you just how much this is. (**0007-6-8** [Sevilla, June])

Response: *The question of cumulative effects of entrainment by CCNPP Units 1 and 2 and proposed Unit 3 is addressed in Section 7.3.2.2. Research cited in the EIS found that entrainment by CCNPP Units 1 and 2 has not significantly affected aquatic resources in Chesapeake Bay. The NRC concluded that the additional entrainment by the intake system for proposed Unit 3, which would withdraw less than 2 percent of the volume of water withdrawn by the existing units, would not add significantly to entrainment impacts. The EIS also referenced a* *chapter in the Chesapeake Bay Fisheries Ecosystem Plan (McBride 2006) that expressed concern that bay anchovy (Anchoa mitchilli) populations may be adversely affected by the cumulative entrainment by all power plants and that the incremental entrainment by proposed Unit 3 would add to the total. The NRC evaluation considered the potential effects of entrainment (and impingement) on shellfish such as blue crabs (Callinectes sapidus) and oysters (Crassostrea virginica) (Section 5.3.2.3). Neither shellfish species has been documented in entrainment samples collected at CCNPP Units 1 and 2. Blue crabs are impinged on the intake system screens but have a very high survival rate (more than 99 percent). The NRC considered the potential cumulative impacts of entrainment as an important component of its overall cumulative impact assessment for the mesohaline portion of Chesapeake Bay. No change to the EIS was made as a result of this comment.*

Comment: Calvert County has highly-erodible soils and it is likely that some of the BMPs [Best Management Pratices] put in place will fail at some point during the construction project. And, in fact, the DEIS does address this by saying that they will have a daily monitoring person on site to look at the BMPs. I would strongly recommend that that person be from the soil conservation district who worked with the Calvert Cliffs to design the BMP itself. The damage caused by failed BMPs and changes incurred by the altered stream geomorphology are not included as conditions that should be monitored. I find this very surprising, given the monitoring requirements that even small restoration and mitigation projects will now undergo with the new executive order. (**0008-28-2** [Harris, Lora])

Response: *UniStar must meet requirements and conditions set by the State of Maryland and Calvert County in its site preparation and building activities to minimize impacts. Section 4.3.2.4 in the EIS describes UniStar's basic construction monitoring plan as part of the stormwater pollution prevention plan. In that plan, UniStar proposed regular (daily and after major rainstorms) monitoring of stormwater discharges and the conditions of the engineered erosion control measures. The State of Maryland and Calvert County may require monitoring for compliance with their respective State and local permits, if issued. No change to the EIS was made as a result of this comment.*

Comment: [O]ne thing ... is the need for baseline data with respect to the local streams. Chesapeake Bay, which is near and dear to ... those of us who live here, has a major problem with nutrients and increase in sedimentation due to human activity, specifically construction, and the construction planned for this site is going to be quite extensive. So, there is a need for getting some baseline data with regards to the impacts of the local streams that go into the Bay. (**0008-26-1** [Kilbourne, Hali])

Comment: I highly recommend a more thorough documentation of baseline nutrient and sediment loads from streams feeding John's Creek, monitoring of nutrient and sediment loads during construction, daily monitoring by the soil conservation district of stormwater BMPs. (**0008-28-6** [Harris, Lora])

Response: *Baseline water quality data in Johns Creek and Goldstein Branch were collected by UniStar during September 2006 and March 2007. The NRC does not have authority to require* *additional monitoring. Nutrient data that were collected during 2006 and 2007 are discussed in Section 2.4.2.1 of the EIS within the context of State of Maryland thresholds for evaluating water quality (Southerland et al. 2005). Only total phosphorus (Johns Creek both surveys) and total nitrogen (Johns Creek Fall 2006) exceeded the State “low” threshold (0.025 and 1.5 mg/L, respectively) in either stream. Total suspended solids data were collected during the same surveys. UniStar recently made available the results of a stormwater management study that it conducted on the Calvert Cliffs site in August through October 2009 (EA Engineering 2010). The study provides additional information about nutrients and sediment loads that occur in the streams on the site during storm events. Section 2.4.2.1 of the EIS was revised to include total suspended solids data and a discussion of “wet” conditions data.*

Comment: The DEIS reports a natural oyster bar (NOB 19-2) just off shore of the Calvert Cliffs site. It also reported that dredging of the barge dock area and the trenching of the cooling water discharge pipe will have impact to this oyster bar area. Methods to avoid impact to the oyster bar should be included; if impacts are unavoidable, minimization of impacts are expected and appropriate compensatory mitigation should be proposed as required by 40 C.F.R 230.l0(d); 230.93. (**0009-1-4** [Magerr, Kevin])

Response: *Potential impacts to Natural Oyster Bar (NOB) 19-2 are discussed in Section 4.3.2.2 of the EIS. Some disturbance of oyster habitat is unavoidable. The State of Maryland has specified that UniStar should use appropriate time-of-year dredging restrictions to minimize impacts to the oyster bar. The State dictated that UniStar should fund the cost of moving, creating, or restoring oyster habitat equal to the area of the bottom in NOB 19-2 that would be directly, adversely affected by building Unit 3. The State’s conditions imposed on activities affecting the oyster bed would, if followed, minimize direct effects to oysters and would be expected to result in no net loss of potential oyster habitat. The Corps of Engineers regulates work in waters of the United States, including jurisdictional wetlands. A permit decision will reflect consideration of whether the project could not be reconfigured or reduced in scope to further minimize or avoid adverse impacts to Waters of the U.S. This comment was considered in the evaluation of the Phase II Mitigation Plan, a summary of which is included in Appendix K of the EIS. The permit, if issued, will include special conditions addressing mitigation. No change to the EIS was made as a result of this comment. The Corps permit, if issued, will include special conditions addressing mitigation.*

Comment: EPA agrees with the DEIS that the impacts to the aquatic resources due to the construction of Unit 3 and the 130 acre increase of impervious area can be classified as moderate. EPA believes the credited mitigation should include mitigation measures that are separate from measures that are required under other regulatory mechanisms. (**0009-1-11** [Magerr, Kevin])

Response: *Table 4-10 of the EIS lists mitigation measures by topic. Other Federal and State agencies have the regulatory mechanisms to credit mitigation, but NRC lacks such statutory authority. Potential mitigation measures were not used to determine aquatic resource impact levels. The Corps will ensure that mitigation required for a permit, if issued, meets its program requirements. The Phase II Mitigation Plan includes compensatory mitigation for tidal and non-*

tidal waters and non-tidal wetland impacts, a summary of which was included in Appendix K of the EIS. No change to the EIS was made as a result of this comment. The Corps permit decision will be made following issuance of the final EIS.

Comment: The FEIS should include a discussion of mitigation measures for all water related construction activities (cooling water intake and discharge structures, fish return system, barge dock improvements and access channel, etc.) that minimize impacts to the aquatic resource. Those measures should include but not be limited to aquatic resource seasonal construction restrictions, the employment of noise or shock abatement systems, and turbidity abatement measures. (**0009-1-14** [Magerr, Kevin])

Response: *Mitigation measures for dredging, including turbidity abatement, are listed in Section 4.3.2.1 and in Table 4-10 of the EIS. Potential mitigation measures for sound impacts were added to Section 4.3.2.1. The Corps will ensure that mitigation required for a permit, if issued, meets its program requirements. The Phase II Mitigation Plan includes compensatory mitigation for tidal and non-tidal waters and non-tidal wetland impacts, a summary of which was included in Appendix K of the EIS. The Corps permit decision will be made following issuance of the final EIS.*

Comment: EPA does not agree with the DEIS statement that the Chesapeake Bay has generally high productivity (page 5-16, line 12). To the contrary, EPA and others have reported that the Chesapeake Bay continues to have poor water quality, degraded habitats and low populations of many species of fish and shellfish (EPA Bay Barometer EPA-903-R-09001, March 2009). However, EPA does agree with the DEIS that the primary concerns for aquatic resources related to the water intake and consumption use are the amount of water drawn from the cooling water source, the Chesapeake Bay, and the potential for organisms to impinged on the intake screens, entrained in the cooling water system or entrapped within the common intake forebay. EPA has concerns with the mortality of the billions of aquatic organisms including fish fertilized eggs, larvae, juveniles, and adults associated with the existing, and now with additional impacts related to the proposed cooling system for unit 3. EPA believes that the overall aquatic mortality rate should be reduced. EPA suggest that a discussion of possible measures to reduce the overall mortality rate from Units 1, 2 and 3 be included in the DEIS. Possible considerations should include but not be limited to the design of a comprehensive closed loop cooling water system for Units 1, 2 and 3. (**0009-1-15** [Magerr, Kevin])

Response: *Section 2.4.2.4 of the EIS includes a description of the various issues and stressors that face aquatic habitats in the Chesapeake Bay. Section 7.3.2.3 acknowledges the degraded nature of the Bay. Regardless, Chesapeake Bay still is considered one of the "… most biologically productive estuaries in the world" (74 FR 23099). As one example of this productivity, the Bay Barometer for the Year 2009 documents an increase in the population of reproductive age blue crabs in the Bay to about 233 million individuals, the highest number since 1993 (CBP 2010). Population estimates based on the 2010 winter dredge survey are about 300 million reproductive individuals with a total population estimate of about 658 million blue crabs, the highest population estimate since 1997 (MDNR 2010). No change to the EIS was made as a result of this comment. The cumulative effects of entrainment by existing*

CCNPP Units 1 and 2, Chalk Point, and H.A. Wagner power plants, which use once-through cooling systems, and the proposed Unit 3, which proposes a closed-cycle system, are addressed in Section 7.3.2.2. Research cited in the EIS found that entrainment by CCNPP Units 1 and 2 has not significantly affected aquatic resources in Chesapeake Bay although the localized effects of entrainment by the Chalk Point and Wagner plants on bay anchovy populations are substantial. The NRC considered that the additional entrainment by the intake system for proposed Unit 3, which would withdraw less than 2 percent of the volume of water withdrawn by the existing CCNPP units, would not add significantly to entrainment impacts attributable to all three existing power plants. Section 7.3.2.2 of the EIS was revised to include a brief statement about reducing the cumulative mortality attributable to power plants with once-through cooling systems. Because redesigning the cooling systems for Units 1 and 2 would be beyond the scope of the proposed Federal action and likely would be cost prohibitive for the licensee, NRC did not consider a comprehensive closed-loop cooling water system a viable mitigation measure; therefore, such a mitigative measure was not included in the EIS.

Comment: An increase in thermal discharge may also contribute to hypoxic zones or to the exacerbation and spread of parasites like *Perkinsus marinus* within Oyster populations. There is some concern that the Abbe (1987) study may not be representative of current conditions in the waterbody due to ongoing development of the Chesapeake watershed. (**0009-1-16** [Magerr, Kevin])

Response: *The thermal discharge from proposed Unit 3 is discussed in Sections 5.2.3.1 and 5.3.2.1 of the EIS. The primary factors driving hypoxia in Chesapeake Bay are nutrient input and water column stratification (EcoCheck 2010) and summertime wind direction (Scully 2010). These factors are not related to localized, small increases in water temperature. Local low dissolved oxygen conditions attributable to summer water conditions and prolonged west or southwest winds have occurred near CCNPP Units 1 and 2 (NRC 1999b). In Section 5.2.3.1, the EIS states that the area of bottom touched by water 2°C above ambient would be about* 2.9×10^4 *ft*^{2}*, which is 0.02 percent of the permissible area per COMAR 26.23.01.01. The thermal plume from proposed Unit 3 would not add significantly to that from CCNPP Units 1 and 2, which covers an area of about* 3.7×10^6 *ft*^{2} *(NRC 1999b). The proposed Unit 3 thermal plume's predicted small size and small, localized temperature increase suggest that it would not have any effect on localized or Bay-wide hypoxia. The thermal plume from proposed Unit 3 would extend somewhat onto NOB 19-2. Infestations by Perkinsus marinus, a protozoan parasite, ranging from 0 percent to 97 percent, have been documented on NOB 19-2 since 1990 (Tarnowski 2010) despite the thermal discharges from Units 1 and 2. Infestation rates from 2006 to 2008 ranged from 43 to 87 percent. However, the oyster resource on NOB 19-2 is very poor (Section 2.4.2.5), and the oyster bar has had little to no spat recruitment since 1991 (Tarnowski 2010). The thermal plume's predicted small size and small, localized temperature increase would not be expected to significantly affect the local or Bay-wide occurrence of Perkinsus. The Abbe (1987) paper was cited in reference to the potential effects of the discharge from CCNPP Units 1 and 2 at the time of the study. No change to the EIS was made as a result of this comment.*

Comment: Two weeks ago the federal strategy for returning the Chesapeake Bay was released, one year after an executive order was offered by President Obama for stronger efforts to meet the directives of the Clean Water Act in this region. As he mentioned, this has been long-recognized that land use in watersheds is directly linked to loadings of contaminating nutrients and sediments to the Chesapeake Bay. The executive order, final strategy emphasizes the fact that implementation of Bay restoration practices at the county and municipal level. In this regard, Calvert County is well ahead of the game, having successfully completed their water resources element and working now to design a watershed implementation plan for the 26 sub-watersheds located in the county. Ultimately the county watershed implementation plans from across the state will be used by Maryland to meet the requirements of the executive order. This is all part of the total maximum daily load process, and one of my comments explicitly is that the DEIS does not appear to address the TMDL [Total Maximum Daily Load] requirements. Given this context, I was greatly surprised to find virtually no description of watershed scale loadings or baseline measurements of sediments or nutrients documenting current conditions for the streams that will be impacted by the construction of the third reactor. There is description in the DEIS of the headwater streams and the moderate impact that they will have on receiving waters. However, there's no quantitative data, and that's my main criticism of the DEIS is that as scientists you would want to be able to have measurable mitigation efforts. And there are certainly many tools that the folks could use to make these estimates. For example, right now we have the Chesapeake Bay watershed model, the HSPF [Hydrological Simulation Program Fortran] version 5, which could be used to do both the current loadings for the sub-watershed where the third reactor is located, as well as scenarios related to impact. (**0008-28-1** [Harris, Lora])

Response: *There are no draft or approved TMDL requirements for nutrients or sediments established yet for the Lower Patuxent River or other Calvert County sub-watersheds (MDE 2010a, b). The EPA, in conjunction with regional jurisdictions, is preparing draft nutrient and sediment TMDLs for Chesapeake Bay (74 FR 47792). The draft report is not available yet for public review. EPA has drafted allocations by major basin. The proposed allocations for the Patuxent River Basin are 2.85 million pounds per year (nitrogen) and 0.21 million pounds per year (phosphorus). The proposed total allocations to the bay for nitrogen and phosphorus from all Maryland sources (excluding atmospheric deposition) are about 39 million pounds per year and 2.7 million pounds per year, respectively. The Patuxent River contribution to the bay is very small compared to contributions from all other rivers. Baseline water quality data in Johns Creek and Goldstein Branch were collected by UniStar during September 2006 and March 2007. The NRC does not have authority to require additional monitoring. Nutrient data that were collected during 2006 and 2007 are discussed in Section 2.4.2.1 of the EIS within the context of State of Maryland thresholds for evaluating water quality (Southerland et al. 2005). Only total phosphorus (Johns Creek both surveys) and total nitrogen (Johns Creek Fall 2006) exceeded the State "low" threshold (0.025 mg/L and 1.5 mg/L, respectively) in either stream. Total suspended solids data were collected during the same surveys. UniStar recently made available the results of a stormwater management study that it conducted on the Calvert Cliffs site from August through October 2009 (EA Engineering 2010). The study provides additional information about nutrients and sediment loads that occur in the streams on the site during storm events. The generally low nutrient levels in Johns Creek and the small contribution made by the Patuxent River to total nutrient loads in the Bay make it most likely that the effects of an* *abnormal discharge of sediment into the Bay during the construction of proposed Unit 3 would be relatively short-term. Section 2.4.2.1 of the EIS was revised to include information on appropriate watershed loadings, total suspended solids data, and a discussion of "wet" conditions data.*

Comment: Section 3.2.2.1 describes the intention of the stormwater management system to provide a safety function to keep locally intense precipitation from flooding safety related structures. It is unclear whether the stormwater management system ... maintains stream ecological flows. EPA recommends that this be clarified in the FEIS. (**0009-1-30** [Magerr, Kevin])

Response: *The ecological aspects of stormwater management are addressed in Section 5.3.2.1 of the EIS. UniStar has developed a conceptual stormwater management plan (Bechtel 2008) that describes a general approach to stormwater management. In the conceptual plan, UniStar describes the use of sand filter ditches and stormwater retention basins that would control day-to-day and storm event run-off. The retention basins would control discharges so predevelopment levels would not be exceeded. This is mentioned in general terms in Section 5.3.2.1. UniStar recently made available the results of a stormwater management study that it conducted on the Calvert Cliffs site from August through October 2009 (EA Engineering 2010). The study provides additional information about nutrients and sediment loads that occur in the streams on the site during storm events. Sections 2.4.2.1 and 5.3.2.1 of the EIS were modified to reflect the recently completed study.*

Comment: Locating the proposed unit at the site of the existing Constellation Generation facility will consolidate impacts to fish resources. The proposed closed loop cooling system, lower intake volumes from the Bay, and use of intake design parameters that minimize fish entrainment and impingement will maintain fish mortality rates at levels significantly lower than those from the existing plant intake. (**0017-1-1** [Colosi, Peter])

Response: *This comment supports the discussion in Section 5.3.2.1 of the EIS that describes entrainment by the proposed Unit 3 as being substantially less than that occurring at CCNPP Units 1 and 2. No change to the EIS was made as a result of this comment.*

E.2.12 Comments Concerning Socioeconomics

Comment: [I]t's my strong belief that moving this process forward to bringing Calvert Cliffs 3 to fruition is necessary and indicated for our local and state economy. (**0007-1-7** [O'Donnell, Anthony])

Comment: In these tough financial times, it is economic development like the construction of a third reactor at Calvert Cliffs, that will provide the socioeconomic push many of our small businesses need to stay afloat and prosper. The Solomons Business Association welcomes that development and looks forward to the new jobs, new businesses and the new visitors that it will bring to our region. (**0007-14-3** [Simpson, Lauren])

Comment: [A]ll the impacts associated with the socioeconomics of proposed Unit 3 are identified as small. (**0007-15-2** [Vaughn, Jackie])

Comment: And number three is really for the employment opportunities for businesses and for minorities I've seen that UniStar and Constellation want to provide for this county. (**0007-16-3** [Wilson, Robert])

Comment: The NRC action affirms that the project's environmental stewardship and its potential benefits to the local community are substantial. (**0007-18-2** [Pennoyer, Gordon])

Comment: For the local economy, this project has the potential to create approximately 4,000 jobs during peak construction, and approximately 400 permanent high-paying jobs after completion of the project, as well as contribute millions of dollars annually to state and local tax revenues. (**0007-18-4** [Pennoyer, Gordon])

Comment: It is accepted that Calvert Cliffs is a safe plant. In fact, the voices most often heard refer to Calvert County's beauty, the great fishing on the bay, the open, natural spaces, the pristine waterways and woodlands. My colleagues on the [Calvert County Tourism Advisory] Commission and I are confident that this acceptance will continue if and when the Unit 3 Project moves forward. The overall success our county has had in balancing growth, business development and environmental protection is a beacon to many other jurisdictions. This success is partly due to Constellation Energy's careful stewardship not just of the environment, but of our community as a whole. As a result, there is no controversy in our counties surrounding Calvert Cliffs despite a few voices [to] the contrary. (**0007-20-2** [Bless, Melissa])

Comment: Tourism is a huge economic engine in Calvert County, and we [Calvert County Tourism Advisory Commission] thank Calvert Cliffs for its ongoing commitment to the environment. It is a commitment that helps the county maintain its reputation as a destination offering uncommon natural wonders. (**0007-20-4** [Bless, Melissa])

Comment: The Maryland State and DC AFL/CIO [America Federation of Labor and Congress of Industrial Organizations—commonly referred to as America’s Union Movement] with over 500 affiliated local unions and over 350,000 members, have endorsed the construction and the operation of the new third reactor at Calvert Cliffs because of the positive impact the project will have on the state and local economies. This project provides considerable employment during the entire construction process, including at least 4,000 jobs at peak construction. These are good jobs. These are jobs with prevailing wage, with pensions and with health benefits. These are family-sustaining jobs. They add to Maryland's economy, and they add to southern Maryland's economy. We all need that during this time of recovery. In addition during the operation once the final construction is over, there are 400 permanent jobs. High-paying permanent jobs with people who will be living in southern Maryland. Hopefully, Calvert County. This provides millions and millions to the state revenue and the local economy. According to the Nuclear Energy Institute, the average nuclear power plant generates $430 million in sales of goods and services. This is economic output in the local community and almost $40 million dollars in total labor income. (**0007-21-2** [Edwards, Donna])

Comment: The Calvert County Board of Commissioners also estimates the expansion could provide the county with millions of dollars in additional annual revenue during the first 15 years of operation. This enormous influx of revenue will enhance the quality of life in Calvert County, as well as in southern Maryland. It will provide necessary funding for public education, roads, law enforcement, fire and rescue services and enhance the local recreational venues. (**0007-21-3** [Edwards, Donna])

Comment: Given the huge positive economic impact and the NRC's preliminary environmental impact recommendation, we strongly support that the project goes forward. (**0007-21-4** [Edwards, Donna])

Comment: For the local economy, this project has the potential to create approximately 4,000 jobs during the peak construction period, and approximately 400 permanent high-paying jobs after completion. This will also contribute millions of dollars to state and local tax revenues. (**0007-22-3** [Kennedy, Sherri])

Comment: Others have and will talk about these jobs the project will create, and I agree that Maryland desperately needs these jobs. (**0007-23-2** [Martin, Kendall])

Comment: Our members won't just build this project and leave. They also live here in southern Maryland. They raise their families here. They hunt here. They fish here in southern Maryland, and we are concerned with protecting the natural beauty here as well. (**0007-23-3** [Martin, Kendall])

Comment: The NRC has done a fine job of outlining the socioeconomic effects that could occur as a result of a third reactor at Calvert Cliffs. The socioeconomic impact specifically focuses on how the community will be affected in the area of labor availability. ... I am delighted to see this outstanding potential opportunity for students. (**0007-4-1** [Navarro, Tony])

Comment: [W]e see this as a real opportunity, a positive opportunity to provide our local students with training to support the expansion of Calvert Cliffs, and perhaps the opportunity to obtain training that would span a career. (**0007-4-2** [Navarro, Tony])

Comment: I vow to do my best to support the socioeconomic impact from the proposed Unit 3 as an opportunity, and accept the impact identified by the Draft Environmental Impact Statement as a challenge to provide a brighter future, increased earnings capacity and a lifelong career for the students that have the honor of shepherding through our education system. (**0007-4-3** [Navarro, Tony])

Comment: For the local economy, this project has the potential to create approximately 4,000 jobs during peak construction period and approximately 400 high-paying jobs after completing, as well as contribute millions of dollars to state and local tax revenues. (**0008-12-3** [Pennoyer, Gordon])

Comment: I'd like to focus for a moment on the current economic impact of Calvert Cliffs, which is remarkable. Calvert Cliffs employs over 800 individuals from the region and contributes significant financial resources that fund a variety of public services. As identified in the draft EIS, a new reactor would create an additional 4,000 jobs during the peak construction period, and approximately 360 permanent jobs after completion. The draft EIS states that the reactor's construction is considered a moderate to large [beneficial socioeconomic] impact. We view this as a positive economic impact and one that is welcomed in our regional community. (**0008-2-4** [Hodge, Gary])

Comment: Building a new generation of nuclear power plants in the United States that have the potential to provide safe, reliable, clean energy needed to fuel America's economic growth while creating hundreds of thousands of good-paying jobs. Building just one plant will create 4,000 skilled jobs for electricians, pipefitters, welders, cement masons and other skilled trades during construction, and operating the plant will require several hundred more permanent employees. In addition, nuclear power plant fuels local and regional economics. According to a report from the Nuclear Energy Institute, the average nuclear plant generates approximately 430 million dollars in sales of goods and services in the local community and nearly $40 million in total labor income annually. If America reached a goal of generating 30 percent of our electricity through nuclear power by 2030, that mark would require 170,000 new plant employees, 65,000 skilled trades workers and 12,500 nuclear engineers. (**0008-20-2** [Graham, Chuck])

Comment: On a national level, the demand for energy continues to surge while our work force remains relatively flat. Additionally, in the case of nuclear power, companies are planning to build more than 30 new reactors nationwide. These projects will require construction personnel, engineers, physicists, power plant operators, technicians and many other types of workers. Here in Maryland energy companies are facing a critical shortage of craft workers. Based on energy company timelines, Southern Maryland will need 4300 skilled trades workers for energy facility and utility construction through 2015, plus a hundred more permanent workers. And these numbers do not include the permanent work force needs with the proposed Calvert Cliffs third reactor. (**0008-22-1** [Fleming, Richard])

Comment: We have received over $260,000 in financial and other tangible support from Constellation and CENG LLC to purchase equipment and establish scholarships. We also recently received word that we will be receiving an NRC grant of over $130,000 for additional scholarship support as well as funding support to implement the nuclear engineering technology program. The college has also established a Center for Trades and Energy Training, to train electricians, welders, HVAC technicians and carpenters. (**0008-22-2** [Fleming, Richard])

Comment: We're working with our area's public schools to promote and implement a STEM program and our academic programs in science, technology, engineering and mathematics are poised to help create a ready work force for the 21st century. We believe the economic impact of the new reactor will be significant and, as I stated earlier, the college stands ready to help the Nuclear Energy Institute and Calvert Cliffs in particular, train a highly-qualified work force to meet short-term needs as current employees retire or leave the industry and to meet long-term needs as the new reactor is completed and becomes operational. The expansion will provide high-paying employment opportunities for many years to come and will help those individuals who deserve top-quality education and affordable higher education. (**0008-22-3** [Fleming, Richard])

Comment: I'd like to say something about jobs. It's clearly important to this area, to all the United States, potential for over 4,000 new jobs during construction and more than 300 new permanent jobs at that site that could be more than 30 percent higher paying than other local jobs. And not only jobs like mine that are, you know, white collar engineering jobs, but good blue collar jobs for highly skilled craft workers, welders, pipefitters. We need those people to help us out and the potential to bring those new jobs to Calvert County is something we absolutely should pursue. (**0008-23-6** [Robinson, Duncan])

Comment: [T]he socioeconomic impacts which we've heard a little bit about tonight. Starting with the increase in tax revenue that would come from the construction and operation of Calvert Cliffs 3, it would further fund things like education, school construction, roads, law enforcement, fire and rescue services. (**0008-25-3** [Nickels, Tiffany])

Comment: For the local economy, Calvert Cliffs Unit 3 project had the potential to create approximately 4,000 jobs during the peak construction period and approximately 400 permanently high-paid jobs after completion. This is not insignificant, especially in this tough economic climate. The energy -- the Nuclear Energy Institute reports the jobs in nuclear energy facilities typically pay 36 percent more than the average salary in the area where they operate, which is very true here. The nuclear facility also creates approximately 500 additional local jobs to provide the goods and services necessary for supporting operations. The increased spending associated with Unit 3 would certainly increase the economic activity in our region. (**0008-3-6** [Clark, Jerry])

Comment: The [Southern Maryland] Consortium [of African American Community Organizations] had three concerns, jobs, contract opportunities [and the environmental impact, specifically, but not limited to storage of the nuclear waste which was widely communicated (this part of comment was addressed separately)]. (**0008-6-2** [Spencer, Doris])

Comment: From an economic development standpoint, the presence of Calvert Cliffs is significant to Calvert County. Before Calvert Cliffs, Calvert County was one of the poorest counties in Maryland. Today, Calvert Cliffs' impact continues to resonate through job creation, increased tax base as well as through notable financial and volunteer contributions. (**0014-1-4** [Barber, Alonzo])

Response: *These comments generally express support for the proposed Unit 3 based on the potential positive socioeconomic impacts it would be expected to bring to the region. Socioeconomic impacts of construction and operation are discussed in Sections 4.4 and 5.4 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: Section 4.4.4.1. We believe that the DEIS understates the potential impact of construction worker traffic on Calvert County. The Maryland State Highway Administration has not yet agreed to an acceptable Traffic Management Plan for mitigating impacts. (**0003-1-6** [Gray, Susan])

Response: *Section 4.4.4.1 was updated to reflect recent findings of the 2011 Traffic Impact Analysis (KLD 2011). The review team determined traffic impacts from construction workers to be noticeable but not destabilizing (a MODERATE impact level). .*

Comment: Page 5-35. There is a significant difference between the property tax revenue stream estimated by UniStar (and stated in the DEIS), and PPRP's [Maryland Power Plant Research Program] estimate of the same. The property tax revenue stream stated in the DEIS amounts to $57.1 million in the first year of operation, declining over 15 years to $42.8 million. The property tax revenue stream is based on a capital cost of $5,000/kW, as estimated by UniStar in a response to a request for additional information (RAI), dated November 16, 2009. However, in the CPCN [Certificate of Public Convenience and Necessity] Case 9127 evaluation, PPRP estimated the total to be approximately $20 million in new tax revenues in the first year of operation. PPRP's estimate was based on a Calvert County analysis of the proposed 50%, 15-year tax credit to Constellation Energy Group LLC (August 2006). This does not change the conclusion that CCU3 will result in a large positive benefit in property tax revenue to Calvert County. The NRC may want to note in the final EIS the fact that alternative methods of estimating future tax revenues may produce significantly different results, given the fact that detailed information on capital expenditures is not known, or is proprietary, at this time. (**0003-1-8** [Gray, Susan])

Response: *Several factors were used in determining property taxes, including the assessed value of the plant and the county property tax rates. Sections 4.4, 5.4, 7.4, 9.3, and 10.6 of the EIS were updated with more recent tax information provided by Calvert County (Calvert County 2010).*

Comment: Section 5.4.4.1, Page 5-36, lines 28-36. It is recommended that the EIS reflect that the TIS [traffic impact study] utilizes an 80/20 split (north/south) for construction traffic as required by the SHA [State Highway Administration]. With this split of construction-related traffic, the majority arrives from and leaves to the north. As such, the SHA has concurred that the scope of the TIS should include only the two nearest southern intersections as they would encompass the extent of potentially affected roads. (**0004-1-13** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *Section 5.4.4.1 of the EIS was updated to reflect the recommendations of the 2011 Traffic Impact Analysis (KLD 2011) in which some of the underlying assumptions were changed. The updated draft TIA has been submitted to the State and is currently under review.*

E.2.13 Comments Concerning Environmental Justice

Comment: The resolution of Figures 2-16 and 2-17 is too small to provide any meaningful information. It is difficult to see or identify the areas of concern, or to verify that the right areas have been identified. (**0009-1-20** [Magerr, Kevin])

Response: *EIS figures must balance the need to include a multitude of pertinent information with legibility and size constraints. Figures 2.5-7 and 2.5-9 (pages 2-460 and 2-462) in the ER*

(UniStar 2009) are similar figures. No change to the EIS was made as a result of this comment.

Comment: The Environmental Justice Methodology discussion starts on page 2-115. The second of the screening criteria states, the percentage of the population of interest in the census block group is significantly greater (at least 20 percent) than the minority or low-income population percentage in the respective state. What is the scientific or statistical basis for the selection of the minority or low-income population percentage having to be at least 20 percent greater than the minority or low-income population of the respective state? (**0009-1-17** [Magerr, Kevin])

Response: *The basis for identifying minority and low-income populations is the Commission's Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (69 FR 52040), which outlines the process in which minority populations are identified for the purposes of the environmental review: A 50-mi radius is used to identify environmental justice populations meeting the low-income or minority criteria. "A minority or low-income community is identified by comparing the percentage of the minority or low-income population in the impacted area to the percentage of the minority or low-income population in the county and the state. If the percentage in the impacted area significantly exceeds that of the state or the county percentage for either the minority or low-income population, environmental justice will be considered in greater detail." "Significantly" is defined by staff guidance to be 20 percentage points. Alternatively, if either the minority or low-income population percentage in the impacted area exceeds 50 percent, environmental justice matters are considered in greater detail. No change to the EIS was made as a result of this comment.*

Comment: The Environmental Justice guideline stated in the DEIS may be interpreted two ways. It is not clear if the guideline calls for increasing the state minority or low-income population percentage by 20 percentage points, for example from 10% to 30% for benchmarking purposes, or if the intension is to increase the state minority or low-income population percentage by 20% from 10% to 12%, for example. The clarification of this benchmark is very important to the assessment. In fact, the first method, adding 20 percentage points to the state minority or low-income population percentage, has a disproportionately high impact on communities in states with low percentages of minority or low-income populations. Setting the benchmark at the state minority or low-income population percentage plus 20 percentage points would mean that a community in a state with a minority or low-income population percentage of 5% would have a benchmark of 25%, [an] increase of 400%. A community in a state with a minority or low-income population percentage of 10% would have a benchmark of 30%, an increase of 200%. On the other hand, increasing the state minority or low-income population by 20% would mean that a state with a minority or low-income population of 5% would have a benchmark of 6%, a 20% increase. A state with a 10 percent minority or low-income population would have a benchmark of 12%, a 20 % increase, and a state with a minority or low-income population of 30% would have a benchmark of 36%, a 20% increase. Which method is being used? (**0009-1-18** [Magerr, Kevin])

Response: *The NRC guidance is to identify minority and low-income populations that are 20 percentage points higher than the respective State average. The NRC's guidance was followed in performing the analysis for this EIS. Section 2.6.1 of the EIS was clarified to reflect this comment.*

Comment: Two public comments on Environmental Justice (as reported in the appendix) do not assure that the interests and concerns of minority and low-income populations were adequately represented. It seems that a number of groups participated in the outreach effort, but the information presented does not provide enough information to support the notion that the outreach was appropriate, adequate or that it reached significant numbers of people in the target communities. Grassroots Environmental Justice Organizations and organizations representing the interests of minority and low-income populations were not evident. (**0009-1-21** [Magerr, Kevin])

Response: *Members of the minority and low-income communities were contacted either in person or in some cases by telephone. A list of organizations contacted is listed in Appendix B of the EIS as well as in a separate report cited in the environmental justice sections of Chapters 2 and 4 (Secrest et al. 2010). This report details discussions with community members/leaders for all socioeconomic and environmental justice outreach. Additional language was added in Section 2.6.2 to clarify this point.*

Comment: The review of subsistence and communities with unique characteristics seems inadequate. It is suggested that Dr. Vince Leggett of the Maryland Department of Natural Resources be contracted [contacted] regarding this issue. It appears the assessment did not include any dialogue with the minority populations in the area, minority organizations related to such interests (there are such organizations), nor did the study use any data for groups of people in close proximity to the site. It seems unreasonable to conclude that no potential concern exists, when the appropriate data required to answer the question were not obtained. The subsistence fishing information gathered for minority communities at the edge of the study area should have been insightful, and lead to more focused study in the area of greatest concern. (**0009-1-22** [Magerr, Kevin])

Response: *Discussions of outreach efforts and identification of subsistence and communities with unique characteristics near the Calvert Cliffs site are presented in Sections 2.6.2 and 2.6.3. As stated in Section 4.5.4.1 of the EIS and documented in Secrest et al. (2010), minority and low-income community leaders did not know of any subsistence activities occurring in the area near the proposed facility. The site and shoreline near the site also are restricted from public use. No studies were found documenting subsistence activities in close proximity to the site where impacts could be felt by minority and low-income populations. Dr. Vince Leggett was contacted in regards to subsistence activities and populations of interest in Calvert County. He indicated that he had limited knowledge of current subsistence practices or populations of interest in the vicinity of the Calvert Cliffs Nuclear Power Plant, though he is aware of African American fishermen and women who fish on head boats and charter boats docked on Solomons Island. He also stated in the past there had traditionally been African American enclaves that were involved in subsistence fishing along the Patuxent River, its tributaries, and* *the Chesapeake Bay. The review team could not find any information indicating these practices still occur today near the Calvert Cliffs site. Dr. Vince Leggett suggested contacting the Morgan State University Estuarine Research Center in Calvert County for further information. Researchers at the Estuarine Research Center that the review team spoke to were not aware of any subsistence fishing activities occurring near the Calvert Cliffs site or on the Patuxent River. They indicated they were aware of subsistence fishing in other areas of the Chesapeake Bay such as the Baltimore area but nowhere near the Calvert Cliffs site. No change to the EIS was made as a result of this comment.*

Comment: Section 4.5.1, Health Impacts (and in other areas of the document), follows a train of thought that causes concern. It focuses on unique practices or characteristics that would lead to minority populations being impacted differently from the general population. That is an appropriate consideration. But it is also important to look also at where are the exposures occurring? What other risks or concerns are there that would put one segment of the population at elevated risk? Are there factors that need to be taken into consideration in this assessment that may provide information as to the potential for adverse impacts to occur in minority or low-income populations? Questions should focus on proximity to sources of exposure. Are there minority or low-income populations in close proximity to construction or other activities that may have adverse impacts or be sources of exposure? Are construction activities occurring in close proximity to minority or low-income populations? How will fugitive dusts be controlled? Who lives closest to these emissions? Is there the potential for adverse impacts upon drinking water sources in the area? If so, who lives near those sources? How will fishing be impacted by the project? What impact will the project have on those that are subsistence fishermen? These are the types of questions that EPA believes need to be asked. (**0009-1-23** [Magerr, Kevin])

Response: *The review team did not find any risk factors or concerns that would impact minority or low-income individuals during its research and community outreach. Section 2.6 of the EIS describes the location of the nearest minority populations. Fugitive dust mitigation is discussed in Sections 4.4, 4.5, and 4.7. The nearest residence is discussed in Sections 4.4 and 4.8. Surface and groundwater impacts are discussed in Sections 4.2 and 5.2. Aquatic impacts are discussed in Sections 4.3 and 5.3. No subsistence fishing was found to occur in the vicinity of the proposed site. No change to the EIS was made as a result of this comment.*

Comment: No data are presented anywhere in this document that support statements stating that no adverse health, radiological, or non-radiological impacts are to be expected for minority and low-income populations as a result of the project. EPA recommends that supportive data and references be provided. [Where are the studies?] (**0009-1-24** [Magerr, Kevin])

Response: *The review team found that all environmental emissions and operation dose assessments are well within NRC and EPA regulations, there is no pathway for measurable emissions to reach surrounding populations, and no demographic subgroup is affected differently than another subgroup. No studies were identified that indicated minority and low-income individuals would be more susceptible to non-radiological emissions or radiological doses. Sections 4.8 and 4.9 of the EIS discuss the non-radiological and radiological health impacts on the public during construction and Sections 5.8 and 5.9 discuss non-radiological and radiological impacts on the public during operation of the proposed facility. Sections 7.7 and 7.8 address all potential cumulative non-radiological and radiological impacts on the public from* *operation of the proposed Unit 3. The environmental justice analyses provided in Sections 4.5 and 5.5 of the EIS address disproportionately adverse human health impacts on low-income and minority communities that could potentially be produced by the construction and operation of the proposed Unit 3, and Section 7.4 addresses cumulative impacts in terms of environmental justice. No change to the EIS was made as a result of this comment.*

Comment: The health considerations cited on pages 2-116 and 2-117 seem vague and subjective. The health considerations include:

- Are the radiological or other health effects significant or above the generally accepted norm?
- Is the risk or rate of hazard significant and appreciably in excess of the general population?
- Do the radiological or other health effects occur in groups affected by cumulative or multiple adverse exposures from environmental hazards?
- Is there an impact on natural or physical environment that significantly and adversely affects a particular group?
- Are there any significant adverse impacts on a group that appreciably exceed or [are] likely to appreciably exceed those on the general population?
- Do the environmental effects occur in groups affected by cumulative or multiple adverse exposures from environmental hazards?

For question One, what is meant by significant? Are there health indicators or health benchmarks that could be used to focus the investigation objectively? What is meant by norms in this case? Is this language referring to state or national averages for health outcomes associated with the concern? Question Two poses a similar problem. How do we determine what is appreciably in excess of the general population with respect to risk or rates of hazard? What are the benchmark values that are being used to conduct this evaluation? Since work on cumulative risk and cumulative impacts is limited, how can Question Three be fairly used as an assessment criterion? The state of study of cumulative impacts is such that Questions Three and Six can not be accurately answered. EPA believes additional thought needs to be put into the development of more clear and concise assessment criteria that are objective in nature, and that represent real opportunities to identify and assess at-risk populations. (**0009-1-19** [Magerr, Kevin])

Response: *The environmental justice analysis was conducted in accordance with NRC guidance. The methodology used in this analysis is described in Section 2.6.1 of the EIS. The staff uses as guidance the NRC Office of Nuclear Reactor Regulation Office Instruction Number LIC-203 (NRC 2001), which is referenced in the Commission's Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (69 FR*

52040). The policy statement was issued for public comment, and the EPA provided its comments at that time (EPA 2004; ML040970507). The six questions regarding health considerations are drawn directly from the NRC LIC-203 guidance. No change to the EIS was made as a result of this comment.

E.2.14 Comments Concerning Historic and Cultural Resources

Comment: [W]e have implemented a memorandum of agreement with the Maryland's Historic Trust and the U.S. Army Corps of Engineers to protect both cultural and historical resources on site. (**0008-4-4** [Jarmas, Ed])

Response: *This comment supports the discussion in Section 4.6 of the EIS. No change to the EIS was made as result of this comment.*

Comment: Section 10.4.1.5, Page 10-15, lines 24-31. It appears that the word "commitments" should be "impacts". (**0004-1-17** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *The term "irreversible commitments of resources" was clarified in the referenced sentence in Section 10.4.1.5.*

E.2.15 Comments Concerning Nonradiological Waste

Comment: According to [the Virginia Department of Environmental Quality's (DEQ)] Waste Division, the project will take place in the State of Maryland. Therefore, no Virginia regulations are applicable. The DEQ Waste Division recommends that the following web sites may be useful to locate additional waste information for the facility:

- http://www.epa.gov/superfund/sites/cursites/index.htm or
- http://oaspub.epa.gov/enviro/ef_home2.waste

Furthermore, the Waste Division recommends the implementation of pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated for construction projects and facilities. All generation of hazardous wastes should be minimized and handled appropriately. (**0005-1-4** [Fisher, John] [Irons, Ellie])

Response: *Sections 3.4.4, 4.10, and 5.10 of the EIS discuss nonradioactive waste systems, including solid wastes that would be generated during building activities as well as hazardous and mixed wastes that would be generated during building and operation. Measures and controls to limit impacts during building and operation of proposed Unit 3 are discussed in Sections 4.11 and 5.12 of the EIS. No change was made to the EIS as a result of this comment.*

E.2.16 Comments Concerning Health – Nonradiological

Comment: There's also just one thing that I wanted to say. The noise issue, I know that they conducted some tests. It's also insufficient. The other one, the PPRP [Maryland Power Plant Research Program] study that was done for the LNG [liquid nitrogen gas] was used for this one here. It's also insufficient and incomplete. (**0007-6-13** [Sevilla, June])

Comment: The Applicant only conducted Leaf-on/Leaf-off scenarios in determining noise levels and the clearing of forests and shrubs which help alleviate noise were not considered in the calculations. Furthermore, the Applicant used only the CWS Cooling Tower noise as basis for these calculations. Noise from the ESWS Cooling Towers were not included in the study. All these omissions renders incomplete, the entire noise submission by the Applicant. See CPCN 9127 Noise submission of Applicant. (**0012-1-19** [Sevilla, June])

Response: *Background noise levels are discussed in Section 2.10.2 of the EIS. Noise impacts associated with building and operation of the proposed Unit 3 at the Calvert Cliffs site are discussed in Sections 4.8.2 and 5.8.2 of the EIS, respectively. Site-specific noise studies were conducted over a period of 3 years by UniStar (Hessler 2006, 2007, 2008). These studies included background noise-level assessments conducted during leaf-on and leaf-off seasons, and noise-level assessments during building and operation of the proposed Unit 3. Results were discussed in the EIS sections mentioned above. The studies did not specifically address noise assessments after onsite forest clearing; however, a substantial amount of intact forest would remain within the site boundary between the impact areas and the nearest noise receptors. The CWS cooling tower is the primary noise source, not the ESWS cooling towers. Additionally, design of the proposed facility calls for the ESWS cooling towers to be located in the power block, approximately 0.5 mi north of the CWS cooling tower, and further away from the nearest offsite resident. Sections 4.8.2 and 5.8.2 of the EIS were revised in response to this comment.*

Comment: When my wife and I and my son, we're all asthmatics, and when we lived further north we had more problems than since we moved down in Calvert County. And I love Calvert County. And our health seems to be pretty much intact since we've been here. (**0007-16-2** [Wilson, Robert])

Response: *This comment expresses general support for the existing facilities from a health perspective. No change to the EIS was made as a result of this comment.*

E.2.17 Comments Concerning Health – Radiological

Comment: The NRC staff has confirmed that UniStar's conclusions about exposures from routine operation of the reactor present negligible health threats. Perhaps, just perhaps not zero, but extremely small. Their analysis states that the average dose to the population living within 50 miles of the reactor will be 1/35,000th of the dose received from natural background. The maximally-exposed individual who is someone who is presumably chained to the fence of the reactor site, will receive a dose that's about 1/1400th natural background radiation in the region. Now, the way these numbers are presented in the Draft EIS, they're somewhat arcane … a lot of people don't really relate to numbers very well, and I think it may be instructive to the general reader to relate these doses to voluntarily-encountered radiation doses. (**0007-9-3** [Meadow, Norman])

Comment: [T]he only hazard that -- in terms of public health that people associate with nuclear power plants -- is a release of radiation which we've been told earlier is infinitesimally small compared to existing natural background radiation. (**0008-8-2** [Rogers, David])

Comment: Many fruits and vegetables, which are high in potassium, contain doses of a naturally radioactive isotope of potassium that are comparable to the doses that nearby residents will receive from the routine operation of all three reactors at Calvert Cliffs. We [the Maryland Conservation Council] suggest that the dose ingested with common foods and the difference in background radiation in different geographic regions be mentioned even briefly in the EIS. (**0007-9-5** [Meadow, Norman])

Comment: [I]f you were to move from Maryland to Denver, Colorado, your increase in background radiation would be by a factor of four, not 1/35,000th. (**0007-9-4** [Meadow, Norman])

Response: *These comments concern the radiation dose a member of the public would receive annually from all sources. Expected radiation doses from operation of proposed Calvert Cliffs Unit 3 are discussed in Section 5.9 of the EIS, and radiation doses from other sources including the fuel cycle and natural background are discussed in Section 6.1.5 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: In Section 5.9.3.3 of the Environmental Impact Statement, it raises a summary of the radiological impacts to members of the public. And the draft EIS has basically stated that the health impacts would be small. Now, in fact, I'm going to submit to you tonight that the impacts are unknown, and the concern is, is that -- that really right now, I think that a lot of what is being addressed is, in fact, premature data or damaged data. The Draft Environmental Impact Statement, for example, relies, in part, upon the National Cancer Institute's [NCI] study from 1990, cancer in populations living near nuclear facilities, and they're finding that there is, quote, No evidence that an excess occurrence of cancer has resulted from living near nuclear facilities. And, in fact, the NCI study from 1990 has been broadly recognized as discredited and flawed, and in part it's because it looks at cancer mortality. And I think we've all been touched, I'm sure, by cancer within our families or friends. And I think it's pretty common knowledge to know that, particularly in a death registry, the cause of death does not always reflect from cancer from people who've been suffering from cancer. (**0008-10-1** [Gunter, Paul])

Comment: [T]he U.S. Nuclear Regulatory Commission is now, at least as of October of 2009, took it upon itself to update this study [1990 National Cancer Institute Cancer Study] and -- initially NRC went out to the Oak Ridge Association of Universities and a sole-source contract, and in fact that raised enough questions and concern about conflict of interest that the NRC has, in fact, dropped that ... bid. And from congressional interests, the NRC has now gone to the National Academies of Science who are now embarking upon a three-year study ... (**0008-10-2** [Gunter, Paul])

Comment: [T]he NRC has now gone to the National Academies of Science who are now embarking upon a three-year study on the incidence of not just cancer, but other diseases around nuclear power plants. So, again, I'm raising this as a concern that I believe that the current DEIS is an oversimplification. It's premature, and in part, based upon flawed data. (**0008-10-3** [Gunter, Paul])

Comment: Studies of the three most serious radiological events -- the two reactor accidents, one at Three Mile Island and at Chernobyl, and the atomic bombings of Japan -- have shown that the incidence of cancer is far less than the public has been led to believe. (**0007-9-6** [Meadow, Norman])

Comment: Three Mile Island caused no cancer. Chernobyl, less than the press often implies. And the atomic bombings, a surprisingly small amount. It's also important to mention that the Japanese studies have detected no inherited genetic anomalies among the children of the people who were exposed to the bomb blasts. It's important to note that these Japanese studies are also organized by the Japanese. The DEIS should contain a synopsis of the findings of this lifespan study in Japan, including the latest data on disease incidents and the lack of congenital disease, because these data compensate for the detached, impersonal and technical characteristics of the risk projections made from assumed doses that are contained in Chapter 5 of the EIS. (**0007-9-7** [Meadow, Norman])

Comment: Our comment is that the study by Jablon, et al., cited by the authors of the dEIS, offers substantive evidence that nuclear power reactors and other DOE [U.S. Department of Energy] facilities have not affected the health of members of the public living near the facilities. This study, although somewhat weakened by the fact that it measured death from cancer and not the incidence of cancer, included an extremely large population, 52 million, and tabulated 2.6 million cancer deaths. It seems very unlikely that the putative inaccuracies in death certificates and/or other confounding factors would have precisely negated increases in cancer incidence around all of the 62 nuclear facilities, which included some of the most criticized DOE facilities. (**0006-1-2** [Meadow, Norman])

Comment: The challenge by Norm Meadow on behalf of MCC [Maryland Conservation Council] must be responded to (see their website). He concludes there is no real harm from radiation from nuke units, nuke wastes, nor even from atomic bombs. Statistics of radiation effects on life (particularly human) is a vast field I cannot pretend to speak to. Seems like I see many reports countering his conclusions; there must be some expert somewhere we can turn to. Seems like MCC's conclusions should be specifically addressed, so weighty seems his testimony. (**0002-1-3** [Johnston, Bill])

Comment: [I]t's too much burden on the water supply for Calvert County. I know that in Cove Point Beach where I reside, there's a lot of cancer deaths. As a matter of fact in the past five years, there's probably about five deaths in our community all related to cancer. (**0007-6-3** [Sevilla, June])

Comment: I sit on the Health Advisory Committee in St. Mary's County, and we're -- we just had a health survey we just did, and we do have an increased problem with some cancers in the

St. Mary's County, at least, not necessarily associated with radiation, of course, but we do have some additional risks that have increased that we're going to examine. (**0008-13-3** [Fedders, Roy])

Comment: [W]hen you say radioactivity, that raises a concern about cancer. And of course, radioactivity is the very essence of a nuclear power plant. So, it's natural that there is a concern about whether the radioactivity going on in a very intense and concentrated form at Calvert Cliffs does in any way represent a hazard to the public with respect to causing cancer. There was an article that I came across a couple of years ago in the Baltimore Sun. It was a commentary. It alleged that cancer rates in Calvert County had increased dramatically during the 25 or 30 years or so that the power plant had been in operation. That really caught my attention, because that had to do very directly with a matter of great concern to me. When I read that article I immediately went back and reviewed all the vital records for Calvert County. They are on file with the Department of Health and now Hygiene, looking particularly at the incidence of cancer mortality during the period in which the plant has been in operation. It was apparent to me that the commentary which appeared in the Baltimore Sun a couple of years ago was flat-out wrong. The statistics they quoted came from I know not where. I imagine out of their imagination. But the vital records of the State of Maryland do show that the incidence of cancer in Calvert County has not changed significantly during the period of time which the plant has been in operation. The gross rate of cancer mortality is in the range of around 170 deaths per year per hundred thousand population. That figure has remained essentially unchanged since the late Seventies, through the Eighties, through the Nineties and right up to the present time, and that rate is a little bit below the rate for the State of Maryland which ranges more or less in the 180 per hundred thousand per year. (**0008-8-1** [Rogers, David])

Comment: I'm also a resident nearby to the plant. I live in Lusby. I certainly have no qualms about the presence of the plant from a health perspective. I just want to get into the record that in spite of what people may think or may say or may imagine, there is no evidence that cancer rates have changed in any way whatsoever significantly over the period that the plant has been operating. (**0008-8-3** [Rogers, David])

Response: *These comments concern potential human health effects such as cancer from radiation exposure. As stated in Section 5.9.3.2, "… at the request of the U.S. Congress, the National Cancer Institute (NCI) conducted a study and published, Cancer in Populations Living Near Nuclear Facilities, in 1990 (Jablon et al. 1990). This report included an evaluation of health statistics around all nuclear power plants as well as several other nuclear fuel cycle facilities in operation in the United States in 1981 and found '… no evidence that an excess occurrence of cancer has resulted from living near nuclear facilities.'" The NRC has asked the National Academy of Sciences (NAS) to update this study to include data that has been gathered since 1990. The NRC also asked NAS to make adjustments to the study to address some of the limitations of the 1990 study such as use of countrywide data. Also, the 1990 study addressed mortality data; the updated study will also address cancer incidence data.*

There have been many studies of radiation health effects, such as the studies in Hiroshima and Nagaski, Japan, and the EIS cannot summarize all of them. The American Cancer Society has concluded that although reports about cancer case clusters in such communities have raised *public concern, studies show that clusters do not occur more often near nuclear plants than they do by chance elsewhere in the population. Other epidemiological studies have not shown conclusive evidence of increased incidences of cancer at the low dose rates typical of nuclear power plant operations. Further, routine releases from operating nuclear power plants are far below the level at which regional excess cancer incidences would be expected. These studies include: (1) the University of Pittsburgh study (Talbott et al. 2003) that found no link between radiation released during the 1979 accident at the Three-Mile Island nuclear power station and cancer deaths among residents, and (2) the Connecticut Academy of Sciences and Engineering study (2000) that found no meaningful associations from exposures to radionuclides around the Connecticut Yankee nuclear power plant that ceased electricity production in 1996 to the cancers studied. In addition, the NRC constantly monitors publications about new studies of radiation health effects to ensure that the radiation dose standards are set properly. No changes to the EIS were made as a result of these comments.*

Comment: Section 5.9. Since Federal radiation limits are stated in terms of radiation dose, UniStar focused on radiation dose when determining additional radiological impact. UniStar rightly uses the maximally exposed individual (MEI) as a "worst case scenario" when estimating impact. However, the lack of information on radiation concentrations that were used as a basis for dose projections precludes a "gut check" of radiological impact. The document should include an example calculation of dose using the inputs described for at least one of the computer models referenced. (**0003-1-25** [Gray, Susan])

Response: *This comment relates to the radiation dose calculation methods used in the EIS. Section 5.9 of the EIS discusses radiological impacts on the public during operation of the plant. Details of the staff independent dose assessment are provided as Appendix G, Supporting Documentation on Radiological Dose Assessment. The NRC staff used the LADTAP II and GASPAR II computer codes to estimate doses. These codes use the dose assessment approach specified in Regulatory Guide 1.109 (NRC 1977). No change to the EIS was made as a result of this comment.*

Comment: Page 5-64, line 9. Sentence should clarify that 1754 person-rem is the maximum dose at which zero excess health effects are probable. Also clarify whether 1754 person-rem is an annual value. (**0003-1-27** [Gray, Susan])

Response: *The comment relates to the use of International Commission on Radiological Protection (ICRP) guidance to assess radiation health effects. First, the NRC uses the linear no-threshold dose response relationship as recommended by the National Council on Radiation Protection and Measurements (NCRP) and ICRP. The additional guidance regarding a dose below 1754 person-rem was not intended as a definitive limit by ICRP (ICRP 2007). ICRP was simply making the point that population doses of the magnitude estimated by UniStar and the NRC staff for proposed Unit 3 (roughly 5 person-rem/yr or 200 person-rem over the 40-year operating license) most likely would result in zero excess health effects. In addition, the guidance presents 1754 person-rem as a dose, not a dose rate per year. The NRC staff concludes the discussion of health effects in Section 5.9.3.2 is adequate. No change to the EIS was made as a result of this comment.*

Comment: Section 5.9. Inadvertent discharge of effluent to groundwater within the CCNPP property and its possible resulting migration out of the property to drinking water wells appears not to have been addressed. An analysis of groundwater migration patterns should be included in the Final EIS. (**0003-1-26** [Gray, Susan])

Comment: [T]here's one critical area that is missing from the current exposure pathway. And you can't see it here because it's too small, but look at Figure 5-1 which identifies exposure pathways to man. And it shows a dotted line coming from the nuclear power plant, which in fact is a liquid effluent discharge pipe. You should know that right now a major controversy is going on within the Nuclear Regulatory Commission and the nuclear industry right now over the loss of integrity of these pipes. A nuclear power plant can have anywhere from two to 18 miles of pipe. I'm not sure what the particular design for the EPR will be, but clearly a large network, and as many as 50 systems of buried pipe carrying radioactive effluent are now subject to this-- this broad controversy. (**0008-10-4** [Gunter, Paul])

Comment: This particular DEIS in identifying the exposure pathway doesn't identify the fact that there are, in fact, groundwater contaminations occurring at the majority of U.S. nuclear power plants right now. And, in fact, you need only look at the NRC's own diagram from its ground contamination fact sheet which shows a buried pipe and it does show an exposure pathway to groundwater. (**0008-10-5** [Gunter, Paul])

Comment: I think that this particular DEIS is flawed fundamentally because it has not reflected all of the environmental exposure pathways. (**0008-10-6** [Gunter, Paul])

Comment: The drainage patterns in CCNPP property where this fault line traverses on the south side, would not require an earthquake for the radioactive and non-radioactive effluents to leak into the aquifers that supply public drinking water, which is within the scope of the DEIS. (**0012-1-5** [Sevilla, June])

Comment: Even *without an earthquake* (emphasis added), irreversible damage to the state's water supplies will occur through cooling water irradiation contamination, because of the fractures in the soil, even if just a slight shift of the soil foundation beneath CCNPP were to occur, considering the drainage patterns. (**0012-1-6** [Sevilla, June])

Comment: Recently the leakage or the discharge of tritium from nuclear power operations has raised concern at the NRC, however it appears the DEIS does not have any discussion on the potential sources, impact and protective measures to avoid or minimize leaks or discharges. (**0009-1-5** [Magerr, Kevin])

Comment: The other thing to know about nuclear energy is that this radioactive material that people talk about, yes, it's very concentrated and is maintained in very tight containers in use. Occasionally people can measure a certain amount of radioactivity outside the plant and they will make it real scary-sounding and say, wow, there's a million picocuries of tritium found. A picocurie, for those of you who don't understand is one times ten to the minus 12th. That's the decimal point run down 12 zeros later you'll find a one. So, a million picocuries is only one millionth of a curie. There is a leak at a plant up in Vermont which raised lots of publicity for those people who are desperate to shut down that plant so they can power their facilities with natural gas because selling natural gas makes a lot of money. That whole effort was about an amount of tritium which was -- take an aspirin tablet and split it into 3850 pieces. That's how much tritium leaked out of the plant. But that made the press, lots of professionals who are opposed to nuclear energy, made a big deal of it. So, when you hear people talk about their fears, listen to the police officer who measures these things, listen to people who tell you that things are either large or small, and some things are so small that they are almost not measurable. But, since they are radioactive, they are measurable at such tiny amounts that people use them in tracers in medical diagnostics procedures. Yes, measurable. Dangerous, no. (**0008-27-2** [Adams, Rod])

Response: *These comments concern possible leakage of radioactive material into the groundwater. Section 5.9.1 has been revised to address this issue.*

Comment: [W]e are the hazardous materials response team for Calvert County. We are firefighters, EMT's, paramedics. We are the operational wing and the boots on the ground for Dr. Rogers in many respects, for Bobby Fenwick in many respects, and for other folks who have come before you tonight. We want to rise in support of this plant proposal for Reactor 3, but more importantly, I've been at each of the hearings throughout the state and hearings prior to this, and I'd like to emphasize to the folks here, both citizens and others around, it is part of our duties here as a HAZMAT team, we continuously do air monitoring, air monitoring for all kinds of things, but including radiation. We do that all over Calvert County. Whenever we set up for anything, somebody dumps a bunch of gasoline on the ground, we set up radiological air monitoring, because that radiological equipment is embedded in our other stuff. And when we set up for that, we've never gotten any reading above background anywhere in Calvert County in all the years that we've been doing that sample. ... It's important for you to know that we're not part of the nuclear plant. We're not part of anybody's agenda. We're police officers and firefighters and HAZMAT technicians that are independently out there with equipment looking for radiation, and it's just not there. (**0008-18-1** [Thomas, Richard])

Comment: Section 5.9.6. Note that PPRP [Maryland Power Plant Research Program] also conducts independent radiological monitoring of the environment around CCNPP and provides MEI dose estimates (e.g., Jones, T.S., B.H. Hood. 2010. Environmental Radionuclide Concentrations in the Vicinity of the Calvert Cliffs Nuclear Power Plant and the Peach Bottom Atomic Power Station: 2006-2007. PPRP-R-31. June 2010. Maryland Department of Natural Resources, Power Plant Research Program, Annapolis, MD.) (**0003-1-28** [Gray, Susan])

Response: *Section 5.9.6 of the EIS describes the NRC-required radiological environmental monitoring program (REMP) that has been in place for CCNPP Units 1 and 2 since 1974. This section was revised to indicate that radiological monitoring also is performed in the area around the Calvert Cliffs site by the Maryland Department of Natural Resources' Power Plant Research Program. Per the information provided by the Calvert County Sheriff's Department in comment 0008-18-1 above, monitoring is also conducted by the Calvert County HAZMAT team.*

Comment: I understand they have some cooling ponds for the water that's very hot. I know with radiation, perhaps it could attach to the water molecules. The water molecules evaporate, as you know, through natural evaporation process into the air, and with the radiation attached to that there may be a potential for reduced amount of radioactive rain, but certainly some of that could be of concern. (**0008-13-5** [Fedders, Roy])

Response: *This comment concerns the possibility of radioactive material being present in cooling ponds at the Calvert Cliffs site. The radioactive liquid waste system that would be used for the proposed Calvert Cliffs Unit 3 reactor is described in detail in Section 11.2 of the EPR reactor design control document. Radioactive liquid wastes are stored in closed tanks. The system does not include storage of liquid waste in ponds. All releases to the environment from the liquid waste system are controlled and monitored to ensure that releases of radioactive materials and consequences of those releases are within regulatory limits. The proposed design includes basins containing the water for the reactor circulating water supply system and for the ESWS (see Section 3.4 of the ER). The water in these basins is thermally hot (warm) but does not contain radioactive liquid wastes. No change to the EIS was made as a result of this comment.*

E.2.18 Comments Concerning Accidents – Design Basis

Comment: In the draft Environmental Impact Statement, the NRC staff considered the radiological consequences on the environment of potential accidents at proposed Unit 3. The draft EIS reemphasizes that additional measures are designed to mitigate the consequences of failures in the first line of defense. Also outlined by the draft statement is the fact that numerous features combined to reduce the risk associated with accidents at nuclear power plants. Safety features in the design, construction and operation of plants, which compose the first line of defense are intended to prevent the relative -- the release of radiation -- radioactive materials from the plant. Design objectives and the measures for keeping levels of radioactive materials in effluents to unrestricted areas are specified by federal law. These measures include the NRC's Reactor Site Criteria which require the site to have certain characteristics that reduce the risk to the public and the environment. (**0008-15-2** [Fenwick, Bobby])

Response: *This comment supports the information in the EIS related to the environmental impacts of postulated accidents. No change to the EIS was made as a result of this comment.*

E.2.19 Comments Concerning the Uranium Fuel Cycle

Comment: [H]ow long are we contemplating keeping this nuclear waste alive for people to have to worry about? Well, a million years is about 25 times 40,000 years. 25 times since the Neanderthals died out. That's how long we're asking our children to take care of this waste. We have no plans for this waste. We need it so bad. (**0007-13-2** [Johnston, Bill])

Comment: Seems like one cumulative question is how radioactive might the world be in 5,000, 50,000 and 5000,000 years if each and every banana republic now considering nuclear power follows through with its plans, that is, what can be expected long term as to the liveability of the planet. The federal requirement for planning re wastes I believed was 1 million years? Some such perspective is only fair and proper, in fact badly needed for public consideration? Or is there no chance of human survival that long, so the issue is moot and need not be considered? (**0002-1-6** [Johnston, Bill])

Comment: One of the concerns that we have in particular with the Draft EIS, is that it's in error because it does not address the passage of more than five decades without a scientifically-accepted solution for nuclear waste management. (**0007-8-4** [Gunter, Paul])

Comment: Another ... potential problem, a huge environmental problem would be finding out that the nuclear waste that's sitting in big tanks of liquid outside nuclear power plants are leaking or causing a problem. According to a recent article in the Washington Post, this is already happening at a power plant in New Jersey that was built about the same time as Calvert Cliffs 1 or 2. It could be happening here next. The fact is, and it has to be considered an environmental impact, is that there is no plan for long-term storage. What's happening now here at Calvert Cliffs for storage, what's happening everywhere in the country, is simply there is no plan. The way that it's being stored was designed to be temporary, and I haven't seen any new information from Calvert Cliffs 3 saying, well, we have a new system for storage and it's going to be permanent. It's going to be there forever until the U.S. Government assumes ownership of that. That, so far, hasn't happened. So, again, the possibility of environmental disaster there is huge and should the Government, United States Government find a facility and say, okay, we can transport it there, imagine the potential disaster for that. (**0008-24-8** [Peil, Cynthia])

Comment: One of the particulars I think that we wanted to go into for just a few minutes is that now after decades of focus and billions of dollars on what to do with this radioactive waste, we're now basically with the cancellation of Yucca Mountain, going back to square one and there is really no confidence in how we're going to be managing the nuclear waste generated either by Calvert Cliffs 1 and 2, let alone this next generation, but clearly there's been a significant loss in confidence of the long-term management. (**0007-8-3** [Gunter, Paul])

Comment: The [Southern Maryland] Consortium [of African American Community Organizations] had three concerns, [jobs, contract opportunities (addressed in a separate comment)] and the environmental impact, specifically but not limited to storage of the nuclear waste. (**0008-6-3** [Spencer, Doris])

Response: *These comments concern the issue of disposal of spent fuel and other high-level radioactive wastes. Section 5.9 of this EIS addresses the radiological impacts of proposed Unit 3 during operation including the storage of spent fuel in the spent fuel pool and in the ISFSI at CCNPP Units 1 and 2. Interim storage and ultimate disposal of spent fuel and high-level radioactive waste are discussed in Section 6.1.6 of the EIS. Section 6.1.6 presents Yucca Mountain as an example of a possible high-level waste repository; the conclusions in Section 6.1.6 do not depend on whether Yucca Mountain, or another site, is ultimately the destination for spent fuel and high-level radioactive waste. Moreover, as indicated at 10 CFR 51.23(a), "The Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years* *beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and at either onsite or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent fuel generated in any reactor when necessary.'' In addition, 10 CFR 51.23(b) applies the generic determination in section 51.23(a) to provide that "no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installations (ISFSI) for the period following the term of the . . . reactor combined license or amendment . . .is required in any . . . environmental impact statement . . . prepared in connection with . . . the issuance or amendment of a combined license for a nuclear power reactors under parts 52 or 54 of this chapter." Section 6.1.6 of the EIS has been revised to address this issue.*

Comment: And in particular with this particular design for the evolutionary power reactor, we now have this concern that this particular design, again, which is not approved or has not completed its certification process, plans to use high-burnup fuel. And we'll be submitting more extensive comments on the issue of how the EIS fails to address this. But basically as the result of economic pressures, EDF, which is one of the co-partners with Constellation and UniStar, has developed this optimization plan that seeks to decrease its nuclear operating costs by increasing the EPR design power output by 15 percent by enriching the EPR fuel into the range of 4.5 to 4.9 uranium-235 and by discharging the irradiated fuel at a burnup in excess of 60,000 megawatt days per ton of uranium. So, in effect, we've got an EIS now that's moving forward without really addressing the fact that this high-burnup fuel will stay in the reactor longer, that the nuclear waste generated by high-burnup fuel will be thermally hotter and significantly more radioactive, and it will require longer periods of time to cool down and greater shielding from its intense radioactivity. In fact, this high burnup issue will affect the issue of nuclear waste handling in the fuel pool at the reactor, on the independent storage site itself for indefinite interim storage, transportation and ultimately whatever final resolution is out there, which right now is an unknown. So, every stage of handling on site, particularly high burnup fuel, raises some very, very significant environmental issues which we don't think are adequately addressed in this particular EIS statement. (**0007-8-5** [Gunter, Paul])

Response: *The comment concerns the use of high-burnup fuel in the proposed reactor design. The use of high-burnup fuel is not unique to the EPR design; use of fuel with higher enrichments and higher allowable burnups has been approved by the NRC for many currently operating nuclear power plants. In the "Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors" (NUREG/CR-5009), NRC evaluated the environmental effects of using higher burnup fuel than assumed in Table S–3 (NRC 1988). The NUREG concluded the burnup increase would have no significant environmental impact over the burnup levels assumed in Table S–3. Based on conclusions in NUREG/CR-5009, NUREG-1437 (NRC 1996, 1999a[(a)]) concluded that fuel burnup levels up to 60 GWd/MTU will not result in environmental impacts that are greater than the values currently in Tables S–3 and S–4. NUREG/CR-6703, In*

(a) NUREG-1437 was originally issued in 1996. Addendum 1 to NUREG-1437 was issued in 1999. Hereafter, all references to NUREG-1437 include NUREG-1437 and its Addendum 1.

Environmental Effects of Extending Fuel Burnup Above 60 GWd/MTU (NUREG/CR 6703), the NRC further concluded there are no significant environmental impacts associated with extending peak-rod burnup to 62 GWd/MTU (NRC 2000). No change to the EIS was made as a result of this comment.

Comment: I would suggest that these true impacts of nuclear, including the uranium mining and all associated activities, as well as the waste that's created, you can't truly assess the impact of this technology without the inclusion of these activities, and I'd like to see them included in the final EIS. (**0008-7-7** [Fisher, Allison])

Response: *The comment concerns the environmental impacts of the nuclear fuel cycle. Section 6.1 of the EIS addresses the uranium fuel cycle, which is defined as the total of those operations and processes associated with provision, use, and ultimate disposition of fuel for nuclear power reactors. As stated in Section 6.1, 10 CFR 51 requires that "… every environmental report prepared for the construction permit stage or early site permit stage or combined license stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S–3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes (LLW) and high-level wastes related to uranium fuel cycle activities to the environmental costs of licensing the nuclear power reactor." See Table 6-1 for the uranium fuel cycle environmental data. No change to the EIS was made as a result of this comment.*

E.2.20 Comments Concerning the Need for Power

Comment: I would also say is that in Section 8.5 they talk about the demand for power. Our country is going to need 28 percent increase in power by 2035 according to the Energy Information Administration. This is based on a historically low growth rate, although our population is growing and our love of electronic devices is growing right along with it. So, we are going to need new energy sources. (**0007-11-3** [Kass, Leslie])

Comment: I personally believe that it's going to take everything we have to meet that demand, as well as transition to a clean energy economy, because some of our older units that are not environmentally compliant, we're just not going to be able to run anymore. And so we're going to have to replace those. (**0007-11-4** [Kass, Leslie])

Comment: And as the environmental requirements and the requirements for low-carbon emissions come along, we don't have that many choices and we need to develop them all. What nuclear offers is 24/7 90 percent capacity factor baseload power that supports our industry, our economy and our way of life here in Maryland. And we will certainly be part of this demand growth as our area, fortunately, continues to recover and hopefully thrive again. (**0007-11-5** [Kass, Leslie])

Comment: CASEnergy supports NRC's conclusion that there is a shortage of power in Maryland, and Unit 3 at Calvert Cliffs can help address the increase in demand. (**0007-12-1** [Lamboley, Genny])

Comment: The SBA [Solomons Business Association] supports the findings of the Draft Environmental Impact Statement which demonstrates a need for new energy supply in the State of Maryland. (**0007-14-2** [Simpson, Lauren])

Comment: The reality is that [as] Maryland and the nation continue ... to grow, we will require more power from a variety of sources in the years ahead. (**0007-18-11** [Pennoyer, Gordon])

Comment: A third reactor at Calvert Cliffs will help address energy needs in Maryland by adding 1600 megawatts of clean, non-greenhouse gas-emitting generating capacity. Enough to power 1.3 million homes. Additionally, adding more power will help to improve grid reliability and help to bring stability to power prices in our region. (**0007-18-3** [Pennoyer, Gordon])

Comment: A third new reactor at Calvert Cliffs will address the energy needs in Maryland by adding approximately 1600 megawatts of clean, non-greenhouse gas-emitting generating capacity, enough to power 1.3 million homes. (**0007-22-2** [Kennedy, Sherri])

Comment: As you know, energy demand continues to grow. Existing generation plants are getting older and Maryland is in a critical energy supply situation and we need new energy infrastructure investment in the near term. The U.S. Department of Energy categorizes Maryland as a critical congestion area, an area where it is critically important to remedy existing or growing congestion problems because current or projected effects of the congestion are severe. As a state that ranks 5th as the nation's largest energy importer, importing 25 percent of its energy needs, we need to rethink our energy strategy. Therefore, the [Calvert County] Board [of County Commissioners] supports affirmation of NRC findings that there is a justified need for new baseload generating capacity in Maryland in excess of the planned output of proposed Unit 3. (**0008-1-4** [Parran, Wilson])

Comment: A third new reactor at Calvert Cliffs will help address those varying energy needs in Maryland by addressing -- adding 1600 megawatts of clean, non-greenhouse-gas-emitting generating capacity, enough to power 1.3 million homes, who knows how many iPods and iPhones. Additionally, adding more power will help to improve grid reliability and to help bring stability to power prices in our region. (**0008-12-2** [Pennoyer, Gordon])

Comment: According to the Department of Energy, the U.S. demand for electricity will rise more than 25 percent by 2030. This means that our nation will need hundreds of new power plants to provide electricity for our homes and continued economic growth. (**0008-17-3** [Green, Bonnie])

Comment: This project will also have a positive impact on our region's energy supply. The draft EIS supports the need for future energy supply, demonstrating a need in the mid-Atlantic for more baseload generating power, power that is available 24 hours a day, seven days a week. Because Calvert Cliffs currently generates approximately 25 percent of the state's electricity, adding a third 1600 megawatt reactor would significantly increase energy supply, making the region and the state more competitive and thus reducing our need to rely on imported power. Therefore, we [Charles County Board of County Commissioners] support the findings of the draft EIS regarding energy demand and the need to generate more power in the state. (**0008-2-5** [Hodge, Gary])

Comment: The Maryland Public Service Commission analyzed our needs for power in a 2007 report and, in its 2009 order, granted a certificate of public convenience and necessity to UniStar for the proposed Unit 3. (**0008-3-3** [Clark, Jerry])

Comment: [I]ncreasing Maryland's nuclear generating capacity will provide a cushion against future shortages and energy price fluctuations. (**0008-3-5** [Clark, Jerry])

Comment: I could not agree more with what the [county] Commissioners have said about the demand for power here in Maryland, and our need to have clean energy resources, so we protect the environment for our children and our families and also the economy, with low-cost sources, as we move forward. By the year 2035 there's an estimate from the Energy Information Administration, increase in demand for power of 28 percent, so the need for this plant is present and coming, as we all grow our population, as well as our love of electronic devices. (**0008-5-1** [Kass, Leslie])

Response: *These comments support the discussion in Chapter 8 of the EIS. No changes to the EIS were made as a result of these comments.*

Comment: It is estimated that the United States will need upward of 25 percent more electric generating capacity by the year 2030. And nuclear energy gives us a way to meet that need while reducing both greenhouse gas emissions and our dependence on foreign oil. (**0008-20-1** [Graham, Chuck])

Response: *This comment supports the discussion in Chapter 8 and Section 9.2.5 of the EIS. No change to the EIS was made as a result of this comment.*

Comment: I also just want to mention real quickly under the Need for Power Section where it talks a lot about what Maryland's need for power is, well, let's remember this is a merchant plant proposal. There is no guarantee that any electricity produced by Calvert Cliffs 3 will ever be sold in the State of Maryland. It has no customers in the State of Maryland. None. And if the prices of the electricity that can be projected from this plant occur, it's very unlikely the Maryland Public Service Commission is ever going to allow Baltimore Gas and Electric to buy power from this thing. (**0007-5-6** [Mariotte, Michael])

Comment: I find the basic framework of the analysis and the section flawed. First and foremost the entire analysis is based on the need for power section. I believe that's Chapter 7 or 8. This section assumes two things. One, that Maryland needs power. Fair enough. And, two, that it will be filled by the power generated from a nuclear reactor. The reason why I disagree with this framework and why I find that problematic is because there's no information within the EIS that provides the power purchase agreement or other notes of commitment by UniStar that its power will serve Maryland. In fact, it's going to be constructed as a merchant plant. The power generated will go into the wholesale market and likely will supply utilities up in the north where they can get the best price for it. (**0008-7-2** [Fisher, Allison])

Response: *As noted in Section 8.0 of the EIS, the NRC has acknowledged the primacy of State regulatory decisions regarding future energy options. The findings by the Maryland Public Service Commission discussed in Sections 8.4.1 of the EIS specifically state that the proposed Unit 3 would benefit the citizens and the State of Maryland. No changes to the EIS were made as a result of these comments.*

Comment: What is the rush? There is no rush for power right at the moment. (**0007-13-5** [Johnston, Bill])

Response: *The staff's assessment of need for power in Section 8.4 of the EIS reflects recent reports and determinations that found there would be a need for power by the time Unit 3 would be built and operating. No change to the EIS was made as a result of this comment.*

Comment: in Section 8 there's the need for power. This section is outdated. It relies heavily on a 2007 Maryland Public Service Commission Report which did in fact find that Maryland is going to need more power, but that was 2007. And if you haven't noticed, we've been in a recession since then. And instead of the projected increases in demand that that report predicted, we have had decreases in electrical demand. There's no discussion in this EIS of how quickly the demand is expected to come back, when will we even reach where we were, much less project out into the future as to when we will need more power. The report does state that Maryland's growth rate even then, electrical demand and growth even then was below the national average. Well below the national average. It may be some time before we see the kinds of demand needs that were being projected back in 2007. So, this clearly needs to be updated. (**0007-5-4** [Mariotte, Michael])

Response: *The discussion in Section 8.4 of the EIS reflects the Maryland Public Service Commission's (MPSC) 2009 decision to grant a CPCN for proposed Unit 3 and ReliabilityFirst Corporation's (RFC) 2009 reserve margin projections. Since the publication of the draft EIS in April 2010, several reports have been issued that update information discussed in Chapter 8. The staff's assessment of these recent reports has been added to Section 8.5 of the EIS.*

Comment: Section 8.0, Page 8-5; and Section 10.6, Page 10-21. The DEIS relies on a variety of sources to assess the need for power, including testimony from PSC [Public Service Commission] Staff presented in PSC Case No. 9127 concerning the CPCN [Certificate of Public Convenience and Necessity] for Calvert Cliffs Unit 3. While the PSC is charged with addressing impacts to reliability and stability of the electric system in Maryland as part of a CPCN proceeding, it should be noted that any explicit cost/benefit assessment of the need for power and the cost of alternatives is no longer an integral part of the CPCN licensing scope. The statement on lines 10-11 of page 8-5 in the DEIS is no longer accurate: "As part of this licensing process, applicants must address a full range of environmental, engineering, socioeconomic, planning, and cost issues (MDNR PPRP 2007)." The aforementioned reference is not up to date, and we request that the citation be removed from the DEIS. An up-to-date description of the licensing scope and process is included in Chapter 1 of the PPRP [Maryland Power Plant Research Program] document Maryland Power Plants and the Environment (CEIR-15), which is available here: http://esm.versar.com/pprp/ceir15/intro.htm. In addition, the Conclusions section on the Need for Power (page 10-21) states that the NRC relied upon PSC determinations (including the issuance of the CCU3 CPCN) as the basis for NRC's assessment that power is needed. Because the CPCN process does not rely on a "need for power" demonstration as a prerequisite for certification, the paragraph on page 10-21 should be revised. The NRC should also be aware that updated information from the PSC on supply and demand forecasts in Maryland is available in the recently released document Ten-Year Plan (2009-2018) of Electric Companies in Maryland, which is available here: http://webapp.psc.state.md.us/Intranet/Reports/2009-2018%20Ten%20Year%20Plan.pdf. (**0003-1-33** [Gray, Susan])

Response: *Section 8.4.1 of the EIS was modified to reflect this comment, and reference to the MDNR PPRP (2007) document was removed from Section 8.6 of the EIS. Section 8.4.1 of the EIS notes that during the CPCN proceeding, Mr. Craig Taborsky of the MPSC staff testified that Maryland may face a shortage of electricity in coming years, perhaps by the year 2011 or 2012. Section 8.4.1 also notes that the MPSC determined in the CPCN proceeding that the proposed Unit 3 would be a welcome source of baseload power that would be of benefit to the citizens and State of Maryland. Chapter 8 of the EIS was revised to reflect the 2009 to 2018 version of the Ten Year Plan of Electric Companies in Maryland. Section 10.6.1.1 of the EIS was revised to reflect that the NRC staff relied on the MPSC's 2007 and 2009 determinations and the RFC projection discussed in Section 8.4.3 of the EIS to reach its conclusion that there is a need for baseload power from the proposed Unit 3 at the Calvert Cliffs site.*

Comment: I've come to ... recognize that we must find ways to meet our region's burgeoning electricity demand. The expansion of Calvert Cliffs will help fulfill this crucial need with clean, affordable power. I also believe it will be a showcase to highlight the state's responsible stewardship of the environment and its commitment to meet the electricity needs of its businesses and citizens. (**0015-1-4** [Wolfley, Terri])

Response: *This comment supports the discussion in the EIS. No change to the EIS was made as a result of this comment.*

E.2.21 Comments Concerning Alternatives – Energy

Comment: [T]he amount of carbon dioxide that would be put into the air by a fossil fuel plant of similar size could be equivalent to having about 1.6 million vehicles, extra vehicles on the road in Southern Maryland. Not only that, but coal-burning plants, I recently found out actually release more radiation by a factor of ... up to 100 times of what is released from a nuclear plant. This is due to the naturally-occurring uranium and thorium found in coal which, once you burn away all the coal is -- becomes really concentrated and just becomes released into the air as fly ash, compared to the radiation sources that are released from a power plant which are carefully contained and stored and not released into the atmosphere. (**0008-14-2** [Meraz, Christopher])

Comment: For a coal plant to produce the same amount of energy, it would need to burn 4.5 million tons of coal per year. Producing the same energy at Calvert Cliffs 3 would be the equivalent of removing 1.6 million passenger cars from our roads. (**0007-23-6** [Martin, Kendall])

Response: *These comments generally support the discussion in Section 9.2.2.1 of the EIS. No change to the EIS was made as a result of these comments.*

Comment: [W]e [North American Young Generation of Nuclear] feel that it's the environmentally best choice. I'll tell you that if you look around at young professionals in the nuclear field and you scratch under the surface, you'll find that many of us actually consider ourselves to be environmentalists in one way, shape or form, and we care very deeply about issues such as global warming and the fact that nuclear power is non-greenhouse-gas-emitting, means that it is the clear choice for us. (**0008-23-4** [Robinson, Duncan])

Response: *This comment supports the discussion in Section 9.2.5 of the EIS. No change to the EIS was made as a result of this comment.*

Comment: [N]uclear energy required less land area than comparable renewable sources such as solar, which is a great technology. It's come a long way. Wind power, also wonderful technology, but as far as the land areas that it would require to generate a similar amount of electricity, there's just no comparison in my mind for an environmental impact. (**0008-14-3** [Meraz, Christopher])

Response: *This comment supports the discussion in Sections 4.1.1, 9.2.3.2, and 9.2.3.3 of the EIS. No change to the EIS was made as a result of this comment.*

Comment: While environmentalists have concerns about the use of renewable energy as good ways to expand our energy future, the capability is not there. The fact is, nuclear energy is reliable 24 hours a day, seven days a week, and nuclear generation is the safest and cleanest mechanism to protect our global environment. (**0008-17-5** [Green, Bonnie])

Comment: When the technology for renewable energy catches up, then let's use it, but not now. Until then, we need reliable power to meet our energy demands. Right now, nuclear power is the surest, clean choice. (**0008-21-9** [Allison, Kathleen])

Response: *These comments support the discussion in Section 9.2 of the EIS. No change to the EIS was made as a result of these comments.*

Comment: At this point in time there are a lot of other alternatives that are available. If the Government put the amount of money into alternative energy sources, into conservation, that they are currently considering putting into nuclear power, some of those questions and difficulties will be readily addressed by our engineers that are available, by the students in colleges right now, research could be done and some of those problems could be answered. (**0008-24-3** [Peil, Cynthia])

Response: *Alternative energy sources are discussed in Section 9.2 of the EIS. This comment is speculative, particularly regarding baseload power, and adds no new specific information. This comment also addresses energy policy. The NRC's responsibility is to regulate the nuclear industry to protect the public health and safety within existing policy. The NRC is not involved in establishing or administering energy policy for the United States; that is the role of the Administration, the Congress, and the U.S. Department of Energy. Insofar as an applicant seeks to use radioactive material as a fuel source to provide electrical energy to address the needs of its service area, for example, over a specific period, it must obtain a permit, license, or authorization from the NRC. Before approving such a request and in preparing its EIS, the NRC does evaluate the environmental consequences of taking the action (i.e., issuance of a license to construct and operate an electrical generation facility that uses radioactive material as its fuel source). No change to the EIS was made as a result of this comment.*

Comment: [T]he analysis seems to prioritize traditional baseload alternatives, like coal and gas-fired plants over energy efficiency and a renewable energy as realistic alternatives to nuclear. This is a false assumption as well. The electricity system doesn't rely on any plant's ability to run continuously which is what baseload power means, because no kind of power plant can run all the time. All power plants do fail. In fact, just a few weeks ago one of Calvert Cliffs' reactors automatically shut down for the second time this year. The first was in February when melting snow on a leaky roof triggered an automatic shutdown. Solar cells and wind power's variation with night and weather is no different from the intermittency of nuclear and coal, except that when -- when the wind or the solar goes down, its effects are less capacity. It's briefer. It's far more predictable and it's a little easier to manage. (**0008-7-3** [Fisher, Allison])

Response: *The capacity factors of wind and nuclear plants are discussed in Section 9.2.3.2 of the EIS. The capacity factor for a nuclear plant is significantly higher (91.5 percent) than for a current-generation wind plant (36 percent). Without energy storage, the annual capacity factor of any solar technology is generally limited to about 25 percent (Sandia National Laboratories 2006). No change to the EIS was made as a result of this comment.*

Comment: [T]he staff relies almost solely on the Maryland Public Service Commission Report entitled Electric Supply Adequacy Report of 2007, to determine Maryland's energy resources. The staff does rightly point out that the demand side initiatives in the report, including the EmPower Maryland Efficiency Programs will reduce the need for power significantly, and to also create renewable energy facilities, such as rooftop solar panels. I will also note that these should ensure the reliability of the electricity system through 2025 and within the next five years, these programs will yield as much energy per year as 1.4 new reactors at Calvert Cliffs. What the staff fails to include is other sources that might be useful to demonstrate that there's still significant clean energy resources and efficiency measures that can be tapped in Maryland. For example, according to the American Council for an Energy Efficient Economy [ACEEE], additional efficiency and load management could reduce peak electricity demand for as much as 8,500 megawatts below business as usual levels by 2025. These measures, coupled with additional renewable resources including wind, solar and biomass power could, in fact, help not only meet the demand, but also help us start to retire aging power plants. And moreover -- and this is a point that seems to be very prominent this evening, the ACEEE estimates that going the efficiency course could create more than 12,000 new jobs in Maryland by 2025, and increase net wages paid by 780 billion and grow gross state product by more than 700 million dollars. (**0008-7-4** [Fisher, Allison])

Response: *Section 8.4 of the EIS discusses four sources used to assess the need for power: (1) the 2009 granting of the CPCN by the MPSC (Section 8.4.1), (2) the 2007 MPSC report referred to in the comment (Section 8.4.2), (3) the 2009 RFC report (Section 8.4.3), and (4) the 2008 Maryland Energy Administration (MEA) report (Section 8.4.4). The last paragraph of Section 8.4.1 of the EIS notes that in granting the CPCN, the MPSC rejected arguments that alternative forms of generation and additional conservation should be used in lieu of new nuclear generation. Also, as noted in Section 8.4.2 of the EIS, the MPSC took account of demand-side management and demand response in its 2007 electric supply adequacy report that found a need for power. A recent ACEEE report states that Maryland is rated number 11 out of the 50 States for overall energy efficiency (ACEEE 2009). As noted at page 8-1 of the draft EIS, NRC acknowledges the primacy of State regulatory decisions regarding future energy options. No change to the EIS was made as a result of this comment.*

Comment: [T]he comparative analysis is severely undermined by lack of inclusion of all variables and the proper weighing of these variables. Here's an example. The discussion of coal as an alternative inputs both mining activities, as well as the scrubbers, sludge and ash that's generated from this source. And when looking at the land use and the waste management analysis respectively, the coal source yields a moderate environmental impact. And for those of you not familiar the way that the environmental impact scaling is done is small, moderate and large. So, moderate is what coal yielded, which should mean, all things equal, that uranium mining, milling and enrichment, as well as management of high and low-level radioactive waste that stays very dangerous for hundreds of thousands of years should be considered in this comparative analysis. Yet, the impact finding for nuclear, when compared to coal, for the same categories, both land use and waste management yields a finding of small. And here's how they qualified small. Environmental effects are not detectible or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resources. I couldn't disagree more with that, and I think those that work and live in uranium mining communities would agree with me. (**0008-7-5** [Fisher, Allison])

Response: *The direct land-use impacts for proposed Unit 3 are discussed in Sections 4.1 and 5.1 of the EIS. The land-use impacts associated with the uranium fuel cycle are discussed in Section 6.1.1 of the EIS. The nonradiological waste impacts of proposed Unit 3 are discussed in Sections 4.10 and 5.10 of the EIS. The radiological waste impacts of the uranium fuel cycle are discussed in Section 6.1.6 of the EIS. The land-use and waste-management impacts of a coal-fired plant are discussed in Section 9.2.2.1. The preceding sections provide the justification for the review team's impact characterizations, which are summarized in Table 9-4 of the EIS. Based on this comment, the first paragraph of Section 9.2.5 of the EIS was revised to indicate that the review team's nuclear impact characterizations in Table 9-4 of the EIS reflect the nuclear fuel cycle impacts discussed in Chapter 6 of the EIS.*

Comment: We [Maryland Conservation Council] appreciate the fact that the NRC has included in its draft EIS the fact that, quote, The Maryland Public Service Commission concluded that the economic benefits from renewables remain uncertain and challenging. Onshore wind yields net economic benefits, albeit on a small scale. Offshore wind, as modeled in the report does not yield economic benefits. We would suggest that the final EIS include the quote about nuclear power from the Levitan reports used by the Maryland Public Service Commission, to-wit, The nuclear case provides the highest cumulative economic value-added of all scenarios. New nuclear generating capacity provides a rapid, substantial and sustained benefit to Maryland ratepayers unmatched over the 20-year horizon by any other option. With respect to the economic benefits of nuclear energy over wind and solar energy, these reports clearly state that the economic benefit to the ratepayer is highest with nuclear power generation, saving $2.9 billion by 2027. Next highest with conservation energy efficiency programs, the Governor's EmPower Maryland Program, saving $2.3 billion by 2027 and is only slightly positive with onshore wind facilities, saving $300 million by 2038. And under all circumstances, more expensive to the ratepayer with offshore wind generation in Maryland losing $200 million by 2038, and rooftop solar photovoltaics losing $2.8 billion by 2038. These figures were compared against the current electricity mix that we have operating now. These cost, or loss estimates could change somewhat with relative cost of fuel and other factors, but are illustrative of the current situation. These scenarios offer low penetration wind and solar installations. The American Physical Society notes that with higher penetration wind and solar installations, the cost of maintaining back-up generation power by natural gas and other electricity-generating facilities will add to the cost of electricity. Therefore, wind and solar generation will cost the Maryland ratepayer more than nuclear energy generation by a wide margin, and this will disproportionately negatively impact the low-income and poor. (**0008-19-1** [Meadow, Karen])

Response: *This comment supports the discussion in Section 9.2 of the EIS. The economics of the alternative energy sources identified in Section 9.2.3 of the EIS are not discussed in the EIS because, in accordance with Environmental Standard Review Plan (ESRP) 9.2.3, the review team concluded for each such alternative that it would not be an environmentally preferable alternative to construction of a 1600-MW(e) nuclear power generation facility that would be operated as a baseload plant within UniStar's region of interest. No change to the EIS was made as a result of this comment.*

Comment: When I raised the issue of the Grand Solar Plan, with CAES [compressed air energy] storage to solve the intermittency problem, he [Norm Meadows] asks me where that has been proven and refers to a couple of small sites long in existence. The dEIS makes no effort to recognize the huge recent advances in particularly solar or to be expected within the time Nuke3 might come on line, nor recent reduction/slowing of demand which should give us time to reflect. (**0002-1-5** [Johnston, Bill])

Response: *The review team's assessment of need for power in Section 8.4 of the EIS reflects recent reports and determinations. The review team's discussion of compressed air energy storage (CAES) is in Section 9.2.3.2 of the EIS. Given the fairly limited application of CAES to date for power production, the review team concluded that the use of CAES in conjunction with an intermittent energy source such as wind to generate 1600 MW(e) of baseload power is* *unlikely to meet the need for power. The staff cannot base its conclusions regarding wind and solar energy on speculation about the future advances of energy storage means such as CAES. No change to the EIS was made as a result of this comment.*

Comment: Start with Chapter 9, alternatives. If you go to Pages 9-21, 9-22, you look at wind power. And this is either deliberate deceit or incompetence, but it refers to a study done by Southern Company and Georgia Institute for Technology on wind power potential in Georgia, and somehow relates that to Maryland. (**0007-5-1** [Mariotte, Michael])

Comment: Let's see what the federal government has to say about wind power. Secretary of the Interior, Ken Salazar, April 2009, the idea that wind energy has the potential to replace most of our coal-burning power today is a very real possibility. It is not technology that is pie in the sky. It is here and now. More than three-fourths of the nation's electricity demand comes from coastal states - Maryland is a coastal state - and the wind potential off the coast of the lower 48 states actually exceeds our entire U.S. electricity demand. In a report that same month, the Interior Department said there are 1,000 gigawatts of wind power potential off the Atlantic coast. (**0007-5-2** [Mariotte, Michael])

Comment: But if you look at the wind power potential for Georgia, it is the lowest possible on the Interior Department's scale. If you look at the wind power potential off the coast of Maryland, it is considered outstanding to superb, which are the highest levels of the Interior Department scale. In other words, Maryland has tremendous wind power potential that Georgia does not have. And to cite a Georgia study as evidence of the wind power potential in Maryland is just flat out wrong. Elsewhere in that chapter [Chapter 9] you talk a little bit about solar power. A very little bit about solar power. There's actually a sentence in there that admits that Maryland has really good potential for power from solar photovoltaics, but then there's no effort to quantify that. (**0007-5-3** [Mariotte, Michael])

Comment: And so when you look at what are the possible alternatives to Calvert Cliffs, well, if you think that our wind power alternatives are the same as Georgia, if you don't bother to quantify the solar power alternatives, if you don't bother to figure out what the new energy efficiency laws mean and what the drop in demand means, well, of course you can't figure out alternatives. This whole section is just bogus and needs to be redone. (**0007-5-5** [Mariotte, Michael])

Response: *The review team's evaluations of wind and solar power are in Sections 9.2.3.2 and 9.2.3.3, respectively, of the EIS. According to the National Renewable Energy Laboratory (NREL), Maryland has a somewhat better offshore wind resource than Georgia (Schwartz et al. 2010), which suggests that the 20-year levelized cost of electricity could be less for a wind farm off the coast of Maryland than a comparable wind farm off the coast of Georgia. Nevertheless, the review team believes that conclusions in the Southern/GIT (2007) report (summarized in Section 9.2.3.2) would generally apply to a wind farm located offshore of Maryland, based on similarities in the physical and regulatory environments. The EIS does not cite the Georgia study for the purpose of determining the wind power potential in Maryland. The review team concluded that neither wind nor solar would currently be a reasonable alternative to construction* *of a 1600 MW(e) nuclear generation facility that would be operated as a baseload plant within the region of interest. In each case, the principal reason for the conclusions reached was that it would be very unlikely that sufficient energy storage capacity would be available, given the relatively low capacity factors of wind and solar, to produce 1600 MW(e) of baseload power. The staff's assessment of need for power in Section 8.4 of the EIS reflects recent (2009 and 2010) reports and determinations. Additional text was added to Sections 9.2.3 and 9.2.4 of the EIS to further address wind power.*

Comment: [B]y defining the ROI [region of interest] to be merely the state of Maryland, that rules out any broader alternatives to supplying base load. As [Michael] Marriott pointed out, the evaluation of wind (by reference to poor wind conditions in Georgia) in the dEIS was ludicrous. Solar and wind are ruled out, without any effort at fair comparison. (**0002-1-2** [Johnston, Bill])

Response: *The region of interest was defined by UniStar. As stated in Section 9.3.1.1 of the EIS, the review team concluded that the region of interest used by UniStar was reasonable for consideration and analysis of potential sites. The review team also concluded that UniStar's basis for defining its region of interest did not arbitrarily exclude desirable candidate locations. The review team's evaluations of wind and solar power are in Sections 9.2.3.2 and 9.2.3.3, respectively, of the EIS. The review team concluded that neither wind nor solar would currently be a reasonable alternative to construction of a 1600 MW(e) nuclear generation facility that would be operated as a baseload plant within the region of interest. In each case, the principal reason for the conclusions reached was that it would be very unlikely that sufficient energy storage capacity would be available, given the relatively low capacity factors of wind and solar, to produce 1600 MW(e) of baseload power. No change to the EIS was made as a result of this comment.*

Comment: Illustrative of the relative environmental impacts of renewables and nuclear power, a comparison between a 99 megawatt nameplate wind project in New Hampshire, Granite Reliable Wind Energy Facility, and Calvert Cliffs Number 3, is instructive. The New Hampshire wind facility will produce at most, 33 megawatts of power and destroy 13 acres of wetlands. While Calvert Cliffs Number 3 will produce approximately 1440 megawatts of power, 44 times more, and negatively impact only 12 acres of wetlands. According to the DEIS, UniStar will be mitigating this loss with creation or enhancement of 24.9 acres of wetlands. (**0007-10-4** [Meadow, Karen])

Comment: To many environmental groups renewable energy is a preferable alternative to reactors. To those concerned with the conservation of biological diversity, however, the cumulative ecological impacts of large-scale renewable projects will be their most detrimental effect. A report from the National Research Council, "The Environmental Impacts of Wind-Energy Projects," states repeatedly that the current state of ecological knowledge makes it impossible to forecast what the cumulative impacts of wind installations will be on many creatures, particularly those that are rare. The report's strongest statement is on page 68: "The construction and maintenance of wind-energy facilities alter ecosystem structure through vegetation clearing, soil disruption, and potential for erosion, and this is particularly problematic in areas that are difficult to reclaim such as desert, shrub-steppe, and forested areas." We believe that concern for cumulative ecological impacts of industrial wind installations should be included in the final EIS as a reason for rejecting them as an alternative (as they are for wood waste in section 9.2.3.6) because thousands of turbines will be required to equal the output of the proposed reactor, and these turbines will disturb the ecology of many thousands of acres of forest, if built on land, or even larger marine areas, if built offshore. This would make cumulative impacts of wind installations a key factor in the decision to build the reactor. The report from the National Research Council should be cited in the bibliography of the EIS (National Research Council. Environmental Impacts of Wind-Energy Projects. 2007. The National Academies Press, Washington, DC.). (**0006-1-3** [Meadow, Norman])

Comment: There is a report from a committee of the National Research Council entitled “Environmental Impact of Wind Energy Project”. The report presents a clear and disturbing picture of the potential cumulative impacts of multiple wind energy projects. The [Maryland Conservation Council] suggests that the statements in the National Research Council Report be used to emphasize the weaknesses of wind as an alternative particularly with respect to onshore wind turbine installations. The report states, quote, the construction and maintenance of wind energy facilities alter ecosystem structure through vegetation clearing, soil disruption and potential for erosion. And this is particularly problematic in areas that are difficult to reclaim such as desert, shrub steppes and forested areas. The National Research Council Report states that bird and bat kills from collision with turbines is the lesser source of harm than the ecosystem-altering affects of these large machines. Bird and bat kills are too easily dismissed by comparing them to the larger numbers of animals that are killed by other human contacts, but altering whole ecosystems could be catastrophic. With respect to many types of species, amphibian, reptilian, mammalian, avian, the National Research Council says consistently, and these are quotes, studies of both onshore and offshore wind energy facilities in Europe have reported disturbance effects ranging from 75 meters to as far as 800 meters from turbines for water fowl, shore birds, waders and passerines. Another quote: The lack of quantitative data pertaining to the loss of spruce forest and squirrel habitat at wind energy facilities limits our understanding of the potential impact of wind energy development. Another quote: The lack of quantitative data pertaining to the loss of potential Allegheny Wood Rat habitat in the mid-Atlantic highlands is a data gap in the development of wind energy projects. Another: The relationship between wind energy development and fur-bearer population biology also is unstudied at this time. Quote: It is unclear what, if any, effect this isolation might have on small mammal populations in the mid-Atlantic highlands. The lack of information on the effects of isolation is identified as a data gap in assessment of ecological consequences of wind energy development. Removal of mixed hardwood spruce trees and replacement with gravel roads and tower pads could be detrimental to this species. And that's for Cheat Mountain salamanders. And the last quote: Ecology and natural history of reptiles are poorly studied in forest communities potentially modified by wind energy development in the mid-Atlantic highlands. Alteration of habitat related to wind energy development could influence habitat suitability for this species, but we are unaware of any studies at wind energy developments that have examined these effects. And that's for timber rattlesnakes which are of conservation importance. The [Maryland Conservation Council] suggests that the National Research Council's observations about the paucity of understanding of cumulative impacts of wind installations on biological diversity be incorporated in the final EIS as another reason for rejecting the alternative of wind energy. While the National Research Council does not take into account offshore wind, it is well-acknowledged from a biological perspective that cumulative impacts on marine ecology are even less well-understood than those on land. (**0007-10-5** [Meadow, Karen])

Comment: There is a serious proposal from the University of Delaware to put 170,000 five-megawatt wind turbines off the north Atlantic coast from North Carolina to New England. Currently, the largest offshore installation in existence is 80 smaller two-megawatt turbines in Denmark, and it has already been shown to alter the migratory pattern of certain species of marine birds which change their flight paths to avoid the turbines. How could species mitigate against 170,000 larger impacts? (**0007-10-6** [Meadow, Karen])

Response: *These comments identify some of the challenges of large-scale wind energy projects, including cumulative ecological effects. Additional text and references, including the National Research Council's 2007 report, were added to Section 9.2.3.2 of the EIS as a result of these comments.*

Comment: The ecological impacts of extensive solar installations on open land are also of potential significance. The dEIS states that as much as 16,000 acres of PV arrays would be needed to equal the capacity of the reactor. If a significant portion of this area does not become available on rooftops, then open land will be used because the Maryland RPS mandates the generation of a certain amount of electricity from sunlight by 2020. If the ecological impacts to this land are added to those from building large numbers of wind turbines, the effects will become even more serious. We therefore request a statement in section 9.2.4 that the alternative of a combination of renewable energy sources (wind, biomass (as specified above) and solar (if not on rooftops) will have detrimental environmental cumulative impacts and, again, cite the National Research Council's report as documentation. (**0006-1-5** [Meadow, Norman])

Response: *The environmental impacts of the selected combination of power sources are described in Table 9-3 of the EIS. No change to the EIS was made as a result of this comment.*

Comment: Land-based wind generation potential throughout the entire Mid-Atlantic Highlands (VA, WV, MD, PA) is estimated by the National Renewable Energy Laboratory to be 8015 MW of "total technical capacity." Using the generally recognized annual capacity factor of 30% for land-based wind in this region, the effective generation capacity of the entire four-state region is therefore 2,400 MW, just 1.5 times the capacity of the single proposed reactor. This means that offshore wind would have to be the major source of wind energy in this region. The Maryland Department of Natural Resources held two "Ocean Planning & Offshore Renewable Energy" presentations, at which it was stated that the "development and commissioning time" for offshore wind projects of greater than 350 MW capacity was from 4 to 7 years (this does not include the time required to gain approval of the projects). A 350 MW offshore wind installation will have an annual capacity factor of about 40%, so its effective capacity will be 140 MW, just one-tenth that of the reactor, but taking a comparable length of time to construct. This should be mentioned as another of the reasons for rejecting wind power as an alternative to the reactor. (**0006-1-6** [Meadow, Norman])

Response: *Additional text was added to Sections 9.2.3.2 and 9.2.4 of the EIS to further address wind power issues, including more information regarding the potential use of offshore wind power.*

Comment: Turning to the alternative generation methods of biomass grown to fire boilers, which is considered in the draft EIS, we would like to suggest that the final EIS include the amount of land needed to grow biomass that would provide the same 1600 megawatts of electricity as the Calvert Cliffs 3 reactor. Based on per-acre yields of about four tons per acre, that would require 1.7 million acres of land to be put under agriculture or under growing conditions just to fire boilers. We think this should be brought to the attention of the public so that they understand the magnitude of this alternative. While the draft EIS considers that currently there is not enough capacity in Maryland for biomass to be an effective alternative to Calvert Cliffs 3 reactor, we feel it is important to point out that even considering biomass use for power generation will encourage greatly increased use of forest products. This will be a great detriment to the ecology of the forest, encouraging stripping out large amounts of forest slash which is a vital nutrient replenishment for the forest as well as converting large amounts of land into short rotation forest crops and other biomass crops. (**0008-19-3** [Meadow, Karen])

Comment: The use of forest products for the generation of electricity will be the most land intensive of all the renewable technologies. The authors of the dEIS cited ecological concerns in the section on Wood Waste (9.2.3.6) when referring to large-scale timber cutting. The growth of short rotation forest crops (or switchgrass) to fire a 1600 MW boiler for a year would require well over a million acres of land. Slash from forest clear-cuttings has already been proposed as a fuel for electricity generation by the Maryland Governor's Commission on Climate Change, a practice which will deny important soil nutrients to land that is already heavily affected by the timber removal. We request that the ecological impact (large area of habitat required) of growing short-rotation forest crops be added to section 9.2.3.6). The title of this section should be changed from "Wood Waste" (a misleading term) to "Forest Products." Additionally we request that the ecological impacts (from the large area of habitat required) of growing and burning crops, e.g. switchgrass, be added to section 9/2/3/8). (**0006-1-4** [Meadow, Norman])

Response: *Section 9.2.3.6 of the EIS was modified to reflect the statement in Section 8.3.6 of NUREG-1437 that 400,000 to 800,000 acres could be affected to support a large wood waste plant. The review team determined that the heading for Section 9.2.3.6, "Wood Waste" was sufficiently clear that a change was not needed. Although switchgrass, a promising biofuel grass, is not specifically mentioned, a new paragraph concerning the general environmental impacts of biomass plants was added to Section 9.2.3.8, “Other Biomass-Derived Fuels.*

Comment: I would suggest that the NRC guidelines be upgraded to reflect changes in state regulatory policies. The EIS should accurately assess the potential resources and demand-side initiatives to meet need and benefit energy consumers and that they should apply these assessments and analysis to the integrated plan. It seems that the state is quite constrained to conduct a comprehensive energy plan and this analysis done by both the NRC and the Army Corps of Engineers, which is very significant, should be utilized to the benefit of the state and its need for a comprehensive energy plan. (**0008-7-6** [Fisher, Allison])

Response: *Potential resources to meet the need for power are discussed in Section 9.2 of the EIS. Potential demand side initiatives are discussed in Chapter 8 and in Section 9.2.1 of the EIS. No change to the EIS was made as a result of this comment.*

E.2.22 Comments Concerning Benefit-Cost Balance

Comment: So, also in terms of cost long term, this is a 60-plus-year asset that will be built here in Maryland. So, as shown with our current power plants, they are the lowest-cost baseload producers because operation, maintenance and fuel costs are very, very low and not volatile compared to many other baseload sources. Just the nature of the beast. We have a higher capital cost up front. But even with that there will be long-term benefits and long-term economic benefits. (**0007-11-6** [Kass, Leslie])

Response: *The license period for a combined license is 40 years. A licensee can request renewal for an additional 20 years. The benefit-cost analysis is done for the license period of 40 years. It would not be appropriate to assume additional cost or benefit for an additional 20 years of license renewal when that action has not been requested or approved. This comment expresses support of the applicant's COL application. No change to the EIS was made as a result of this comment.*

Comment: And that brings me to the final point I want to make today, which is on Section 10. And it's on the cost of this reactor. And it's something we've been harping on quite a bit over the years. And this document just simply accepts UniStar's cost estimate. There's no analysis whatsoever about whether this estimate is realistic or not. None. I mean, you just took their cost estimate which is $7.2 to $9.6 billion for this plant, for anybody who hasn't read it yet, and you cut that and paste it in this document. And then you call that a conservative estimate. That's not an analysis. That's not an EIS. That's cutting and pasting. And let's remember that there are 104 operating reactors in the United States right now. Every one of those reactors experienced a cost overrun. None of them were built on budget. And in 1986, as far back as 1986, the DOE did a study, Energy Information Administration, I'd be happy to get a copy of it for you, did a study. The first 85 reactors built in the United States had an average cost overrun of 207 percent. 207 percent. Let's put that into the Calvert Cliffs context. If we're starting off at $7.2 billion, going up to $9.6 billion, and we get 207 percent increase, we're looking at $21 to $30 billion. I don't actually think UniStar is going to spend that much of our tax money on this plant. They'll abandon it well before they get up to 200 percent. But there has to be some sort of cost escalation figure when you're looking at the possible costs of this plant, because all history tells us that there is going to be cost escalations. (**0007-5-7** [Mariotte, Michael])

Response: *UniStar's cost estimates included site-specific information. The estimates were reviewed and compared to other published costs estimates available and considered to be reasonable. This comment also expresses concern about cost overruns associated with escalating costs of new reactors. The purpose of the EIS is to disclose potential environmental impacts of building and operating the proposed nuclear power plant. Issues related to costs associated with previous projects are outside the scope of the proposed action and are not addressed in the EIS. Chapter 10 of the EIS discusses the estimated overall costs and environmental impacts of the proposed project. No change to the EIS was made as a result of this comment.*

Comment: The high cost of building reactors is often erroneously cited as leading to higher electricity costs. This is not the case, as illustrated by the Maryland PSC report, indicating the fact that nuclear power will be the most cost-beneficial. In fact, because Calvert Cliffs number 3 will operate at 90 percent capacity and run turbines at only 30 percent of capacity annually, to generate the same electricity as Calvert Cliffs number 3 with wind turbines would require a minimum of 4,000 two-megawatt turbines. The cost per megawatt, even at the low end of $2 per watt installed, wind would cost close to $8 to $10 billion dollars, and produce only an intermittent electricity supply due to fluctuation of wind. In addition, the reactor will work for at least 60 years, whereas wind turbines will have a working life of approximately only 20 to 25 years. That means that for the working life of the reactor, 60 years, the cost is $170 million per year while the wind turbines at 25 years working life will cost $760 million a year. Invoking the history of cost overruns in reactor construction 30 years ago are irrelevant, as they were all built as different designs under different conditions than currently is the case. (**0008-19-2** [Meadow, Karen])

Response: *This comment discusses the cost effectiveness of nuclear power relative to alternative power sources. The NRC does not promote the use of nuclear power as a preferred energy alternative, and it does not regulate alternatives producing electricity that do not involve nuclear power. The NRC does evaluate energy alternatives in applications for new nuclear power plants as part of its review in accordance with NEPA requirements. The discussion of alternative energy sources in Chapter 9 of the EIS described potential impacts from these sources in comparison with the proposed action. The license period for a combined license is 40 years. A license renewal would be needed to extend a unit an additional 20 years. Issues related to costs associated with previous projects are outside the scope of the proposed action and are not addressed in the EIS. No change to the EIS was made as a result of this comment.*

Comment: As other people have said before me, it's affordable. It has the lowest cost of producing electricity of any other sources, 1.87 cents per kilowatt hour for nuclear compared to 2.75 for coal. (**0008-23-3** [Robinson, Duncan])

Response: *This comment refers to the affordability of nuclear power relative to coal. No change to the EIS was made as a result of this comment.*

Comment: [W]hen a merchant nuclear facility is introduced into the system, electric prices will drop as more expensive fuel plants are displaced. In 2009, hearings before the Maryland Public Service Commission, independent experts hired by the PSC's staff, testified regarding the possible effects of BGE [Baltimore Gas and Electric Company] ratepayers of building the third nuclear unit at Calvert Cliffs Nuclear Power Plant. Looking only at reduced electricity costs to consumers, these experts concluded that over the first eight years of Calvert Cliffs' Unit 3 operation, BGE customers would save an average of $141 million annually by purchasing electricity from a new Calvert Cliffs Unit 3. Other experts testified that over the same period, Maryland consumers would collectively realize between 1.1 billion and 1.6 billion in benefits in Calvert Cliffs Unit 3, if Calvert Cliffs Unit 3 were built. (**0007-12-4** [Lamboley, Genny])

Comment: [W]hen a merchant nuclear facility is introduced into a system, electric prices will drop as more expensive fossil plants are displaced. In 2009, hearings before the Maryland Public Service Commission, independent experts hired by the PSC [Public Service Commission] staff testified regarding the possible -- possible effects on BGE ratepayers of building a third nuclear unit at Calvert Cliffs. Looking only at reduced electricity cost to the consumer, these experts concluded that over the first eight years of Calvert Cliffs Unit 3 operation, BGE customers would save an average of $141 million annually by purchasing electricity from the new unit. Other experts testified that over the same period, Maryland consumers would collectively realize between 1.1 billion and 1.6 billion in benefits if Calvert Cliffs 3 were built. (**0008-11-3** [Lamboley, Genny])

Response: *The benefit cited in these comments is actually an environmental cost of the alternative rather than a specific benefit of nuclear energy. NRC has chosen to keep these costs and benefits separate. No changes to the EIS were made as a result of these comments.*

Comment: Turning to the economic impacts of the proposed reactor, we note that the authors of the dEIS have overlooked a major economic benefit to the Maryland ratepayer. The authors cite (see section 9.5, reference MPSC 2008b: Final Report Under Senate Bill 400) the findings of a Maryland Public Service Commission report that wind (section 9.2.3.2) and solar (section 9.2.3.3) power will have from small to negative economic impacts on the Maryland ratepayer. In 2007, however, the MPSC issued what it termed an "interim report" (Interim Report of the Public Service Commission of Maryland to the Maryland General Assembly, Dec. 3, 2007); this report was poorly named because it was not replaced by the final report, it, in fact, contained information and conclusions that were not repeated in the final report. Importantly, the MPSC concluded in the interim report (p. 39) that "...the nuclear case provides the highest cumulative EVA [Economic Value Added], ...[offering] a rapid, substantial and sustained benefit to Maryland ratepayers unmatched over the 20-year horizon by any other option...." The MPSC estimated that the third reactor at Calvert Cliffs would benefit the Maryland ratepayer $2.9 billion (p. 38). This conclusion should be cited somewhere in section 10, perhaps in 10.6.3, which now states that "...no specific monetary values could reasonably be assigned..." If they have not already done so, we suggest that the NRC staff read the source documents for the MPSC's reports, which are the reports produced by Levitan and Associates and are found on their web site (www.levitan.com). (**0006-1-7** [Meadow, Norman])

Response: *This comment discusses the benefits to ratepayers from the proposed Unit 3 relative to alternatives. Alternatives are evaluated as a part of the NEPA process in Chapter 9 of the EIS in terms of impacts on the environment. A comparison of monetary costs between alternatives and the proposed unit was not evaluated as the NRC is not authorized to choose the most cost-effective alternative. No change to the EIS was made as a result of this comment.*

E.2.23 General Comments in Support of the Licensing Action

Comment: Based on the information provided in the EIS and comments from reviewers, the Commonwealth of Virginia has no objection to the proposal as presented, provided UniStar complies with all applicable laws and regulations. This project is unlikely to have significant effects on Virginia's ambient air quality, water quality, important farmland, wetlands, wildlife, historic resources or forest resources. It will not affect species of plants, animals, or insects listed by state agencies as rare, threatened, or endangered. (**0005-1-1** [Fisher, John] [Irons, Ellie])

Comment: The Maryland Conservation Council strongly agrees with the conclusion that the reactor should be built. (**0006-1-1** [Meadow, Norman])

Comment: It's my strong hope that both the Draft EIS and the DA [Department of the Army] individual permit will be finalized and affirmed positively leading to the issuance of a COL for Calvert Cliffs 3 at the earliest possible time. (**0007-1-1** [O'Donnell, Anthony])

Comment: I agree with the conclusions of the Draft EIS and its preliminary recommendations. (**0007-1-3** [O'Donnell, Anthony])

Comment: As minority leader in the legislature, I have a similar responsibility on a statewide basis to assess and gauge statewide level of support or concern for any issue of importance to the State. I can report to you today that this proposed project by UniStar at Calvert Cliffs has very broad and bipartisan support both locally and statewide. (**0007-1-4** [O'Donnell, Anthony])

Comment: I strongly support the finalization of this EIS, issuance of the Corps permit, and ultimately issuance of the COL for Calvert Cliffs 3. (**0007-1-9** [O'Donnell, Anthony])

Comment: I'm here as a resident of Maryland, and as a concerned resident who supports the Calvert Cliffs Unit 3 because of the demand for power in this area and the demand for clean energy in our economy that is low-cost that we can afford. (**0007-11-1** [Kass, Leslie])

Comment: I support this for my family, as well as our community. And think it is a wise investment and appreciate the work done by the NRC because we're going to need this and many more sources going forward. (**0007-11-7** [Kass, Leslie])

Comment: I would like to say that I do support this third reactor. And I do hope that - I want to say that I appreciate the positives and the negative opinions, because they're most warranted because it puts us to stay on our Ps and Qs. But, you know, I do believe that having this reactor is more positive for this county than it is for the negative. (**0007-16-5** [Wilson, Robert])

Comment: As a board member of the Chamber, it should be no surprise that I support the potential expansion at Calvert Cliffs. (**0007-17-1** [Chambers, Bill])

Comment: We [the Calvert County Chamber of Commerce] support the findings of the Draft Environmental Impact Statement. We support UniStar and Constellation in their efforts to build at Calvert Cliffs. (**0007-17-4** [Chambers, Bill])

Comment: And, finally, we [the Calvert County Chamber of Commerce] support the NRC staff recommendation to approve the combined operating license as submitted. The Draft

Environmental Impact Statement although quite lengthy, indicates minimal environmental impact. (**0007-17-6** [Chambers, Bill])

Comment: CASEnergy supports the NRC's preliminary recommendation that the environmental portion of Calvert Cliffs 3 combined license go forward as proposed. (**0007-18-1** [Pennoyer, Gordon])

Comment: I ask you to just keep that in consideration [that Constellation Energy is a good neighbor] when you think of some expansion of something of this that will make our nation great … I hope you continue to support this Reactor Number 3. (**0007-19-2** [Priddy, Bob])

Comment: Based on the findings outlined in the Draft EIS and recommendations of NRC staff, the [Calvert County Board of County] Commissioners concur with the findings of the Draft EIS that indicate minimal impact from the construction and operation of a new nuclear reactor at Calvert Cliffs ... [I]n general, we are satisfied with the findings related to air and water quality, economic and social impact and the need for energy in the nation. (**0007-2-2** [Parran, Wilson])

Comment: As the Calvert County Board of County Commissioners have repeatedly stated, our decision to support the potential expansion remain simple, uncomplicated and consistent. Today our support continues, and we look forward to the day when Calvert Cliffs again makes history receiving NRC approval to construct and operate Unit 3. (**0007-2-5** [Parran, Wilson])

Comment: On behalf of the [Calvert County] Tourism Advisory Commission, please accept our support of the potential expansion of the Calvert Cliffs and the preliminary findings of the Nuclear Regulatory Commission in their Draft Environmental Impact Statement for this project. (**0007-20-1** [Bless, Melissa])

Comment: You have the full support of the Tourism Advisory Commission in the expansion of the Calvert Cliffs and the addition of the Unit 3. And we look forward to a favorable ruling by the NRC and the ultimate issuance of a combined operating license. (**0007-20-5** [Bless, Melissa])

Comment: We [America Federation of Labor and Congress of Industrial Organizations—commonly referred to as America’s Union Movement] would like to thank the NRC for holding this public hearing and share our support of the NRC's preliminary recommendation that the environmental portion of the Calvert Cliffs 3 combined license go forward as proposed. (**0007-21-1** [Edwards, Donna])

Comment: I am a fifth generation native of Calvert County. I've raised my family just up the road from Calvert Cliffs 1 and 2. And last year we started the next generation. We have a grandchild. I have worked with my father and other family members on our family farm raising tobacco, corn, hay, vegetables, working that land. Generations before me made their living on the Chesapeake Bay and the Patuxent River. I care about this land. And I care about this water. They are part of who I am. It's where I come from. These natural resources, they are gifts to us on this earth. They're not to be handled recklessly, but responsibly. And let me assure you that I want an energy source that is safe and reliable for my family and future generations. I want an energy source that will meet our nation's growing demand and minimize emissions. And I want a company that has high standards and strong values when it comes to protecting our environment, a company that will be a responsible neighbor and be an excellent steward of this land. I fully support the approval and the issuance of the Environmental Impact Statement. (**0007-22-9** [Kennedy, Sherri])

Comment: I share our support of the NRC's preliminary recommendation that the environmental portion of Calvert Cliffs 3 combined license go forward as proposed. (**0007-23-1** [Martin, Kendall])

Comment: For our members [Iron Workers Local 5], this community, and our environment, I ask that the NRC move forward with this project. (**0007-23-7** [Martin, Kendall])

Comment: We [the Maryland Conservation Council] fully agree with the conclusion of the NRC staff that the combined operating license for the reactor be granted. (**0007-9-1** [Meadow, Norman])

Comment: The [Calvert County Board of County] Commissioners concur with the findings of the draft EIS that indicate minimal impact from the construction and operation of a new nuclear reactor, specific to our support for the environmental findings impacting our constituents, and the constituents of Maryland. These areas include water and air emissions, socioeconomic impact and the demand for energy supply. Water use and water quality are always a concern, particularly in Southern Maryland. (**0008-1-1** [Parran, Wilson])

Comment: I reiterate that we [Calvert County Board of County] Commissioners understand the NRC's preliminary recommendation that the combined operating license be issued as requested. Our decision to support the potential expansion remains simple, uncomplicated and consistent. Calvert County continues to stand by Calvert Cliffs Nuclear Power Plant, Constellation Energy and UniStar just as we have done in the past. (**0008-1-5** [Parran, Wilson])

Comment: I, along with CASEnergy, proudly support the NRC's preliminary recommendation that the environmental portion of Calvert Cliffs 3 combined license go forward as proposed. (**0008-12-1** [Pennoyer, Gordon])

Comment: By approving a new proposed reactor at Calvert Cliffs, Maryland can take the lead in providing the U.S. with the clean energy future it so desperately needs. (**0008-12-13** [Pennoyer, Gordon])

Comment: I believe that the construction of another new nuclear power plant would be a wonderful thing for Southern Maryland. Certainly better than any other source of energy could be. There is a great need for it, and this is why I'm in favor of proceeding with Calvert Cliffs Unit 3. And I thank the NRC for the opportunity to say a couple of words in support. (**0008-14-5** [Meraz, Christopher])

Comment: I live in this community and you have my support for this project. (**0008-16-4** [McClure, Kim])

Comment: We're [Patuxent Partnership] an organization with over 300 members. On behalf of the Partnership, please accept our support of the proposed expansion of Calvert Cliffs. (**0008-17-1** [Green, Bonnie])

Comment: From the [Patuxent] Partnership's perspective, we see no negative impact from an expanded Calvert Cliffs. You have the full support of the partnership and the conclusions of the environmental report. (**0008-17-6** [Green, Bonnie])

Comment: We [Sheriff's Office] support it. (**0008-18-2** [Thomas, Richard])

Comment: I believe this is my fifth trip to Calvert County to testify in favor of this project, and if there were ten more hearings I would be at those, too. (**0008-2-1** [Hodge, Gary])

Comment: Tonight I am here to provide support of the findings of the draft environmental impact statement. It is our [Charles County Board of Commissioners] understanding that the draft environmental report is a detailed evaluation of possible impacts to the environment, including land, water, air, ecology, and socioeconomic conditions related to the construction and operation of a new nuclear unit. It is also our understanding that the report demonstrates that the environmental impact is minimal. (**0008-2-3** [Hodge, Gary])

Comment: Charles County supports the potential expansion of Calvert Cliffs ... Regardless of whether the expansion occurs, we must have reliable, clean energy and meet our responsibility to the environment. The Charles County Commissioners support the findings of the draft EIS. (**0008-2-7** [Hodge, Gary])

Comment: [R]ight now Calvert Cliffs is the best place to build a new reactor and to ensure our energy future. (**0008-21-10** [Allison, Kathleen])

Comment: I am here before you to strongly support the findings of the draft EIS and the construction of Unit 3. (**0008-21-2** [Allison, Kathleen])

Comment: The site is already proven, through previous environmental impact assessments that the site is suitable. This was proven with the relicensing efforts in 2000. We are just reaffirming the obvious. It's suitable for licensure. (**0008-21-8** [Allison, Kathleen])

Comment: I'd like to say that we think strongly we should support new nuclear and this new site, this new unit for the Calvert Cliffs site, because it's the right thing to do for Calvert County, for our state as well as for our country. (**0008-23-7** [Robinson, Duncan])

Comment: [S]he [delegate Sally Jameson] asked that you accept her full support of the project and the findings of the draft environmental impact statement. (**0008-3-1** [Clark, Jerry])

Comment: In December 2007, the [Tri-County] Council [for Southern Maryland] adopted a resolution to fully support the efforts of Calvert County to secure a third reactor at Calvert Cliffs Nuclear Power Plant. We passed a resolution based on significant and positive socioeconomic, environmental and economic impacts the project will have at the local, regional, state and national levels. As an advocate for the region's interest and priorities, it is my pleasure to, once again, publicly offer continuing support of UniStar's plan to construct and operate Unit 3 at Calvert Cliffs. (**0008-3-2** [Clark, Jerry])

Comment: The Board of County Commissioners of all three Southern Maryland Counties have endorsed the project as well, as have the Chambers of Commerce of all three counties, the Patuxent Partnership, numerous business owners, the United Way, the College of Southern Maryland, Calvert Memorial Hospital, the trade unions and many other individuals and organizations. (**0008-3-4** [Clark, Jerry])

Comment: I look forward to having the application approved and move forward with construction so that we can have clean energy that's low cost for our families in the future. (**0008-5-5** [Kass, Leslie])

Comment: These findings reinforce the EDC's [Calvert County Economic Development Commission's] unequivocal confidence in this project. (**0014-1-2** [Barber, Alonzo])

Comment: Once again, I enthusiastically extend my support for the expansion at Calvert Cliffs Nuclear Power Plant and thank the NRC for receiving my comments. (**0015-1-5** [Wolfley, Terri])

Response: *These comments provide general information in support of the applicant's COL. No changes to the EIS were made as a result of these comments.*

E.2.24 General Comments in Support of the Licensing Process

Comment: I appreciate the NRC's tremendous effort. If you were graded by weight, obviously you would get a very good grade based on the thickness of that report and the number of people and trips and information that goes into that. It reflects a tremendous group and team effort. (**0007-11-2** [Kass, Leslie])

Comment: I believe the Draft Environmental Impact Statement is accurate in its finding stating minimal impact, environmental impact, as it relates to public safety. The minimal impact covers both the construction phase and the normal operations once built. (**0007-15-1** [Vaughn, Jackie])

Comment: It is critical that the potential Calvert Cliffs project be treated fairly through the regulatory process as it would be for any business in the county. Certainly we [the Calvert County Chamber of Commerce] expect this to be done within your regulatory limits. (**0007-17-3** [Chambers, Bill])

Comment: I want to again thank the NRC for the open and transparent process for reviewing the Unit 3 project. We [the Calvert County Board of County Commissioners] welcome public input from all parties and appreciate your efforts to let all opinions be heard. (**0007-2-1** [Parran, Wilson])

Comment: We [the Calvert County Board of County Commissioners] appreciate the NRC's open and transparent process and welcome public input from all parties. (**0007-2-4** [Parran, Wilson])

Comment: The NRC's review of this project has been comprehensive and inclusive. (**0007-23-4** [Martin, Kendall])

Comment: We [Maryland Conservation Council] think that the analysis in the Draft EIS is accurate and very thorough. (**0007-9-2** [Meadow, Norman])

Comment: Regarding the NRC's draft Environmental Impact Statement, we [Patuxent Partnership] support the findings that have been presented, that expansion of Calvert Cliffs Unit 3 will have minimal environmental impact on Calvert County and on Southern Maryland. (**0008-17-2** [Green, Bonnie])

Comment: On behalf of the Charles County Board of County Commissioners, I thank you for the opportunity to weigh in on the draft environmental impact statement for proposed Unit 3 at Calvert Cliffs Nuclear Power Plant. (**0008-2-2** [Hodge, Gary])

Comment: We also absolutely support the NRC process where everyone has a chance to be heard. (**0008-2-8** [Hodge, Gary])

Comment: The NRC licensing process takes into consideration the environmental impact associated with the construction and operation of a nuclear reactor. It also includes a long and rigorous public participation process which we're seeing in action here tonight. The draft EIS identifies areas of small, moderate or large impacts. Yes, there are impacts, but the report also provides recommendations for mitigating these impacts. (**0008-21-3** [Allison, Kathleen])

Comment: I thank the NRC for being here today and for listening to all the public comments and for considering the support given by the Tri-County Council of Southern Maryland on this project. (**0008-3-8** [Clark, Jerry])

Comment: The [Southern Maryland] Consortium [of African American Community Organizations] applauds the Nuclear Regulatory Commission, for taking time to thoroughly study the environmental impact of this project and the Consortium supports its findings. Consortium members include the presidents of the Calvert County NAACP, the Charles County NAACP, the St. Mary's NAACP, the Calvert County Minority Business Alliance, the Charles County Black Caucus, the Alphas of Southern Maryland, the Minority Business Advocacy Council of Charles County, and the TIPS group of St. Mary's County. The Consortium did not speak at prior hearings because we did not have sufficient information with which to support or not to support this third reactor. However, Consortium members did submit letters to the Nuclear Regulatory Commission indicating or regarding some environmental concerns. These letters were from the Calvert County NAACP, the Calvert County Minority Business Alliance and Concerned Black Women of Calvert County. (**0008-6-1** [Spencer, Doris])

Comment: On behalf of the Calvert County Economic Development Commission, I offer support for the NRC's Draft Environmental Impact Statement for the Calvert Cliffs Nuclear Power Plant Unit 3 Combined License in Lusby, Md. As chair of the EDC, I have testified in support of Calvert Cliffs Nuclear Power Plant and its proposed expansion on numerous occasions. The EDC understands that the Draft Environmental Impact Statement reveals that there would be minimal impact to the environment with construction of Unit 3. (**0014-1-1** [Barber, Alonzo])

Comment: I would like to reiterate the [Calvert County Economic Development Commission's] full cooperation and support of the NRC regulatory process. (**0014-1-5** [Barber, Alonzo])

Comment: I am offering this letter of support for the NRC's Draft Environmental Impact Statement for the Calvert Cliffs Nuclear Power Plant Unit 3 Combined License in Lusby, Md. (**0015-1-1** [Wolfley, Terri])

Response: *These comments are supportive of the licensing process and are general in nature. No changes to the EIS were made as a result of these comments.*

E.2.25 General Comments in Support of Nuclear Power

Comment: If states like Maryland and other states are ever to reach our clean air emissions reductions goals while meeting our increasing demand for electrical generation capacity, facilities like Calvert Cliffs 3 are essential, and are essential now. (**0007-1-8** [O'Donnell, Anthony])

Comment: Several of those original members [Maryland Conservation Council] are still active and support Calvert Cliffs Number 3 as a more benign environmental alternative to renewables. (**0007-10-1** [Meadow, Karen])

Comment: According to the U.S. Department of Energy, our electricity demand will increase 25 percent by 2030. To meet the need and reduce greenhouse gas emissions, that will require our nation to rely even more on nuclear energy. (**0007-12-2** [Lamboley, Genny])

Comment: Increasing Maryland's nuclear-generating capacity will provide a hedge against the risk of future shortages and price fluctuations of alternative-generating systems. As noted in the Draft EIS, nuclear energy has relatively low, nonvolatile fuel costs and a project capacity utilization rate of 85 to 93 percent, which makes it a dependable source of electricity that can provide relatively stable prices to consumers. Nuclear energy remains the most cost effective and reliable means of baseload generation. It costs about 1.87 cents to produce each kilowatt hour of electricity from nuclear energy. Coal is about 2.75 cents. Natural gas is about eight cents. And petroleum costs are roughly 17 cents. (**0007-12-3** [Lamboley, Genny])

Comment: Nuclear energy is the only large-scale emissions resource of electricity that we can readily expand to meet our growing energy demand. It already accounts for more than 70 percent of all the clean energy produced in the U.S., and supplies 20 percent of all U.S. power. The reality is we will require more power from a variety of sources in the years ahead. A wise energy policy recognizes the virtue of diversity. And in this diverse plan, nuclear energy is a critical component. We all have a shared stake in America's energy future. Now is the time for our country to support nuclear energy as a means to generate electricity with a clean, safe and dependable source of power. (**0007-12-5** [Lamboley, Genny])

Comment: I believe that we have opportunity with the nuclear plant in Calvert County with the third reactor being installed, that we have a more safer way of being able to be provided with power. (**0007-16-4** [Wilson, Robert])

Comment: We [the Calvert County Chamber of Commerce] support our county commissioners and their endorsement of an expanded plant. And the Chamber supports the use of nuclear power as an alternative solution for stable, reliable energy. This advanced technology will become one of the most productive mechanisms to reduce global warming. (**0007-17-5** [Chambers, Bill])

Comment: Now is the time for our country to support the development of more clean, safe and dependable nuclear energy as means to meet our future clean energy needs and generate emissions-free electricity. By approving a new proposed reactor at Calvert Cliffs, Maryland can take an important lead in providing the U.S. with the clean energy future it desperately needs. (**0007-18-12** [Pennoyer, Gordon])

Comment: The Draft EIS is a significant regulatory milestone in the licensing efforts for Calvert Cliffs 3. And it's another step toward meeting the region's energy needs through secure, reliable carbon-free electrical generation which does not contribute to global warming. (**0007-22-1** [Kennedy, Sherri])

Comment: Nuclear energy has the lowest impact on the environment of any energy source. Calvert Cliffs 3 will add 1600 megawatts of generating capacity through a safe, secure and reliable source of power that does not produce greenhouse gases. (**0007-23-5** [Martin, Kendall])

Comment: We [Maryland Conservation Council] strongly believe that nuclear power is the most effective, least expensive, most reliable, and by far the most benign environmentally of any other method of generating electricity. (**0007-9-9** [Meadow, Norman])

Comment: [W]e will need 25 percent -- nearly 25 percent more electricity by 2030. And to meet that demand our nation will have to rely more heavily on nuclear. Increasing Maryland's nuclear energy generating capacity will provide a hedge against the risk of future shortages and price fluctuations of alternative generating systems. (**0008-11-1** [Lamboley, Genny])

Comment: As noted in the draft EIS, nuclear energy has a relatively low and nonvolatile fuel cost, approximately .5 cents per kilowatt hour, and a project capacity utilization rate of 85 to 93 percent, which makes it a dependable source of electricity that can provide relatively stable prices to consumers. Nuclear energy also remains the most cost- effective and reliable means of baseload generation. It costs about 1.87 cents to produce each kilowatt hour of electricity from nuclear. Coal is about 2.75 cents. Natural gas is about eight cents and petroleum costs roughly 17 cents. (**0008-11-2** [Lamboley, Genny])

Comment: Nuclear energy is the only large-scale emissions-free source of electricity that we can readily expand to meet our growing energy demand. It already accounts for more than 70 percent of all the clean energy produced in the U.S. and supplies 20 percent of all U.S. power. The reality is, is we'll require more power from a variety of sources in the years ahead. A wise energy policy recognizes the virtue of diversity and in that diverse plan, nuclear energy is a critical component. (**0008-11-4** [Lamboley, Genny])

Comment: Now is the time for our country to support the development of more clean, safe and dependable nuclear energy as a means to meet our clean energy future. (**0008-12-12** [Pennoyer, Gordon])

Comment: I'm not concerned about the proposed reactor, and I'm not concerned about any proposed changes regarding air emissions, water quality or noise. To me, the plant does not emit greenhouse gases, and any changes being proposed will not be harmful to the environment. They are compatible with EPA standards. (**0008-16-2** [McClure, Kim])

Comment: The nation's nuclear power plants are among the safest and most secure industrial facilities in the United States. Multiple layers of physical security, together with very high levels of operational performance protect plant workers, the public and our environment. When weighing this against the factor that nuclear plants do not generate carbon dioxide, the principal greenhouse gas, it is difficult to find arguments against expanding the country's nuclear energy capability. (**0008-17-4** [Green, Bonnie])

Comment: From our perspective, we [Charles County Board of County Commissioners] believe it is time to make a difference. We need to increase our supply, reduce our dependence on foreign supply, and we need to do this as quickly as possible. However, we must weigh the impact of the environment while doing so. Nuclear energy is the only large-scale clean air electricity source that can be expanded to dramatically mitigate the nation's greenhouse gas emissions. Nuclear energy accounts for 71 percent of the nation's clean air electricity generation and 20 percent of the nation's overall electricity consumption. (**0008-2-6** [Hodge, Gary])

Comment: In the United States we currently have more than 100 nuclear power plants that have quietly supplied clean energy and economical power for decades. Excuse me. Clean and economical power for decades. I guess it is economical power if you are doing it cheaply, isn't it. These plants and the power they produce and the jobs they create help provide our quality of life and are continuing to enhance our quality of life. (**0008-21-4** [Allison, Kathleen])

Comment: We at NA-YGN [North American Young Generation of Nuclear] believe very strongly that nuclear is the answer to meet future electric demand because it is affordable, safe, reliable [low] greenhouse-gas-emitting. (**0008-23-1** [Robinson, Duncan])

Comment: One of the things I want people to understand about nuclear energy is, first of all, it's clean enough to run inside a sealed submarine. In my mind, that makes it clean enough to be power for anybody. (**0008-27-1** [Adams, Rod])

Comment: [O]ne of the reasons the environmental impacts from nuclear are so low, compared to many of the alternatives is that this will be a 60-year plant that will run as baseload. That means 24/7, 90 percent of the time it's on. Unparalleled capacity factor. So, every generation source has some environmental impact when you build it, but the return on nuclear is much higher because we generate so many megawatts and can provide that baseload source that's vital. (**0008-5-4** [Kass, Leslie])

Comment: I ... look forward to a resurgence in America's nuclear energy program beginning with construction of Unit 3 at Calvert Cliffs. (**0014-1-6** [Barber, Alonzo])

Response: *These comments provide general information in support of nuclear power. No changes to the EIS were made as a result of these comments.*

E.2.26 General Comments in Support of the Existing Units

Comment: I do have full confidence in the operators and employees of Constellation Energy and UniStar Nuclear to construct and operate this facility with the utmost safety and with the public interest always at the fore. (**0007-1-5** [O'Donnell, Anthony])

Comment: We [Solomons Business Association] know Constellation's reputation for charity and environmental management. We know their record for safety and security. And we know their dedication to providing energy that is clean, renewable and reliable. The bottom line is we know Calvert Cliffs Nuclear Power Plant, and we consider them a responsible, important member of our business community just like the hardware store, the boat store and the winery. (**0007-14-1** [Simpson, Lauren])

Comment: Constellation is and has been an outstanding corporate entity here, and they pump millions of dollars into the local/regional state economy every year. (**0007-17-2** [Chambers, Bill])

Comment: Given our history with the plant and the fact that no significant findings occurred during the re-licensing process, we agree with this finding. As you conduct your final environmental review, we ask that you remember what an outstanding partner Constellation has been to our community and what a contributor they are and continue to be to our economy. But most importantly, please remember their constant and continued commitment to the environment. I look forward to representing the [Calvert County] Chamber [of Commerce] again when your final review is complete. I am confident that I will be able to stand before you again in support of Constellation and the minimal impact the proposed construction and operation will have here in Calvert County where I live and where businesses thrive. (**0007-17-7** [Chambers, Bill])

Comment: Equally important, the proposed new reactor would follow the standards set by Calvert Cliffs 1 and 2, and continue to serve as a good neighbor to the surrounding community. Today at Calvert Cliffs 1 and 2, approximately 1800 of the existing site's 2100 acreage is dedicated natural habitat and home to bald eagles, wild turkey, fox, deer and two endangered species of tiger beetles. Following this tradition of environmental stewardship, I'm proud to see that UniStar Nuclear Energy has taken steps to ensure that the proposed Calvert Cliffs 3 facility is designed to have minimal impact on the environment and aesthetics of the region. (**0007-18-5** [Pennoyer, Gordon])

Comment: I just want to say thank you to the BG&E, to Constellation Energy for being a good neighbor. Through the years I have worked with them through our civic association. And whatever we need, the Constellation Energy or the nuclear power plant was there to be a good neighbor thinking of all the things that we have to provide out of Calvert County is energy which is great for our county, for our state and our nation. (**0007-19-1** [Priddy, Bob])

Comment: Calvert Cliffs has already proven itself with a strong environmental record. We [Calvert County Tourism Advisory Commission] believe this will continue with the Unit 3 Project. (**0007-20-3** [Bless, Melissa])

Comment: The standards and values established by Constellation Energy decades ago will continue through UniStar at Calvert Cliffs 3. Environmental stewardship is a fundamental, corporate value that we believe in and exercise. (**0007-22-4** [Kennedy, Sherri])

Comment: I appreciate the efforts that have been made by Constellation Energy at Calvert Cliffs Nuclear Power Plant to ensure the protection of all our citizens. I also appreciate the daily outstanding working relationship we have with the plant and their ongoing 100 percent dedication to the safety and security of the facility to the general public. In all my years of law enforcement in this county, there has never been an incident, security breach or safety concern at the plant. With the open, reliable relationship we currently enjoy, I don't expect there to be any problems in the future. (**0007-7-1** [Evans, Michael])

Comment: Calvert Cliffs is a model, secure, professionally-run facility with multiple safety barriers. I am confident with the approval and Environmental Impact Statement and combined operating license, this will not change. (**0007-7-3** [Evans, Michael])

Comment: [T]he proposed new reactor would follow the standard set by Calvert Cliffs 1 and 2, and continue to serve as a great neighbor for the surrounding community. (**0008-12-4** [Pennoyer, Gordon])

Comment: Following the tradition of environmental stewardship, UniStar Nuclear Energy has taken steps to ensure that the proposed Calvert Cliffs 3 facility is designed to have minimal environmental and aesthetic impact on the region. (**0008-12-6** [Pennoyer, Gordon])

Comment: In the community it's accepted that Calvert Cliffs is a safe plant and that it is an environmentally-friendly facility. (**0008-16-1** [McClure, Kim])

Comment: Calvert Cliffs has already proven itself with a strong environmental record. I believe this will continue with the Unit 3 project. (**0008-16-3** [McClure, Kim])

Comment: When my husband I moved with our three children to Calvert County in 2007, we selected our home fully aware of ... and comfortable with the close proximity of the Calvert Cliffs Nuclear Power Plant. (**0008-21-1** [Allison, Kathleen])

Comment: A lot of the people that came before me talked about benefits of a new unit in terms of tax revenues and the potential to decrease electric costs for Southern Maryland, but we also believe nuclear is the best choice because it's reliable. It's safe. Calvert Cliffs has a great track record for safety and I can personally attest to the focus and the priority that the management at the Calvert Cliffs plant gives to safety on a regular basis. (**0008-23-2** [Robinson, Duncan])

Comment: Constellation Energy Nuclear Group's focus on safety. It's paramount, and I know that over 200 years as my family has populated this area and my friends and fellow community members are there, that they are being kept safe as well. (**0008-25-1** [Nickels, Tiffany])

Comment: Over the last few years I've started hosting more and more peers from other nuclear plants from around the country and invariably I hear one comment during their visit there, which is that our plant is the most beautiful plant they've ever been to. And, yes, you can see that from the outside, but it's also intrinsically, in our culture, that environmental stewardship comes from the inside and grows outward. (**0008-25-2** [Nickels, Tiffany])

Comment: I grew up in a family where community service was every bit as much important to us as anything else, and I can tell you that as an employee of the Calvert Cliffs, our company supports our involvement in many programs like the March of Dimes, Christmas in April, Susan G. Komen Breast Cancer Foundation Walks, the Angel Tree Program, the Smart program where employees are given company time to go into elementary schools and help in classrooms. And also the United Way. You may know that Constellation Energy donated last year $2.6 million to the United Way and over 200,000 of those dollars were given by the employees of Calvert Cliffs and go right to the United Way of Southern Maryland. We know that Calvert Cliffs 3 would augment our staff by hundreds of people. We've heard that earlier tonight. And these people would have an even greater opportunity to amplify my efforts and do even more good work of those of my coworkers for the citizens and communities of Southern Maryland. (**0008-25-4** [Nickels, Tiffany])

Comment: Since the late 1970's, Constellation Energy has proved itself to be a good corporate citizen, a steward over the environment and a responsible member of the community. The public can expect the proposed new plant to follow that tradition. (**0008-3-7** [Clark, Jerry])

Comment: At UniStar Nuclear Energy we're committed to developing a nuclear energy facility that will provide safe, reliable and clean electricity to meet the region's growing energy needs. We believe the NRC review team's preliminary recommendation, that the environmental portion of the Calvert Cliffs 3 combined license application be issued as proposed, reaffirms our commitment to environmental stewardship. (**0008-4-2** [Jarmas, Ed])

Comment: These findings ... highlight Constellation's ability to operate as a responsible corporate presence in our community. (**0014-1-3** [Barber, Alonzo])

Comment: Over the years I have witnessed Constellation Energy's safe and secure plant operation, exemplary business practices and robust community support. The plant has been embraced by Calvert County, and Constellation has reciprocated as a vital community partner.

My fervent hope is that this relationship continues and strengthens through the exciting opportunities afforded by the plant's expansion. (**0015-1-2** [Wolfley, Terri])

Comment: I've come to value Constellation Energy as a strong business partner ... (**0015-1-3** [Wolfley, Terri])

Response: *These comments express support of the existing units at the site. No changes to the EIS were made as a result of these comments.*

E.2.27 General Comments in Opposition to the Licensing Action

Comment: I just wanted everybody to know that Calvert Cliffs site is not the place to go build a nuclear power plant. (**0007-6-14** [Sevilla, June])

Comment: We are here to hear about and learn about what will be the environmental impact of Calvert Cliffs 3, and I believe that no one can really answer that question, in spite of all the data that we've seen, the nice charts that have been constructed and the certain studies that have been done. And I say that no one can know what the impact will be and that especially includes difficulties with obviously negative environmental impacts. As we are seeing from the current environmental crisis in the Gulf, if something can go wrong it probably eventually, and over time and in some capacity will. (**0008-24-1** [Peil, Cynthia])

Response: *These comments express opposition to the construction and operation of a new nuclear unit at the site but do not specifically address the EIS. No changes to the EIS were made as a result of these comments.*

Comment: [I]n summary, please protect our environment. That is what I am asking you to do, what people everywhere want you to do and stop the permit process, stop all the applications until those difficult questions can be addressed. (**0008-24-9** [Peil, Cynthia])

Response: *As an independent executive agency accountable to Congress, the NRC has a timely obligation to initiate the review in response to a COL application as long as the application is considered by the NRC staff to be technically sufficient and complete. The licensing process for COL applications is specified in 10 CFR 52. No change to the EIS was made as a result of this comment.*

E.2.28 General Comments in Opposition to the Licensing Process

Comment: And the permissiveness by which this whole process is proceeding right now essentially to allow the dumping and spilling of radioactive waste on future generations, raises some very grave concerns about this particular process particularly in light of the fact that, as we heard today, that this whole idea of the Environmental Impact Statement preceding in advance of actually even having a design certified and approved. You know, it was conveyed to us that that process is being undertaken at a risk. (**0007-8-2** [Gunter, Paul])

Response: *10 CFR 52.55(c) allows a COL applicant, at its own risk, to reference a design that is under review by the NRC but not yet certified. The reactor for the proposed facility is one such design currently under review. However, a COL cannot be issued by the NRC until the reactor design is certified by the NRC. Applicants select a reactor technology based on their own business criteria. If the U.S. EPR reactor does not receive certification, then UniStar would have to determine whether it would proceed with a different reactor technology. A change in the reactor technology would need to be considered by the NRC to determine whether the change would be significant in terms of the environmental impacts of construction or operation. No change to the EIS was made as a result of this comment.*

Comment: [O]ne might hope that as challenging as it is to write these Environmental Impact Statements in any kind of comprehensible manner that tries to reach all the different levels of people, it's extremely disappointing to see the handling of solar and wind. And extremely disappointing that the EIS is being forced to come through here real fast. (**0007-13-4** [Johnston, Bill])

Response: *Alternative energy sources, including solar power and wind power, are discussed in Section 9.2 of the EIS. As an independent executive agency accountable to Congress, the NRC has a timely obligation to initiate the review in response to a COL application as long as the application is considered by the NRC staff to be technically sufficient and complete. The licensing process for COL applications is specified in 10 CFR 52. No change to the EIS was made as a result of this comment.*

E.2.29 General Comments in Opposition to Nuclear Power

Comment: How much can we expect from the Environmental Impact Statement as an explanation for educating the public on these complex issues that we face? Here's a quote from Carl Sagan: We live in a society exquisitely dependent on science and technology in which hardly anyone knows anything about science and technology. This is a prescription for disaster. We might get away with it for a while, but sooner or later this combustible mixture of ignorance and power is going to blow up in our faces. (**0007-13-1** [Johnston, Bill])

Comment: [I]f something goes wrong with things as nuclear power plants, it isn't something that will be dispersed over a number of years or with certain area. Nuclear difficulties leave us with things that stay deadly pretty much forever. (**0008-24-2** [Peil, Cynthia])

Comment: The people that are proposing this licensing process are counting on Government funding. I, as a taxpayer, do not want to fund something as unpredictable as nuclear power. (**0008-24-4** [Peil, Cynthia])

Comment: We don't have ... that amount of time or shouldn't use it for the Government to figure out that nuclear power is not the answer for ... meeting our energy needs. (**0008-24-7** [Peil, Cynthia])

Response: *These comments express general opposition to nuclear power and do not specifically address the EIS. No changes to the EIS were made as a result of these comments.*

E.2.30 Comments Concerning Issues Outside Scope – Emergency Preparedness

Comment: I was also former director of emergency preparedness at Calvert Cliffs, and have complete confidence in this facility's ability to execute its very robust emergency preparedness plans in the event of the remote possibility that they would ever be needed. (**0007-1-6** [O'Donnell, Anthony])

Comment: From a public safety standpoint, Calvert County is both comfortable with the existing plant operations and prepared to address any events that could occur at the plant. Know, too, that we will continue to work with state and federal agencies to maintain the best possible emergency plan as we look forward to the construction of the third reactor at Calvert Cliffs. (**0007-15-4** [Vaughn, Jackie])

Comment: I'm on the St. Mary's County Highway Safety Committee over there. I can tell you from talking to some folks from the State Highway here, it appears that any proposed new section of bridge or expansion of bridge or what have you will not be done, it looks like, until sometime after number 3 goes into place. And the bridge today, when I came across from St. Mary's County was backed up -- just on a normal day. We have some significant issues over in St. Mary's County, and we're -- evacuation, and that's one of the concerns I have. (**0008-13-1** [Fedders, Roy])

Comment: I'm not for or against this project, but I am concerned about potential risks, particularly if something does happen with evacuation. (**0008-13-4** [Fedders, Roy])

Comment: Tonight I would like to address the NRC about Calvert Cliffs' potential environmental impact as it relates to emergency preparedness. Federal law requires that energy companies develop and exercise comprehensive emergency response plans to protect the public in the unlikely event of an accident at a nuclear power plant. These plans are approved by the NRC in cooperation with the U.S. Department of Homeland Security and the Federal Emergency Management Agency [FEMA]. These approved emergency plans are required for plants to maintain their federal operating license. It is the NRC's role to evaluate the performance of the company's plan while FEMA evaluates the emergency plans of localities near the power plant. If the NRC or FEMA have concerns about plant emergency preparedness, the NRC could suspend plant operation until these concerns are resolved. (**0008-15-1** [Fenwick, Bobby])

Response: *Emergency preparedness capabilities of the proposed facility, evacuation procedures, and evacuation routes are emergency planning issues and are outside the scope of the environmental review. As part of its site safety review, the NRC staff will determine, after consultation with U.S. Department of Homeland Security and Federal Emergency Management Agency, whether emergency plans submitted by the applicant are acceptable. No changes to the EIS were made as a result of these comments.*

E.2.31 Comments Concerning Issues Outside Scope – NRC Oversight

Comment: I just wanted to take a few minutes here today to, first of all, just to point out that right now probably the federal permitting procedure has never had a lower rate of public confidence than what we're seeing as a result of the unfolding catastrophe in the Gulf of Mexico, which is the result of an overly permissive and overly influenced industry of the federal permitting process. And while the Nuclear Regulatory Commission is not the Mineral Management Services, I submit that we have a concern about the spill of nuclear waste not necessarily on this generation, but on future generations. (**0007-8-1** [Gunter, Paul])

Comment: But hopefully, everybody is on the same page. I am a little bit concerned, the gentleman that came up here earlier -- accidentally identified the Nuclear Regulatory Commission as the Nuclear Energy Commission. It's almost like a Freudian slip, per se. And normally I wouldn't have a concern about that and think it's just a minor issue, but with what happened down at the Gulf of Mexico with a regulatory company down there being a little bit too cozy with, you know, BP. And of course, the President, as you know, issued some changes on that. Perhaps we may need to consider that also for nuclear plants as well. (**0008-13-6** [Fedders, Roy])

Comment: Today's public meeting is the seventh the NRC has held in its review of the Calvert Cliffs 3 combined license application. Comments received during NRC's March 19th, 2008 public environmental scoping meeting for the Calvert Cliffs 3 project were addressed and the draft environmental impact statement, which we believe is one of the most comprehensive DEIS reports issued by the NRC today. The 1200-page Calvert Cliffs 3 DEIS report is the culmination of more than two years of review and independent assessment by the NRC of the environmental parameters, including land, air, water, wetlands, ecology, socioeconomic, cultural and historic impacts that are important to assess the environmental suitability of the site for our proposed project and in making a preliminary recommendation that the environmental portion of the Calvert Cliffs 3 combined license application be issued as currently proposed. More than 100 federal, state and local agencies, including Federal agencies, the U.S. Environmental Protection Agency, the Maryland Department of Environment, the Maryland Department of Natural Resources, Calvert County agencies have been involved in NRC's independent review process for the environmental portion of this combined license application for Calvert Cliffs Unit 3. The thoroughness of the NRC review process resulted in 474 requests for additional information. UniStar's responses to these requests for additional information totaled more than 1,300 pages. (**0008-4-1** [Jarmas, Ed])

Comment: I appreciate the hard work of the NRC. You see some of the staff here, but behind them are several more folks, experts across the country who participate in this process and do a very thorough due diligence to make sure that the plant will, indeed, meet the national standards for clean air and clean water, as they've done here in the draft EIS. (**0008-5-3** [Kass, Leslie])

Response: *The NRC takes seriously its responsibility under the Atomic Energy Act of 1954 to protect public health and safety and the environment in regulating the U.S. nuclear power industry. More information on NRC's roles and responsibilities is available on the NRC's* *website at http://www.nrc.gov/what-we-do.html. While the Atomic Energy Act previously defined a role for the Atomic Energy Commission in formulating a national energy policy, the Act, as amended in 1974 by the Energy Reorganization Act created the NRC from the Atomic Energy Commission's regulatory division to regulate the nuclear power industry. The Energy Reorganization Act segregated the Atomic Energy Commission's national policy role in the Energy Research and Development Administration, which later became DOE. The NRC has no role in promoting nuclear power. Rather, the Congress and the President establish the energy policy of the United States, and DOE implements that policy at the direction of the President. The NRC was created by Congress and designed so that it would not report to the same part of the government that was in charge of setting energy policy (any current Administration). The public has been given the opportunity to participate in the rulemaking process that established the regulations that govern its review process. No changes to the EIS were made as a result of these comments.*

E.2.32 Comments Concerning Issues Outside Scope – Safety

Comment: First of all on the safety issue, is that I live next door to that plant. And my wife and my children and my grandchildren, we all live there. And not once have I had a problem about safety on that nuclear plant. (**0007-16-1** [Wilson, Robert])

Comment: [I]t is important for the NRC and the public to understand that the Calvert County Sheriff's Office has no major concern about the expansion of Calvert Cliffs from a public safety standpoint. (**0007-7-2** [Evans, Michael])

Comment: I concur with the draft Environmental Impact Statement that all of these safety features, measures, plans, make up the defense-in-depth philosophy to protect the health and safety of the public and the environment. (**0008-15-3** [Fenwick, Bobby])

Comment: [I]n contrast to the claims of some nuclear opponents, these plants have operated with a remarkable safety record, including the Calvert Cliffs Power Plant. Very safe. (**0008-21-5** [Allison, Kathleen])

Comment: I have absolutely no concerns about the safety of our operating fleet and certainly with the new designs it only gets better. And of course, the dedication of the men and women who keep the lights on working in our plants and their commitment to a safety culture day in and day out that is really unparalleled. (**0008-5-2** [Kass, Leslie])

Comment: Now, the other thing is when I say location, location, location, there is a very possible active earthquake fault in the vicinity and right crossing the Calvert Cliffs Nuclear Power Plant site. It starts from Moran Landing, and it's aligned with Soilers Wharf Road and goes all the way to Mears Cove. (**0007-6-9** [Sevilla, June])

Comment: I understand they took some core samples. I haven't heard what the core samples were for the proposed area of the type of soil that it is. I understand that some part of that area is wetlands, and so I guess they would have to do some correction for the wetlands area. But wetlands typically have a tendency to shift, and that, putting some heavy weight on that with some concrete, I'm concerned about that possibly shifting and creating some problems there. (**0008-13-2** [Fedders, Roy])

Comment: [W]hat would be our defense against the forces of nature, like an earthquake or soil liquefaction because of fractures and inherent weakness in the soil beneath CCNPP, when this condition is exacerbated by massive structures and man-made hazards at Ground Zero? Common sense counsels us that scientific investigation and testing of the plausibly active fault site is the absolutely prudent first step in the prevention of potential catastrophes, especially when such geological condition is the critical geological foundation upon which proposed construction of a nuclear power plant, and a yet uncertified double reactor at that, is being authorized by the Nuclear Regulatory Commission, Maryland State agencies, and the US Army Corps of Engineers. (**0012-1-3** [Sevilla, June])

Comment: It's important to understand, for the public to understand, that the Chernobyl reactor was of a very different design than those in the United States, and that the severity of its accident was due to this risky design. It is literally impossible to have an accident similar to Chernobyl here. Calvert Cliffs Number 3 has been falsely impugned as a Chernobyl on the Chesapeake, and we suggest that the final EIS contain a description of the differences between the design of Chernobyl and water-moderated reactors. (**0007-9-8** [Meadow, Norman])

Comment: In addition to the Draft Environmental Impact Statement, the NRC is in the process of preparing a safety evaluation report for the Calvert Cliffs 3 Project which is currently under review by the Advisory Committee on Reactor Safeguards. This multi-year review process which began in 2008 and is scheduled to be completed in 2012, evaluates the safety portion of the project's combined license application, including the structural design, engineered safety features, site seismology and geotechnical aspects of the project. (**0008-4-9** [Jarmas, Ed])

Response: *The first five comments generally express support for the proposed facility based on the safety of existing nuclear power plants. The next three comments express seismic concerns with regard to proposed facility. Seismologic impacts on the proposed facility are out of scope with regard to the environmental review, but are within scope of the safety-related review. The geologic and seismic information of the site is being reviewed by the NRC staff, and the NRC staff's safety-related review and conclusions will be documented in Section 2.5.1 of the SER. The potential for surface faulting, including the potential for surface deformation due to faulting, will be reviewed and documented in Section 2.5.3 of the SER. The next comment addresses reactor design, and the final comment addresses the SER. The NRC staff's Design Certification Document for the AREVA U.S. EPR reactor and the SER for the proposed Unit 3 will address reactor design and safety in detail. No changes to the EIS were made as a result of these comments.*

E.2.33 Comments Concerning Issues Outside Scope – Security and Terrorism

Comment: I do not have concerns from a safety/security standpoint during the construction phase, because there will be a separate access point for crew and staff for existing Units 1 and 2. (**0007-15-3** [Vaughn, Jackie])

Comment: [T]he first thing about Calvert Cliffs 3 is its undesirable location. It is right next to Dominion Cove Point LNG, the largest marine terminal in the United States. Terrorists target LNG plants and nuclear power plants. (**0007-6-1** [Sevilla, June])

Comment: [T]he security at the plant is already in place and it's working. There is no drawn-out process where you have to build security from the ground up. (**0008-21-7** [Allison, Kathleen])

Response: *Comments related to security and terrorism are safety issues that are not within the scope of the review team's environmental review. The NRC is devoting substantial time and attention to terrorism-related matters, including coordination with the U.S. Department of Homeland Security. As part of its mission to protect public health and safety and the common defense and security pursuant to the Atomic Energy Act, the NRC staff is conducting vulnerability assessments for the domestic utilization of radioactive material. Since the events of September 2001, the NRC has identified the need for license holders to implement compensatory measures and has issued several orders to license holders imposing enhanced security requirements. Finally, the NRC has taken actions to ensure that applicants and license holders maintain vigilance and a high degree of security awareness. Consequently, the NRC will continue to consider measures to prevent and mitigate the consequences of acts of terrorism in fulfilling its safety mission. Additional information about the NRC staff's actions regarding physical security since September 11, 2001, can be found on the NRC's public web site at http://www.nrc.gov. No changes to the EIS were made as a result of these comments.*

E.2.34 General Editorial Comments

Comment: Page 2-164. Reference citation 2008d is redundant with 2008a. (**0003-1-19** [Gray, Susan])

Comment: Section 7.9, Page 7-40, lines 15-17. In Section 7.9, Postulated Accidents, there appears to be a typographical error in the discussion of cumulative impacts within the 50-mile ROI [region of interest]. The reference to the "VCSNS" site should be changed to the "CCNPP" site. (**0004-1-15** [Gibson, Greg] [Lutchenkov, Dimitri])

Response: *These comments are editorial in nature. Section 2.13 and Section 7.9 of the EIS were revised as a result of these comments.*

E.3 References

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

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

40 CFR Part 93. Code of Federal Regulations, Title 40, *Protection of Environment,* Part 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans."

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Appendix F

Key Consultation Correspondence

Appendix F

Key Consultation Correspondence

Table F-1 identifies the consultation correspondence sent and received during the environmental review of the Calvert Cliffs Unit 3 combined license application. Full copies of the National Marine Fisheries Service (NMFS) Biological Assessment and Essential Fish Habitat Assessment are also included in this appendix.

Table F-1. List of Consultation Correspondence

Source	Recipient	Date Accession No.
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	National Marine Fisheries Service (Ms. Patricia Kurkul)	February 29, 2008 ML080370414
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Fish and Wildlife Service (Mr. Dan Murphy)	February 29, 2008 ML080390482
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Maryland Historical Trust (Mr. J. Rodney Little)	February 29, 2008 ML080430656
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Advisory Council on Historic Preservation (Mr. Don Klima)	February 29, 2008 ML080430649
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Pennsylvania Fish and Boat Commission (Mr. Douglas J. Austin)	March 03, 2008 ML080520182
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Cedarville Band of Piscataway Indians, Inc (Chief Natalie Proctor)	March 03, 2009 ML080570335
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Commission on African History and Culture (Ms. Tonya Hardy)	March 05, 2008 ML080570370
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Piscataway Indian Nation (Chief William "Red Wing" Tayac)	March 05, 2008 ML080570294
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Piscataway Conoy Confederacy and Subtribes, Inc. (Tribal Chairman Mervin Savory)	March 05, 2008 ML080510408
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Virginia Department of Game and Inland Fisheries (Mr. Robert W. Duncan)	March 05, 2008 ML080520092

Table F-1. (contd)

Source	Recipient	Date Accession No.
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Maryland Department of Natural Resources (Mr. John R. Griffin)	March 05, 2008 ML080450160
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Virginia Marine Resources Commission (Mr. Steven G. Bowman)	March 05, 2008 ML080520160
U.S. Nuclear Regulatory Commission (Mr. Richard Raione)	Pennsylvania Game Commission (Mr. Carl Roe)	March 05, 2008 ML080520172
U.S. Army Corps of Engineers (Ms. Margaret E. Gaffney-Smith)	U.S. Nuclear Regulatory Commission (Mr. Michael Lesar)	April 11, 2008 ML081130278
Maryland Department of Natural Resources (Ms. Susan T. Gray)	U.S. Nuclear Regulatory Commission (Chief, Rules and Directives Branch)	April 16, 2008 ML081130284
Fish and Wildlife Service (Ms. Mary J. Ratnaswamy)	U.S. Nuclear Regulatory Commission (Ms. Harriet Nash)	May 07, 2008 ML081340645
U.S. Nuclear Regulatory Commission (Mr. Nilesh Chokshi)	U.S. Army Corps of Engineers (Ms. Margaret E. Gaffney-Smith)	June 11, 2008 ML081570139
Maryland Historical Trust (Ms. Dixie Henry)	U.S. Army Corps of Engineers (Ms. Kathy Anderson)	September 25, 2008 ML093630083
Fish and Wildlife Service (Mr. Leopoldo Miranda)	U.S. Army Corps of Engineers (Colonel Peter W. Mueller)	September 30, 2008 ML093630080
National Marine Fisheries Service (Mr. John Nichols)	U.S. Army Corps of Engineers (Ms. Kathy Anderson)	October 3, 2008 ML082910715
Maryland Department of the Environment (Mr. Elder Ghigiarelli, Jr.)	U.S. Army Corps of Engineers (Ms. Kathy Anderson)	October 31, 2008 ML093630082
Maryland Historical Trust (Mr. Rodney Little)	U.S. Army Corps of Engineers (Mr. William Seib)	February 13, 2009 ML090570416
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	New York State Department of Environmental Conservation (Mr. Steve Sanford)	March 17, 2009 ML083400571
New York State Department of Environmental Conservation (Mr. Chuck Nieder)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	April 02, 2009 ML091170694 (email)
U.S. Army Corps of Engineers (Ms. Beth E. Bachur)	Advisory Council on Historic Preservation (Mr. Reid J. Nelson)	July 15, 2009 ML093060235
Advisory Council on Historic Preservation (Mr. Raymond V. Wallace)	U.S. Army Corps of Engineers (Ms. Beth E. Bachur)	July 24, 2009 ML093060220

Table F-1. (contd)

Source	Recipient	Date Accession No.
U.S. Army Corps of Engineers (Ms. Beth E. Bachur)	U.S. Nuclear Regulatory Commission (Mr. Michael Lesar)	July 30, 2009 ML093240035
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Susquehanna River Basin Commission (Mr. Paul Swartz)	October 26, 2009 ML092660186
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Maryland Department of the Environment (Ms. Shari Wilson)	October 26, 2009 ML092660193
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Maryland Department of Natural Resources (Mr. John R. Griffin)	October 26, 2009 ML092660202
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Pennsylvania Game Commission (Mr. Carl Roe)	October 26, 2009 ML092660259
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Virginia Marine Resource Commission (Mr. Steven G. Bowman)	October 26, 2009 ML092660325
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Virginia Department of Game and Inland Fisheries (Mr. Robert W. Duncan)	October 26, 2009 ML092660318
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Pennsylvania Fish and Boat Commission (Mr. Douglas J. Austin)	October 26, 2009 ML092660314
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	National Marine Fisheries Service (Ms. Patricia Kurkul)	October 26, 2009 ML092660237
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Fish and Wildlife Service (Mr. Leopoldo Miranda)	October 26, 2009 ML092660268
Maryland Department of Natural Resources (Ms. Susan T. Gray)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	November 13, 2009 ML093280756
Pennsylvania Fish and Boat Commission (Mr. David Spotts)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	November 16, 2009 ML093290145
Virginia Department of Game and Inland Fisheries (Mr. Ernie Aschenbach)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	December 04, 2009 ML093520692
National Oceanic and Atmospheric Administration (Mr. John Nichols)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	December 10, 2009 ML093520687
Fish and Wildlife Service (Mr. Leopoldo J. Miranda)	U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	February 25, 2010 ML100640429
U.S. Army Corps of Engineers (Ms. Kathy Anderson)	Advisory Council on Historic Preservation (Mr. Reid Nelson)	March 16, 2010 ML100810272
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	U.S. Fish and Wildlife Service (Mr. Leopoldo Miranda)	April 15, 2010 ML100760590

Table F-1. (contd)

Source	Recipient	Date Accession No.
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Maryland Department of Natural Resources (Mr. John R. Griffin)	April 15, 2010 ML100780101
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Maryland Department of the Environment (Ms. Shari Wilson)	April 15, 2010 ML100780061
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Virginia Department of Game and Inland Fisheries	April 15, 2010 ML100780135
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Virginia Marine Resources Commission (Mr. Steven G. Bowman)	April 15, 2010 ML100780160
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Pennsylvania Game Commission (Mr. Carl Roe)	April 15, 2010 ML100780176
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Susquehanna River Basin Commission (Mr. Paul Swartz)	April 15, 2010 ML100780187
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	National Marine Fisheries Services (Ms. Patricia Kurkul)	April 15, 2010 ML100780005
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Advisory Council for Historic Preservation (John M. Fowler)	April 15, 2010 ML100780518
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Maryland Historical Trust (Mr. J. Rodney Little)	April 15, 2010 ML100780329
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Cedarville Band of Piscataway Indians Inc. (Chief Natalie Proctor)	April 15, 2010 ML100820479
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Commission on Africian History and Culture (Ms. Tonya Hardy)	April 15, 2010 ML100980684
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Piscataway Indian Nation (Chief William “Red Wing” Tayac)	April 15, 2010 ML100980650
U.S. Nuclear Regulatory Commission (Mr. Robert G. Schaaf)	Piscataway Conoy Confederacy and Subtribes, Inc. (Tribal Chairman Mervin Savoy)	April 15, 2010 ML100980672
Virginia Dept. of Game and Inland Fisheries (Mr. Ernie Aschenbach)	U.S. Nuclear Regulatory Commission (Chief, Rules and Directives Branch)	April 30, 2010 ML101241198
Maryland Department of Natural Resources (Ms. Susan Gray)	U.S. Nuclear Regulatory Commission (Chief, Rules and and Directives Branch)	July 2, 2010 ML101900427
Virginia Department of Environmental Quality (Ms. Ellie Irons)	U.S. Nuclear Regulatory Commission (Chief, Rules and Directives Branch)	July 7, 2010 ML101970046
U.S. Department of the Interior (Mr. Michael T. Chezik)	U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	July 8, 2010 ML102140110

Table F-1. (contd)

Source	Recipient	Date Accession No.
U.S. Environmental Protection Agency (Mr. Kevin Megarr)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	July 9, 2010 ML101940075
National Marine Fisheries Services U.S. (Mr. Peter D. Colosi, Jr.)	Nuclear Regulatory Commission (Ms. Laura M. Quinn)	August 17, 2010 ML102360364
National Marine Fisheries Services (Mr. Peter D. Colosi, Jr.)	U.S. Army Corps of Engineers (Ms. Kathy Anderson)	August 20, 2010 ML102360363
Virginia Marine Resources Commission (Mr. Jeffrey P. Madden)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	August 24, 2010 ML102460712
U.S. Nuclear Regulatory Commission (Mr. Scott Flanders)	National Marine Fisheries Service (Mr. Peter Colosi, Jr.)	September 17, 2010 ML102530102
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	Virginia Marine Resource Commission (Mr. Joe Grist)	October 7, 2010 ML102640768
Maryland Historical Trust (Mr. Troy J. Nowak)	U.S. Army Corps of Engineers (Mr. Woody Francis)	November 29, 2010 ML103420270
U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	U.S. Fish and Wildlife Service (Mr. Leopoldo Miranda)	January 06, 2011 ML103440066
Maryland Historical Trust (Mr. Jonathan Sager)	U.S Army Corps of Engineers (Mr. Woody Francis)	January 31, 2011 ML110560319
U.S. Fish and Wildlife Service (Mr. Leopoldo Miranda)	U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	February 23, 2011 ML110680437
Maryland Historical Trust (Dr. Dixie Henry)	U.S. Nuclear Regulatory Commission (Ms. Laura Quinn)	March 10, 2011 ML110750313
U.S. Nuclear Regulatory Commission (Ms. Harriet Nash)	National Marine Fisheries Services (Mr. John Nichols and Ms. Julie Crocker)	March 15, 2011 ML110800149
National Marine Fisheries Service (Mr. John Nichols)	U.S. Nuclear Regulatory Commission (Ms. Harriet Nash)	March 15, 2011 ML110800237
National Marine Fisheries Service (Ms. Patricia Kurkul)	U.S. Nuclear Regulatory Commission (Mr. Robert Schaaf)	April 15, 2011 ML111080809

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

May 7, 2008

Harriet Nash
Office of New Reactors
U.S. Nuclear Regulatory Commission
Mail Stop T-6D32
Washington, DC 20555

RE: Evaluation for the Calvert Cliffs Nuclear Power Plant, Unit 3 Combined License Partial Application, Calvert County, MD.

Dear Ms. Nash:

This responds to your letter, received May 2, 2008, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The federally threatened Puritan tiger beetle (*Cicindela puritana*) is known to occur within the vicinity of the above referenced project site. The Puritan tiger beetle occurs along shorelines of the Chesapeake Bay and its tidal tributaries in locations with sandy beaches, often narrow, below high bluffs. The larvae of the beetle live in deep burrows on non-vegetated portions of the bluff face; the adults use both the bluff and the beach below it. Populations have declined due to habitat alterations resulting from shoreline development and shoreline stabilization (bulkheads, revetments, groins, breakwaters). The beetle larvae, in particular, are sensitive to natural and human-induced changes to beaches and bluffs, as well as human traffic and water-borne pollution. Any potential impacts on Puritan tiger beetle habitat should be analyzed as part of your environmental assessment. If such impacts may occur, further Section 7 consultation with the U.S. Fish and Wildlife Service may be required.

The federally threatened northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) is known to occur within the vicinity of the above referenced project site. This beetle is most vulnerable to disturbance in the larval stage, which lasts two years. Larvae live in vertical burrows generally in the beach intertidal zone, where they are particularly sensitive to destruction by high levels of pedestrian traffic, off-road vehicles, and other factors such as beach changes due to coastal development and beach stabilization structures. Any potential impacts on northeastern beach tiger beetle habitat should be analyzed as part of your environmental assessment. If such impacts may occur, further Section 7 consultation with the U.S. Fish and Wildlife Service may be required.

We understand that Unistar Nuclear contracted with Dr. Barry Knisley to conduct tiger beetle studies and evaluate potential impacts of the project, resulting in two reports completed in 2006 and 2007. These studies may provide the necessary information to evaluate the proposed project. We look forward to receiving copies of these reports and any other analysis of impacts on tiger beetles that has been done.

Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered. This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delisted) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle is still protected by the Bald and Golden Eagle Protection Act, Lacey Act, and the Migratory Bird Treaty Act. As a result, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007. If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle Management Guidelines can be found at: **http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.**

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

Mary Ratnaswamy

Mary J. Ratnaswamy, Ph.D.
Program Supervisor, Threatened and Endangered Species

cc: Lori Byrne, Maryland Wildlife and Heritage Division, Annapolis, MD

Habitat Conservation Division
Chesapeake Bay Program Office
410 Severn Ave., Suite 107A
Annapolis, Maryland 21403

October 3, 2008

MEMORANDUM TO: Kathy Anderson
Baltimore District, Corps of Engineers
Regulatory, Maryland Permit – South

FROM: John Nichols

SUBJECT: CALVERT CLIFFS NUCLEAR PROJECT

This pertains to, Public Notice CENABOP-RMS 2007-08123, and your Essential Fish Habitat (EFH) Assessment, dated September 3, 2008, for the proposal by Unistar Nuclear Operating Services to perform site preparation activities and construct supporting facilities at the site of a proposed 1,710 MW nuclear power generation station (Unit 3).

The Nuclear Regulatory Commission (NRC), the lead Federal Agency for this proposal, is preparing an Environmental Impact Statement (EIS) for work associated with the expansion of the power plant facilities. The EIS will contain information important to our ability to make a comprehensive review of the project's impacts on National Marine Fisheries Service resources. Therefore, we wish to defer our final comments on this proposal until following our review of the EIS.

Based on our participation, to date, in the scoping process for this proposal, we have identified several issues of concern, which will be addressed further in our final comments. These issues are as follows.

1. The proposed new Unit 3 intake, relative to its impact from impingement and entrainment of adult, juvenile, and planktonic stages finfish and crustaceans, and other forms of local meroplankton.
2. The proposed new discharge pipe, relative to impacts on benthic habitat during installation, and the thermal quality of its effluent.
3. Restoration of a barge unloading facility, including maintenance and new dredging of an entrance channel, relative to impacts on benthic habitat and natural oyster bar.
4. Nontidal wetland and stream impacts (permanent and temporary) resulting from construction of the new Unit 3 facility and associated infrastructure.

I will be looking forward to further coordination with your agency and NRC, prior to, and following our forthcoming review of the EIS. If you have any questions, please contact me at (410) 267-5675; or, John.Nichols@NOAA.GOV.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
MDE
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

October 31, 2008

Ms. Kathy B. Anderson
Regulatory Branch
Baltimore District, Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203-1715

RE: Water Quality Certification - Unistar/Calvert Cliffs 3 Nuclear Project
USACE Tracking No. NAB-2007-08123-M05

Dear Ms. Anderson:

I am writing with regard to the Section 401 Water Quality Certification (WQC) for the referenced project. As you are aware, the Maryland Department of the Environment continues to review the proposed wetlands and waterways impacts resulting from the project.

The State is currently awaiting the release of the Draft Environmental Impact Statement (DEIS) which is currently scheduled for February, 2009. Upon its release, the Wetlands and Waterways Program will review the DEIS to ensure that the alternatives analysis meets the State's requirements and that proposed impacts to regulated resources have been minimized to the extent practicable.

Assuming the project ultimately satisfies all of Maryland's regulatory requirements, the WQC will be issued as part of the State's wetlands and waterways authorizations. Accordingly, the State reserves its opportunity to issue the WQC and requests that the Corps of Engineers not waive the WQC for the project.

If you have any questions, please contact me at (410) 537-3763.

Sincerely,

Elder Ghigiarelli, Jr.
Deputy Program Administrator
Wetlands and Waterways Program

cc: Gary Setzer
Adam Snyder

www.mde.state.md.us

TTY Users 1-800-735-2258
Via Maryland Relay Service

Maryland Department of Planning
Maryland Historical Trust

February 13, 2009

Mr. William Seib
Chief, Maryland Section Southern
Regulatory Branch, Baltimore District
U.S. Army Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203-1715

Re: MHT Review of Phase II National Register Evaluations and Assessment of Effects for Cultural Resources, Calvert Cliffs Nuclear Power Plant Expansion, Calvert County, Maryland

Dear Mr. Seib:

The Maryland Historical Trust (Trust) has received additional information related to the above-referenced undertaking. The Trust first received notice of the proposed expansion of the Calvert Cliffs Nuclear Power Plant from UniStar Nuclear in October of 2006. Since that time, investigations have been undertaken to identify historic resources that may be within the project's area of potential effect and to assess the effects of the proposed construction on those resources. While other federal agencies will be involved in the regulating and permitting of the eventual operation of the plant, it is our understanding that the Corps is the primary federal agency that will be reviewing and permitting the site preparation activities and the actual construction of the facility. We are therefore writing to the Corps pursuant to Section 106 of the National Historic Preservation Act to continue consultation regarding effects on archeological resources (both terrestrial and underwater) and the historic built environment.

Archeology: The Trust has been provided with copies of the draft reports on the Phase I and Phase II archeological investigations that have been conducted for the above-referenced project. The primary draft report, *Phase I Cultural Resources Investigations and Phase II National Register Site Evaluations, Calvert Cliffs Nuclear Power Plant, Calvert County, Maryland* (Munford et al. 2008) was prepared by GAI Consultants, Inc. and presents the necessary documentation on the goals, methods, results, and recommendations of both Phase I and Phase II investigations that have been conducted within the project area. The document is notably well-organized and well-written and is consistent with the reporting requirements of the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). Please note, however, that the following items must be addressed in the preparation of the final document:

- The title for Figure 1-1 (Project Area) should include the appropriate quadrangle name (Cove Point).
- The report should specify that all materials remains and field records generated by the investigations will be deposited with the Maryland Archeological Laboratory for long-term preservation.

100 Community Place • Crownsville, Maryland 21032-2023
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Internet: www.marylandhistoricaltrust.net

- While the report acknowledges that site 18CV474 has the potential to address research questions relating to Maryland's slave economy, transformations following emancipation, and domestic agricultural sites in the nineteenth century, it may be helpful to include a list of more *specific* and more detailed research questions that could be explored through further investigation of this site.

As noted in our letter dated June 7, 2007, Phase I survey work resulted in the identification of fourteen archeological sites, and the Trust recommended that Phase II evaluative studies be conducted at four of these sites (18CV474, 18CV480, 18CV481, and 18CV482) to evaluate the resources in terms of their eligibility for the National Register of Historic Places. The Phase II investigations were carried out between March and May of 2008 and consisted of the excavation of 961 additional shovel test pits and 46 test units. Sites 18CV481 and 18CV482 have both been identified as late nineteenth century domestic sites. Both sites have been heavily disturbed by mechanical earth-moving activities, and GAI has recommended that the two sites are not eligible for listing in the National Register of Historic Places. Based on the information presented in the draft report, we concur that sites 18CV481 and 18CV482 do not meet the criteria for eligibility in the National Register given their loss of integrity and inability to yield any additional information. Further investigations of these two sites are not warranted.

Site 18CV480 represents the location of the former Parran's Park farmstead (CT-58) – a mid-nineteenth to twentieth century landowner's domestic complex that was demolished by BG&E in 1972. A total of 24, 938 artifacts have been recovered from the site, including a variety of historic ceramics (predominantly undecorated whiteware, but also transfer print, hand-painted, edge decorated, and sponge decorated whiteware), glassware, cut nails, brick fragments, window glass, porcelain doll fragments, glass marbles, buttons, coins, combs, medicine bottles, and tobacco pipe fragments. The remnants of seventeen cultural features were also identified, including a deep pit feature, five stone wall or pier sections, and several postholes/molds. Despite the high density of artifacts and the presence of partial features, the Phase II investigations have clearly revealed that the site has been heavily impacted by modern activities. The area where the house once stood was evidently bulldozed and graded when the structure was razed, and other areas have been excavated and used as borrow sites during the construction of the existing power plant. Due to the significantly reduced integrity of the site, GAI has recommended that site 18CV480 is not eligible for listing in the National Register. Based on the information presented in the draft report, we concur that site 18CV480 does not meet the criteria for eligibility in the National Register given its loss of integrity and inability to yield any additional information. Further investigation of this site is not warranted.

Site 18CV474, on the other hand, has been identified as a mid-nineteenth to early-twentieth century domestic site possessing remarkably good integrity. A total of 3,644 artifacts have been recovered from the site, including a variety of temporally diagnostic ceramics (pearlware, yellowware, and whiteware), bottle glass, cut nails, brick fragments, window glass, lamp chimney glass, buttons, tobacco pipe fragments, and a glass bead. Four intact features have also been identified, including a stone foundation and chimney base, a builder's trench, an area of stone paving, and a possible pier support for a north addition. The temporally diagnostic artifacts and cartographic sources indicate that this site was occupied from ca. 1850 to 1910, and the limited quantity and variety of decorated ceramics suggests that the residents were of a lower socioeconomic status than the landowners who were residing at site 18CV480. The property encompassing these sites was, in fact, owned and occupied by the Somervell family during the eighteenth and nineteenth centuries, and census data indicates that this locally prominent family relied heavily on enslaved labor throughout the first half of the nineteenth century. The Slave Schedule of the 1860 census, for example, identifies Alexander Somervell as the owner of 52 slaves, and Charles Somervell (Alexander's son) as the owner of sixteen slaves. Housing for these slaves may have been dispersed throughout the Somervell plantation, and the archeological investigations conducted at site 18CV474 indicate that the site may represent one such residence for some of the slaves and/or tenants, sharecroppers, or freed African Americans.

As noted above, site 18CV474 has retained much of its integrity and has the potential to yield significant information regarding domestic agricultural sites in nineteenth century southern Maryland. Specifically, additional archeological investigations may be able to address research questions relating to Maryland's slave economy and the wide variety of transformations that took place following emancipation. GAI has therefore recommended that site 18CV474 is eligible for listing in the National Register under Criterion D and that, if possible, the site should be preserved in place. Based on the information presented in the report, we concur that site 18CV474 is indeed eligible for inclusion in the National Register.

The expansion of the Calvert Cliffs Nuclear Power Plant, as currently proposed, would result in the destruction of site 18CV474 and would constitute an adverse effect on this significant archeological resource. To continue the Section 106 consultation process, the Corps of Engineers and UniStar Nuclear Development will need to continue to coordinate with the Trust on ways to avoid or mitigate the adverse effect on the site. If site avoidance is not possible, UniStar will need to provide the Trust with documentation detailing the constraints and providing justification as to why site 18CV474 cannot be avoided during construction. If site avoidance is not possible, Phase III data recovery investigations will be warranted to mitigate the undertaking's adverse effects on the archeological property. All parties will need to negotiate and execute a Memorandum of Agreement (MOA) that stipulates the agreed-upon mitigation measures, including the Phase III investigations, methods of public outreach and interpretation, and the curation of all artifacts and materials generated by the investigations conducted at site 18CV474. The Trust must be provided with a draft Data Recovery Plan for site 18CV474 so that we may provide appropriate comments and recommendations. Following our review and approval of the Data Recovery Plan, we will be happy to draft an MOA for the purposes of review and comment.

Please note that a supplemental Phase I Cultural Resources Investigation report was submitted to our office by UniStar on February 9, 2009. This document provided a summary of the methods, results, and recommendations of Phase I archeological investigations that were carried out at three new localities (Preston's Cliffs Wetland Mitigation Area, Camp Conoy Wetland Mitigation Area, and the Old Bay Farm Access Road). In short, the supplemental Phase I survey identified an extension of a previously-recorded site – 18CV7. This site represents an early nineteenth to twentieth century domestic component associated with the National Register eligible Preston's Cliffs Farmstead (CT-59). We understand that the portion of site 18CV7 that was most recently recorded by GAI is located within the Preston's Cliffs Wetland Mitigation Area and may be impacted by tree planting activities. GAI has recommended either site avoidance or further (Phase II) archeological investigations to evaluate the site's National Register eligibility prior to these activities. It is our opinion, however, that a Phase II study of the portion of site 18CV7 that is to be impacted would not be meaningful or appropriate at this time, as the purpose of a Phase II investigation is to evaluate an archeological resource in its *entirety* and to provide a definitive statement regarding the overall site's integrity, significance, and National Register eligibility. We are therefore recommending that the area containing a portion of site 18CV7 be reforested through the hand-planting of seedlings, as this practice is unlikely to have an adverse effect on the potentially significant nineteenth-century archeological resource. Please provide our office with a copy of the wetland mitigation plan and map (including proposed planting techniques) for the Preston's Cliffs Wetland Mitigation Area for our review, when this information becomes available. If UniStar is unable to utilize the hand-planting of seedlings technique in the area of site 18CV7, then further consultation regarding potential impacts to this site will be necessary.

Underwater Archeology: On January 20, 2009, the Maryland Historical Trust (Trust) received a copy of the draft report on the Phase I underwater archaeological survey that was conducted for the above-referenced project. The document was prepared by Panamerican Consultants, Inc, and prepared for MACTEC Federal Programs, Inc. We have reviewed the draft report in accordance with Section 106 of the national Historic Preservation Act of 1966, as amended, and are writing to provide our comments regarding effects on historic and archeological properties.

The draft report, *Submerged Cultural Resources Survey of a Proposed Outfall Pipe, Calvert Cliffs Nuclear Power Plant Unit 3 Construction, Calvert County, Maryland* (Faught 2008), is not consistent with the reporting requirements of the Trust's *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994) and will require revisions before the report can be accepted.

The Phase I survey was carried out during March of 2008 and consisted of an electronic remote-sensing survey within the proposed project area utilizing side-scan sonar, magnetometer, and sub-bottom profiler. Although the Maryland Inventory of Historic Properties records no known historic resources within the project area, the dredging activity has the potential for destroying currently unknown archeological, scientific, prehistoric, or historical data. While the draft Phase I report states that "none of the magnetic anomalies or side-scan targets are considered potentially significant for the purpose of this investigation", the Trust feels that the author of the report failed to adequately illustrate the lack of significance with clear figures and data. The lack of a clearly defined project APE within the report also hampered the Trust's ability to determine which of the targets might be impacted by the proposed construction of the outfall pipe. Much of the surveyed area appears well south of the proposed outfall pipe. The Trust is also confused by the use of 100-ft lane spacing, when the Trust often requires 50-ft lane spacing in submerged cultural resource surveys to ensure complete coverage and adequate resolution of the magnetic anomalies that might represent historic wrecks or other archeological resources. Specific comments and recommendations will follow.

Based on the documentation presented in this report, we concur that the proposed outfall pipe construction is unlikely to impact any significant cultural resources. For this reason, we believe that the portion of the Calvert Cliffs Nuclear Power Plant that includes the Proposed Outfall Pipe possesses no archeological research potential and that further archeological investigations are not warranted for Section 106 purposes. If the proposed outfall pipe is realigned, per the report recommendations, further consultation will be required and a resurvey of the area might be requested. The Section 106 requirements for this particular undertaking have, in fact been fulfilled. We look forward to receiving two copies of the final report, revised to address the Trust's comments, for our library.

Specific Comments:

- All maps should contain a North Arrow and a Scale
- P. 1 Introduction. The survey area should be stated in acres and hectares.
- P. 3 Environmental Setting: No evidence is provided for the statement, "The geologic beds of the cliffs (eroded portions of old sediment beds) apparently continue underwater according to the sidescan record."
- P. 4 figure 4 requires a citation

- P. 7- 8 Methods: magnetometer - section needs to include the coverage of the magnetometer and the height towed above the seafloor.
- P. 12 Methods: GIS Mapping Locational Controls and Analysis – the bathymetric map referenced in this section was not included in the report
    - Figure 12– it would be helpful if a background image of the marine chart/USGS quad was included behind the track lines and magnetic data.
- P. 13-19 Results Section
    - There is not enough information in this section of the report to independently verify the author's results
        - M06, in particular, needs to be described in more detail, and the rationale for dismissing this object, which has a relatively large amplitude and long duration and is described as a complex dipole.
        - Higher resolution images of side-scan targets 1 – 4 need to be included for completeness, and so that the Trust can assess these objects.
        - Fig. 17-18 - it would be helpful if a background image of the marine chart/USGS quad was included behind the mosaics.
        - The results section references a paleochannel feature identified with the subbottom profiler, but there is no direct evidence of the presence of the paleochannel other than the green shading included on Figure 18. The section on the presence and interpretation of the paleochannel needs to be included so that individuals reading the report can clearly and independently verify its presence.

Historic Built Environment: Investigations to identify historic buildings, structures, and landscapes that might be affected by the proposed power plant expansion identified four places that are eligible for listing in the National Register of Historic Places. Parran's Park (CT-58) and Preston's Cliffs (CT-59) contain tobacco barns that are significant for their association with agricultural history. The Drum Point Railroad Bed (CT-1295) is significant for its association with local history and engineering. Camp Conoy (CT-1312) is significant for its association with important trends in recreational and social history.

The Trust has reviewed the recommendations in the report *Letter Report, Criteria of Effects Evaluation, Calvert Cliffs Nuclear Power Plant*. The report finds that the proposed power plant expansion will not adversely affect Parran's Park or Preston's Cliffs. The report also finds that the proposed work will require the alteration and demolition of portions of the Drum Point Railroad Bed and Camp Conoy. The Trust agrees that these changes would constitute an adverse effect to historic properties.

In the event of an adverse effect finding, 36 CFR 800.6 requires the responsible agency to continue consultation with the Trust, other interested parties, and the general public to identify and consider alternative plans that can avoid; minimize; and, if necessary, mitigate adverse effects. Interested parties should include the county government and local history groups. Examples of efforts to minimize adverse effects include using vegetative buffers to minimize visual effects and moving, rather than demolishing, historic buildings. Examples of efforts to mitigate adverse effects include documentation and the study, survey, or repair of historic resources that are similar to those that must be demolished.

We recommend that the Corps's applicant proceed with the Section 106 process by consulting with as broad a range of interested parties as practical and compiling their recommendations about the best ways to avoid, minimize, and mitigate the adverse effects of the undertaking. As noted above, once the results of this consultation and detailed information about the nature of the adverse effects are provided to the Trust, the Trust will provide a draft MOA to the Corps and UniStar for review and consideration.

Thank you for providing us with this opportunity to comment. If you have questions or require assistance, please contact Dixie Henry (regarding terrestrial archeology) at 410-514-7638 \ dhenry@mdp.state.md.us, Jonathan Sager (regarding historic buildings and landscapes) at 410-514-7636 \ jsager@mdp.state.md.us, or Brian Jordan (regarding underwater archeology) at 410-514-7668 \ bjordan@mdp.state.md.us.

Sincerely,

J. Rodney Little
Director \ State Historic Preservation Officer
Maryland Historical Trust

JRL\DLH\JES
200803669
CC: Kathy Anderson (COE)
Susan Gray (PPRP)
R. McLean (DNR)
Yvonne F. Abernethy (Constellation Energy)
Dimitri Lutchenkov (UniStar)
Ben Resnick (GAI)
Barbar A. Munford (GAI)
Kirsti Uunila (Calvert County)

Preserving America's Heritage

July 24, 2009

Ms. Beth E. Bachur
Acting Chief, Maryland Section Southern
Baltimore District, U.S. Army Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203-1715

Ref: Proposed Calvert Cliffs Nuclear Power Plant Project
Calvert County, Maryland

Dear Ms. Bachur:

On July 17, 2009, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the adverse effects of the referenced project on properties listed on and eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases,* of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Maryland SHPO and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the opportunity to review this undertaking. If you have any questions, please contact Tom McCulloch at 202-606-8554, or via email at tmcculloch@achp.gov.

Sincerely,

Raymond V. Wallace

Raymond V. Wallace
Historic Preservation Technician
Federal Property Management Section
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 803 Washington, DC 20004
Phone: 202-606-8503 ▯ Fax: 202-606-8647 ▯ achp@achp.gov ▯ www.achp.gov

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF

JUL 30 2009

Operations Division

Mr. Michael Lesar
Chief, Rules and Directives Branch
Division of Administrative Services
Mailstop T6-D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Lesar:

This is in reference to the Phase I Mitigation Plan for the Department of the Army (DA) permit application NAB-2007-08123-M05 (Calvert Cliffs 3 Nuclear Project, LLC/Unistar Nuclear Operating Services, LLC) to construct the proposed Calvert Cliffs Nuclear Power Plant Unit 3 in the Chesapeake Bay and unnamed tributaries to the Chesapeake Bay, forested non-tidal wetlands, Johns Creek and Goldstein Branch and their unnamed tributaries at Unistar's Calvert Cliffs site near Lusby, Calvert County, Maryland.

We have reviewed the Phase I Mitigation Plan dated February 18, 2009, and find that the proposal to enhance one manmade, abandoned sediment basin within the Lake Davies Disposal Area; to enhance portions of Johns Creek; to create forested and herbaceous wetland habitat within the largest manmade, abandoned, sediment basin on the Lake Davies disposal area; to create forested wetland habitat within the Camp Conoy area; to construct stream restoration; and to construct stream enhancement is conceptually acceptable as a suitable methodology to provide compensatory mitigation for the proposed project impacts to Waters of the U.S., including jurisdictional wetlands.

The proposed wetland mitigation includes creation of approximately 0.9 acres area of open water pond habitat; 1.3 acres of freshwater marsh; 7.2 acres of bottomland hardwood forest; eradication of invasive vegetation and enhancement of approximately 2.4 acres of bottomland hardwood forest; enhancement of wetlands abutting Johns Creek by eradication of invasive vegetation and enhancement of approximately 15.7 acres of bottomland hardwood forest; and creation of approximately 4.6 acres of forested wetland habitat. The proposed stream mitigation includes restoration of stream functions along approximately 6,283 linear feet of stream portions by employing treatments such as instream habitat structures (cover logs, lateral/longitudinal diversity and root wads); bank stabilization (vegetative and bioengineering solutions); and riparian wetland enhancements (hydraulic and vegetative). The proposed stream mitigation also includes enhancement of a total of approximately 4,146 linear feet of specific stream portions by improving aquatic habitat, constructing bank stabilization and planting native riparian vegetation. These proposed compensatory mitigation projects must be monitored for a 5-

year period and must be protected in perpetuity through establishment of a legally binding long-term protection mechanism. The final mitigation plan must comply with the U.S. Army Corps of Engineers Regulatory Guidance Letter No. 08-03 (Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving the Restoration, Establishment and/or Enhancement of Aquatic Resources, dated October 10, 2008). The Final Mitigation and Monitoring Plan should be an update of the Phase I Mitigation Plan based on actual field survey conditions and qualitative/quantitative data. In addition, the Final Mitigation and Monitoring Plan should include final construction design plans and the following:

1. Content of the final compensatory mitigation plan must be based on the final proposed project impacts and results of the ground truth surveys and analysis.
2. Detailed explanation for any deviations from the Phase I plan.
3. Detailed short-term and long-term plans to control *Phragmitis australis* (common reed) within and in the vicinity of the proposed wetland and stream creation, enhancement and restoration areas before, during and after the proposed mitigation work.
4. A summary of the various assessment methods or analytical models used and definition of the basis for the ratings or criteria.
5. A description of upland conditions on site that could have a detrimental impact on the mitigation areas and a description of work in uplands on site that could ameliorate future potential impacts to mitigation areas.
6. A declaration and a plan sheet illustration showing that work in the 100-foot wide stream mitigation area centered at the confluence of the stream with the Chesapeake Bay will be restricted from June 1 through August 31, inclusive of any year, to avoid impacts to tiger beetle habitat.
7. A declaration that only wetland vegetation species that are native and non-persistent will be planted in the wetland mitigation areas
8. A declaration ensuring the wetland and stream creation, enhancement and restoration areas continue to function as wetlands as defined in the Corps Wetland Delineation Manual (87 Manual) (i.e., the areas must exhibit wetland hydrology, hydric soils and a predominance of hydrophytic vegetation) and the streams continue to function as designed after work is completed.
9. A declaration that the wetland creation and enhancement areas will be field checked to ensure that elevations will achieve the hydrology necessary to support the plants species proposed for planting in those areas. If the wetland creation and enhancement areas do not thrive, the reasons for failure will be determined; corrective measures will be taken and the area replanted.
10. A signed document that ensures appropriate financing will be set aside to cover the estimated potential costs of remediation for the compensatory mitigation projects if stipulation number 8 above is not accomplished as required by the Corps.

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In addition, Calvert Cliffs 3 Nuclear Project, LLC/Unistar Nuclear Operating Services, LLC must provide a draft restrictive covenant document for permanent conservation easements on the wetland and stream creation, enhancement and restoration areas to the Corps at least 45 days prior to completion of the Final Mitigation and Monitoring Plan. Once the document is approved by the Corps, a copy of the signed document and confirmatory evidence that the said documents have been filed in the land records of the appropriate County must be included in the Final Mitigation and Monitoring Plan.

A copy of this letter will be furnished to Ms. Laura Quinn, NRC, Ms. Cheryl Kerr, MDE, Mr. Michael Milbradt, Calvert Cliffs 3 Nuclear Project, LLC, and Mr. Dimitri Lutchenkov, Unistar Nuclear Operating Services, LLC. If you have any questions concerning this letter, please call Mrs. Kathy Anderson, of this office, at (410) 962- 5690.

Sincerely,

Beth E. Bachur

Beth E. Bachur
Acting Chief, Maryland Section Southern

3

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Eric Schwaab, Deputy Secretary

November 13, 2009

Ms Laura Quinn, Environmental Program Manager
Office of New Reactors
US Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: INFORMATION REQUEST AND CONSULTATION REGARDING THE COMBINED LICENSE APPLICATION FOR CALVERT CLIFFS NUCLEAR POWER PLANT UNIT 3

Dear Ms. Quinn:

This letter responds to Mr. Robert Schaaf's letter of October 26, 2009 to Secretary Shari Wilson, of the Maryland Department of the Environment, regarding the combined license application for Calvert Cliffs Nuclear Power Plant Unit 3.

As you know, the State of Maryland is participating as an Interested State in the subject case. The State lead is the Power Plant Research Program, who has been actively engaged in the process, including participating in the recent site visits to Eastalco and Bainbridge.

In 2007, UniStar applied to the Maryland Public Service Commission (PSC) for a Certificate of Convenience and Necessity (see http://webapp.psc.state.md.us; select Case 9127). Pursuant to the case, the State of Maryland undertook an environmental review process similar to the one the NRC is currently undergoing. The Maryland Department of Natural Resources, the Maryland Department of the Environment, as well as 5 other executive branch State agencies, conducted a coordinated, consolidated review of the Calvert Cliffs Unit 3 project. The review resulted in recommending almost one hundred licensing conditions to the PSC. The PSC approved the project on June 26, 2009, and these conditions, in their final form, are presented in items 114 and 139 of the PSC 9127 case jacket. In particular, please note Conditions 43-53, which cover terrestrial and ecological aspects, including threatened and endangered species.

With regard to alternative site evaluation, Maryland no longer requires alternative siting studies as a part of our power plant evaluations. However, PPRP has conducted site specific evaluations at the Bainbridge site as well as the Eastalco site. The Environmental Review Documents related to these two sites were provided to Ms. Maryann Parkhurst of your evaluation team shortly after the Bainbridge and Eastalco site visits. Although these evaluations were done based on other

Tawes State Office Building • 580 Taylor Avenue • Annapolis, Maryland 21401
410.260.8DNR or toll free in Maryland 877.620.8DNR • www.dnr.maryland.gov • TTY users call via Maryland Relay

power plant designs, we believe they provide an excellent overview of general site conditions, including terrestrial and aquatic ecology. We have not conducted any studies of the Thiokol site.

We appreciate the opportunity to provide you with feedback on these and other important matters. If you have any questions, please give me call (410-260-8661) or send me an email (sgray@dnr.state.md.us).

Sincerely,

Susan T. Gray
Manager, Nuclear Programs
Power Plant Research Program

cc: Shari Wilson, Secretary MDE
Bill Paul, Chief, ARMA
Pete Dunbar, Director, PPRP
Brent Hare, AAG
Brent Bolea, AAG

Habitat Conservation Division
Chesapeake Bay Program Office
410 Severn Ave., Suite 107A
Annapolis, Maryland 21403

December 10, 2009

MEMORANDUM TO: Laura Quinn
Environment Projects Branch 3
Nuclear Regulatory Commission

FROM: John Nichols

SUBJECT: Calvert Cliffs Nuclear Power Plant, Unit 3
Alternative Sites Analysis

This pertains to your request, dated October 26, 2009, for information on National Marine Fisheries Service (NMFS) trust resources, and NMFS regulatory review issues that should be considered in evaluating three alternative sites the Environmental Impact Statement (in preparation) for the proposed Calvert Cliffs Nuclear Power Plant, Unit 3, in Calvert County, Maryland. The three alternative sites (all in Maryland) include: 1) the Bainbridge Site, in Port Deposit, Cecil County; 2) the Thiokol Site, near Mechanicsville, St. Mary's County, and; 3) the Eastaclo Site, in Frederick County. I have provided the following information.

Bainbridge Site
Of the three alternative sites, Bainbridge is of highest value to living marine resources under NMFS purview. The Susquehanna River is a documented migratory corridor and/or spawning/nursery ground for several species of anadromous and catadromous fish, including striped bass, white perch, yellow perch, alewife, blueback herring, hickory shad, American shad, and American eel. Generally firm/hard bottom along the Port Deposit shoreline provides ideal habitat for anadromous species with demersal eggs (deposited on, and adhering to bottom substrate); i.e., alewife, blueback herring, hickory shad, and American shad.

The Port Deposit shoreline is also a historically important area for submerged aquatic vegetation (SAV). Dense, multi-species beds occur annually at Marina Park in Port Deposit, extending channelward up to 100 feet from the mean high water shoreline. SAV significantly enhances nursery ground values for the above anadromous species. Virginia Institute of Marine Science annual aerial SAV surveys for the Chesapeake Bay (Havre de Grace Quad) should be referenced to determine historical occurrence and distribution of SAV along the Port Deposit shoreline.

Power plant cooling water intakes, such as that which would be required for a nuclear facility at Bainbridge, can jeopardize reproductive potential of spawning anadromous fish through impingement and entrainment of eggs and larvae. It is preferable that such intakes **not be sited** within anadromous fish spawning grounds. Where spawning ground locations are unavoidable, NMFS recommends strict intake design criteria to minimize egg and larvae mortality, including the following measures.

1. Wedge wire screening on intake openings, preferably with 1 mm mesh size, but not greater than 2mm mesh size. Back-flush mechanisms are generally required to maintain the latter small-mesh screening free from clogging.
2. Intake velocities which do not exceed 0.5 feet per second.
3. Recessed intakes, constructed off the main waterway, which are less accessible to anadromous fish life stages.

Dredging of an intake channel for a Bainbridge Power Plant intake, required to maintain adequate flow velocities and volumes, would also permanently convert hard bottom and SAV bed to fine-grain unvegetated substrate, of lower value to anadromous fish reproductive activities.

The Susquehanna River at Port Deposit is essentially freshwater riverine, near the head of tidal influence, and upstream of Essential Fish Habitat, as designated under the Magnuson-Stevens Fishery Conservation & Management Act (MSA). Consequently, selection of the Bainbridge site would not directly affect federally managed species under MSA, such as bluefish and summer flounder. However, anadromous fish that spawn in the Port Deposit area are important prey for bluefish and summer flounder in the Chesapeake Bay, and impacts to the reproductive potential of these prey species would indirectly affect managed predatory species. While addressing the impacts of the Bainbridge site under MSA consultation is not required, it is recommended, because of the importance of the lower Susquehanna to anadromous prey species. Addressing of the Bainbridge site under MSA consultation could be included as an addition to the Essential Fish Habitat assessment currently being prepared by your agency for the Calvert Cliffs site.

The lower Susquehanna River below Conowingo Dam has been determined to be important forage habitat for the endangered shortnose sturgeon, and may also support spawning activity for this species. Your agency should contact Julie Crocker of our Protected Resources Division in Gloucester, MA; (978) 281-9328; ext. 6530, or Julie.Crocker@NOAA.GOV, to determine your Section 7 consultation responsibilities for the Bainbridge site under the Endangered Species Act.

Thiokol Site
Withdrawal of cooling water from the Patuxent River would our agency's primary concern with selection of the Thiokol Site. Such an intake would be located downstream of the anadromous fish spawning grounds in the river. However, juveniles and adults of anadromous species seasonally migrate through the lower Patuxent River, including striped bass, white perch, yellow perch, alewife, and blueback herring. The latter life stages are mobile, pelagic in occurrence, and would, to a lesser degree than eggs and larvae, be susceptible to impingement and entrainment from a cooling water intake.

Other commercially important estuarine species that forage and nursery in the lower Patuxent River, which would be susceptible to impingement and entrainment from a cooling water intake, include blue crab, spot, croaker, weakfish, menhaden, American eel, winter flounder; and, veliger larvae of American oysters, produced by adult oysters on Natural Oyster Bars (NOB). A cooling water intake should located as far as possible away from NOBs, to minimize oyster larvae mortality.

Annual salinities in the Jack Bay area of the lower Patuxent River range from 9 to 13 ppt, and the lower Patuxent River has been designated as EFH for several federally managed species under MSA. Based on species ecology and salinity tolerances, federally managed species that occur in the lower Patuxent River include adult and juvenile bluefish, and adult and juvenile summer flounder. A bottom oriented intake would increase susceptibility of summer flounder to impingement/entrainment, and should be factored into impact considerations for this site. Addressing potential impacts to EFH and managed species from a cooling water intake in the lower Patuxent River could be as an expansion of the EFH assessment currently in preparation for the Calvert Cliffs site.

The Thiokol site lies along the drainage divide between the Patuxent and Potomac Rivers. Nontidal streams associated with the site are headwater systems, such as Tom Swamp Run and Rich Neck Creek, tributaries to McIntosh Run. Both streams likely provide nursery/forage ground for female American eel. White perch and yellow perch spawning grounds occur downstream of the Thiokol Site, and would be indirectly affected by adverse changes to the hydrology of upstream tributaries resulting from development of the site.

Eastaclo Site
The Potomac River drainage in Frederick County lies upstream of Great Falls, a natural barrier to migratory fish, with the exception of American eel. Due to limited manpower, NMFS Habitat considers the Potomac River above Great Falls as a No Resources area, and does not participate in regulatory review of projects located in the upper Potomac drainage. We, therefore, have no resource or regulatory input for the Eastaclo Site.

If you have any questions, or additional information needs, please contact me at (410) 962-5675; or, John.Nichols@NOAA.GOV.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

January 28, 2010

United States
Nuclear regulatory commission
Washington, D.C. 20555-0001

RE: Information and Consultation request regarding the combined license application for Calvert cliffs Nuclear Power Plant Unit 3

Dear: Robert G. Schaaf

This responds to your letter, received November 16, 2009, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The federally threatened bog turtle (*Clemmys muhlenbergii*) may be present within the project area or within the vicinity of the project. Bog turtles primarily inhabit palustrine wetlands comprised of a muddy bottom or shallow water, and tussocks of vegetation. A survey for bog turtle habitat and bog turtles may be appropriate. These surveys should be conducted at any location where the Maryland Wildlife and Heritage Division recommends. Upon completion, survey reports should be forwarded to both the Service and the Maryland Wildlife and Heritage Division for review. If you have not already sent a copy of your request for threatened and endangered species information to the Maryland Department of Natural Resources Wildlife and Heritage Division (580 Taylor Avenue, E-1, Annapolis MD 21401), please do so. Ms. Lori Byrne of the Wildlife and Heritage Division will provide additional information regarding the need for surveys and a list of experts who are qualified to perform such surveys.

Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delist) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle will still be protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. As a result, starting on August 8, 2007, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle Management Guidelines can be found at:
http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

Leopoldo Miranda
Field Supervisor

cc: Lori Byrne, Maryland Wildlife and Heritage Division, Annapolis, MD

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573-4575

February 25, 2010

Mr. Robert G. Schaaf
United States
Nuclear regulatory commission
Washington, D.C. 20555-0001

RE: New alternative sites in Maryland for Calvert cliffs Nuclear Power Plant Unit 3: Bainbridge Naval Training Facility site, Cecil County; Thiokol site, St. Mary's County; Eastalco site, Frederick County.

Dear Robert G. Schaaf:

This responds to your letter, received November 16, 2009, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the above referenced project areas and your February 12, 2010, request for more specific information concerning these alternative sites. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The federally threatened bog turtle (*Clemmys muhlenbergii*) may be present within the project area or within the vicinity of the Bainbridge Naval Training Facility site. Bog turtles primarily inhabit palustrine wetlands comprised of a muddy bottom or shallow water, and tussocks of vegetation. A survey for bog turtle habitat and bog turtles may be appropriate. These surveys should be conducted at any location where the Maryland Wildlife and Heritage Division recommends. Upon completion, survey reports should be forwarded to both the Service and the Maryland Wildlife and Heritage Division for review. If you have not already sent a copy of your request for threatened and endangered species information to the Maryland Department of Natural Resources Wildlife and Heritage Division (580 Taylor Avenue, E-1, Annapolis MD 21401), please do so. Ms. Lori Byrne of the Wildlife and Heritage Division will provide additional information regarding the need for surveys and a list of experts who are qualified to perform such surveys.

The Federally endangered dwarf wedge mussel (*Alasmidonta heterodon*) may be present within the area affected by the development of the Thiokol site. This freshwater mussel occurs in McIntosh Run and may be affected by changes in flow or water quality in tributary streams which originate near the Thiokol site.

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the vicinity of the Eastalco site.. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delist) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle will still be protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. As a result, starting on August 8, 2007, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle Management Guidelines can be found at:
http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

June Slac

For ~~Leopoldo~~ Miranda
Field Supervisor

cc: Lori Byrne, Maryland Wildlife and Heritage Division, Annapolis, MD

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO ATTENTION OF

MAR 16 2010

Operations Division

Mr. Reid J. Nelson, Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
Old Post Office Building, Suite 803
1100 Pennsylvania Avenue, N.W.
Washington, DC 20004

Dear Mr. Nelson:

I am writing to conclude the review by the U.S. Army Corps of Engineers, Baltimore District (Corps) in consultation with the Maryland State Historic Preservation Officer (MD SHPO), regarding the Department of the Army (DA) application CENAB-OP-RMS (Calvert Cliffs 3 Nuclear Project, LLC/Unistar Nuclear Operating Services, LLC)2007-08123, pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended.

In a letter dated July 15, 2009, (Enclosure 1) and in consultation with the MD SHPO, we notified you that the proposed undertaking would have an adverse effect on historic properties in accordance with 36 CFR 800.6(a) (1). We also provided documentation referenced in 36 CFR 800.11(e): *Finding of no adverse effect or adverse effect.*

There have been no substantive revisions or additions to previous documentation provided to your office regarding this project. However, the Corps, the MD SHPO and the permit applicant have entered into a Memorandum of Agreement (MOA) to resolve the adverse effects associated with this undertaking. As described in the subject MOA, the applicant, in consultation with the Corps and MD SHPO, has agreed to implement cultural resource studies for ancillary environmental stewardship opportunities, reforestation activities, or other modifications to the previously reviewed Project for which cultural resource studies have not been completed, even though such treatment may exceed the Corps' scope of authority as published in Appendix C, and has participated in the consultation, has responsibilities for implementing stipulations under the Memorandum of Agreement ("MOA"), and is a concurring party to this MOA. The Corps, and the MD SHPO agree that the requirement for appropriate public notice and involvement stated in 36 CFR 800.14 (b) (2) (ii) is satisfied by a combination of past public notice and public and agency hearings and reviews, which includes consideration of the Project's effects on historic properties. All of the parties to the MOA are satisfied that the stipulations in the MOA successfully take into account the effect of the project on historic properties. As further described in the MOA, the public was provided the opportunity to comment on the DA application CENAB-OP-RMS (Calvert Cliffs 3

Nuclear Project, LLC/Unistar Nuclear Operating Services, LLC) 2007-08123 by public notice dated September 3, 2008. No comments were received from the public on this project. Finally, by letter dated July 24, 2009, the Advisory Council on Historic Preservation declined to participate in the Section 106 consultation regarding this project, by advising the Corps that further participation and consultation, to resolve adverse effects, was not needed, (Enclosure 2).

The **MEMORANDUM OF AGREEMENT AMONG THE U.S. ARMY CORPS OF ENGINEERS AND THE MARYLAND STATE HISTORIC PRESERVATION OFFICER AND CALVERT CLIFFS 3 NUCLEAR PROJECT, LLC (AS CONCURRING PARTY) PURSUANT TO 36 CFR 800 AND 33 CFR PART 325 APPENDIX C REGARDING THE CALVERT CLIFFS NUCLEAR POWER PLANT CALVERT COUNTY, MARYLAND** was developed to mitigate adverse effects to historic properties. In accordance with 36 CFR 800.6(b)(1)(iv), we are filing a copy of this MOA (Enclosure 3) with your office to conclude the Corps' requirements under Section 106 of the National Historic Preservation Act for this project. Further, any Department of the Army Section 10/404 permit that may be issued will include special conditions for implementation of this executed MOA.

Copies of the signed MOA are being provided to all of the signatories as well as Ms. Laura Quinn, Nuclear Regulatory Commission, and Ms. Cheryl Kerr, Maryland Department of the Environment. Please file the material enclosed and contact Mr. Woody Francis, of this office, at 410-962-5689 if you have any questions.

Sincerely,

Kathy Anderson

Kathy B. Anderson
Chief, Maryland Section Southern

Enclosures

Comments on Draft Environmental Impact Statement (DEIS) for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3 (NUREG-1936), dated April 2010

Prepared by Maryland DNR, Power Plant Research Program (PPRP)

General Comments:

- Although UniStar's plans and evaluations continue to evolve, the NRC team "froze" the UniStar application about the time of the State's original CPCN hearings (Maryland PSC Case No. 9127), and based its evaluation on the proposed facility configuration and planned equipment at that time. While this is understandable for the purposes of document production, it has resulted in NRC's project description being out of date in several areas. To avoid confusing interested parties who may be reviewing both the NRC and the State of Maryland documents, PPRP's comments below identify the major differences in project description.

- For the most part, the NRC DEIS appropriately references the State's Certificate of Public Convenience and Necessity (CPCN) conditions from Case No. 9127, and notes that UniStar's compliance with the State's air quality and water appropriations permits will minimize impacts to those resources. Any substantive inconsistencies between the CPCN conditions and the evaluation or conclusions in the NRC DEIS are discussed in the specific comments below. Case 9127 final conditions are available as Appendix II under Item #114 at www.psc.state.md.us (enter "9127" in the Case search box) or go directly to http://webapp.psc.state.md.us/Intranet/CaseNum/ submit.cfm?DirPath=C:\Casenum\9100-9199\9127\Item_114\&CaseN=9127\Item_1114. In addition, In November 2009, UniStar submitted an application to modify the Calvert Cliffs Unit 3 (CCU3) project that was licensed in Case 9127. In the application, being handled via Maryland Public Service Commission (PSC) Case 9218, UniStar is proposing minor changes to the design of previously approved sources and the addition of two types of new minor air emission sources. This request for a modification to the CCU3 CPCN affects only air quality; there were no proposed changes to the project that affect water, wastewater, terrestrial, noise, or socioeconomic resources or impacts. The State's Case 9218 proposed conditions are available as Item #28 www.psc.state.md.us (enter "9218" in the Case search box) or go directly to http://webapp.psc.state.md.us/Intranet/CaseNum/ submit.cfm?DirPath=C:\Casenum\9200-9299\9218\Item_28\&CaseN=9218\Item_28.

Specific Comments:

Document Reference	Comment
PROJECT DESCRIPTION	
Page 3-30	The project description indicates that a fifth, non-safety-related cooling tower would be constructed along with the four Essential Service Water System (ESWS) cooling towers. We understand that this is no longer part of UniStar's project design.
Page 3-30	The project description is inconsistent with DEIS Section 5.7, which describes the air quality impact analysis. Specifically, page 3-30 states that "Unit 3

1

	would have six standby diesel generators and two Station Blackout diesel generators," when actually there will be 4 emergency diesel generators and 2 station blackout diesel generators, for a total of 6 units (as described on page 5-46 of the DEIS).
Pages 5-46 and 5-47	The list of regulated air emission sources and emission rates does not reflect the current design as we understand it. PPRP's most current information regarding the relevant parameters is included as Attachment A to these comments. To avoid confusion on the part of individuals who may be reviewing both the NRC's and the State's evaluation, we would request that either (a) the final EIS be revised to reflect updated information, or (b) the final EIS include notations in appropriate parts of Sections 3, 4 and 5 to reflect the fact that some design parameters have changed.
Section 9.4	In the System Design Alternatives section of the DEIS, there is some confusion regarding the type of cooling system incorporated within the UniStar design. On page 9-161, the DEIS states that the proposed system is a mechanical draft cooling tower with plume abatement. However, UniStar's original cooling tower design study recommended a hybrid wet-dry mechanical cooling tower with plume abatement, and this is the description that the State used in its review documentation as part of the CPCN process. George Vanderheyden of UniStar confirmed the hybrid wet-dry design in his comments during the scoping process (see Appendix D of the DEIS, page D-39, lines 6 and 16). The NRC should clarify this point with UniStar and revise the relevant portions of Sections 3 and 9 appropriately.
TRANSPORTATION	
Section 4.4.4.1	We believe that the DEIS understates the potential impact of construction worker traffic on Calvert County. The Maryland State Highway Administration has not yet agreed to an acceptable Traffic Management Plan for mitigating impacts.
RECREATION	
Page 4-6	The DEIS concludes that construction and operation of Calvert Cliffs Unit 3 (CCU3) would have a small impact on recreational resources, including the Captain John Smith National Historic Trail. While PPRP does not necessarily disagree with the conclusion, it is difficult to determine the degree to which the trail would be affected in the absence of the National Park Service's (NPS) comprehensive management plan for the resource. This plan is currently under development and is scheduled to be released this year. During the State's CPCN evaluation process, NPS expressed concerns about proposed Unit 3 and we concluded that additional consultations between UniStar and NPS are necessary to ensure that the project's effects on the trail are understood and mitigated to the extent possible. This should be referenced in the DEIS as well.
FISCAL IMPACTS	
Page 5-35	There is a significant difference between the property tax revenue stream estimated by UniStar (and stated in the DEIS), and PPRP's estimate of the same. The property tax revenue stream stated in the DEIS amounts to $57.1 million in the first year of operation, declining over 15 years to $42.8 million. The property tax revenue stream is based on a capital cost of $5,000/kW, as estimated by UniStar in a response to a request for additional information (RAI), dated November 16, 2009. However, in the CPCN Case 9127 evaluation, PPRP estimated the total to be approximately $20 million in new tax revenues in the first year of operation. PPRP's estimate was based on a

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	Calvert County analysis of the proposed 50%, 15-year tax credit to Constellation Energy Group LLC (August 2006). This does not change the conclusion that CCU3 will result in a large positive benefit in property tax revenue to Calvert County. The NRC may want to note in the final EIS the fact that alternative methods of estimating future tax revenues may produce significantly different results, given the fact that detailed information on capital expenditures is not known, or is proprietary, at this time.

WATER SUPPLY	
Section 4.2.2, p. 4-9, line 7	The DEIS states that PPRP recommended that UniStar be granted an 8-year ground water appropriation to provide water for construction. This statement is outdated. The statement should be updated to indicate that the Maryland Public Service Commission (PSC) granted an 8-year appropriation to use ground water for construction as part of the issuance of the CPCN final order of June 26, 2009.
Table 4-10	The water-related impacts section of the table states that UniStar must "comply with COMAR 26.17.06 for dewatering activities or obtain Water Appropriation and Use Permit, as needed." This statement is not correct. The Water Appropriation and Use permit is subsumed within the CPCN issued by the Maryland PSC. Therefore, approval for dewatering was granted by the Maryland PSC when the CPCN was issued on June 26, 2009. The PSC license conditions pertaining to dewatering are Nos. 28 through 35.
Table 4-10	The water-related impacts section of the table includes the bullet "use offsite water supply." UniStar is only permitted to import fresh water to the site after it meets the requirements imposed by the Maryland PSC, with the exception of an emergency. Therefore, the statement should be revised to include "after the requirements set forth in Maryland CPCN Condition No. 38 have been met."
Section 5.2.2.2, p. 5-5, line 7	The statements regarding the proposed use of ground water from the Aquia aquifer as an alternative source upon unavailability of the desalination plant are not up to date. The CPCN issued by the Maryland PSC in Case 9127 required UniStar to conduct an alternatives analysis and submit the findings to MDE for consideration within one year (CPCN Condition No. 16). UniStar submitted a draft report describing the alternatives analysis to MDE and PPRP on June 2, 2010. MDE and PPRP are reviewing the report to determine whether the requirements set forth in Condition 16 have been adequately addressed.
Section 7.2.2, p. 7-11, line 4	The EIS did not reference specific well hydrographs in support of statements regarding changing potentiometric surface in the Aquia aquifer. The nearest Aquia well hydrograph (Well CA Fd 54), with continuous recording, is at Calvert Cliffs State Park. The following link provides the trend since 2004. http://waterdata.usgs.gov/md/nwis/dv?cb_72020=on&format=gif_default&begin_date=2003-06-21&end_date=2010-06-21&site_no=382407076260301&referred_module=sw. Additionally, a hydrograph for this well spanning the period 1978 to 2008 is shown on Figure 3-3 of PPRP's July 2008 Draft Environmental Review Document. The July 2008 ERD is available as part of Item #38 under Case 9127 or go to http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9100-9199\9127\Item_38\&CaseN=9127\Item_38.
Section 7.2.2, p. 7-11, lines 10-13	The DEIS states that MDE controls appropriations in excess of 10,000 gpd. The reference to a quantity should be removed in the context of the sentence that refers to the 80% management level. MDE regulates new ground water withdrawals unless an exemption has been granted. Exemptions are eligible

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	for uses up to 5,000 gpd, except for community water systems and if a use is in a water management strategy area.
CHESAPEAKE BAY CRITICAL AREA	
Page 2-34	The DEIS uses the scarlet tanager as a representative for Forest Interior Dwelling Species (FIDS) of birds, but does not indicate there are 24 other bird species designated as FIDS.
Page 2-34	The description of the first type of FIDS habitat should indicate forested tracts at least 50 acres in size rather than 20.2 acres.
Page 2-34	Although CAC 2000 does not state specifically that scarlet tanagers are declining in Maryland, the breeding bird atlas for Maryland does show a significant declining trend – see *Atlas of the Breeding Birds of Maryland and the District of Columbia* (1996) C. S. Robbins, Senior Editor. University of Pittsburgh Press.
Page 2-35	Figure 2-11 showing FIDS habitat in Calvert County, Maryland, should indicate the source of this data.
Page 2-164	Reference citation 2008d is redundant with 2008a.
Page 4-14	The sentence, "No area within CBCA limited development areas (LDAs) would be disturbed, and all temporary impacts would occur outside the CBCA," is misleading in that there are no LDAs designated in the project area. Within the Critical Area, the project would impact areas designated as Intensely Developed Area (IDA) and Resource Conservation Area (RCA).
Page 4-17	"There would be no disturbance in the LDA," is misleading in that there is no LDA designated in the project area.
Page 4-24	The statement, "Work activities within the CBCA are pending approval from the CBCA Commission, and mitigation may be warranted," should be updated to reflect that the Critical Area Commission has already granted approval of the project subject to a set of conditions. Critical Area Commission conditions are available as Item #80 under Case 9127 http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9100-9199\9127\Item_80\&CaseN=9127\Item_80.
Page 4-49	"To the extent practicable, design construction footprint to account for CBCA and other important habitat, including bald eagles nests," suggests that the project design has not concluded. The Critical Area Commission has reviewed what it considers to be the final project design. Any departure from this final project design that impacts the Critical Area would require further review by the Commission.
AIR QUALITY	
Page 5-70	In the summary of operational impacts, specifically Section 5.10.3 summarizing air impacts, the text implies that diesel generators are the only stationary source of emissions during operation. In fact, the CWS cooling tower is a significant source of air emissions.

RADIOLOGICAL IMPACTS	
Section 5.9	Since Federal radiation limits are stated in terms of radiation dose, UniStar focused on radiation dose when determining additional radiological impact. UniStar rightly uses the maximally exposed individual (MEI) as a "worst case scenario" when estimating impact. However, the lack of information on radiation concentrations that were used as a basis for dose projections precludes a "gut check" of radiological impact. The document should include an example calculation of dose using the inputs described for at least one of the computer models referenced.
Section 5.9	Inadvertent discharge of effluent to groundwater within the CCNPP property and its possible resulting migration out of the property to drinking water wells appears not to have been addressed. An analysis of groundwater migration patterns should be included in the Final EIS.
Page 5-64, line 9	Sentence should clarify that 1754 person-rem is the maximum dose at which zero excess health effects are probable. Also clarify whether 1754 person-rem is an annual value.
Section 5.9.6	Note that PPRP also conducts independent radiological monitoring of the environment around CCNPP and provides MEI dose estimates (e.g., Jones, T.S., B.H. Hood. 2010. Environmental Radionuclide Concentrations in the Vicinity of the Calvert Cliffs Nuclear Power Plant and the Peach Bottom Atomic Power Station: 2006-2007. PPRP-R-31. June 2010. Maryland Department of Natural Resources, Power Plant Research Program, Annapolis, MD.)
TERRESTRIAL AND AQUATIC ECOLOGY	
Pages 2-90, 5-28 and 9-136	Will potential future control of zebra mussels or any other reasonably predicted invasive or nuisance species require application of additional control chemicals that have not yet been identified or assessed?
Appendix K	Appendix K of the DEIS should be revised or supplemented for the FEIS with the latest version of the Conceptual Phase II Non-Tidal Wetland and Stream Mitigation Plan and any additional updates on the topic that come in before the due date of the Final EIS.
Page 4-39	We expect the UniStar-suggested measures for reducing potential dredging impacts to be fully evaluated and implemented where appropriate as part of the Joint Evaluation and Permit process. Failure to be resolved in the DEIS should not constrain in any manner the addressing of these items in the Joint Permit Process.
Pages 2-66, 5-11, F-44, 2-24, and 2-135	The proposed impact or disturbance to beach habitat for the project (and maintenance dredging) is very limited (see pages 2-66, 5-11 and F-44). However, the site does have beach habitat present to the south of the barge slip (2-24 and 2-135). We request that the environmental documentation include assessment of potential presence of horseshoe crabs, terrapins, and other significant tidal beach species (and/or those species reproducing on beach habitat). Measures or planning efforts for avoidance and minimization of impacts to beach habitats, if and as appropriate, should be assessed and described.

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THE NEED FOR POWER	
Section 8.0, Page 8-5; and Section 10.6, Page 10-21	The DEIS relies on a variety of sources to assess the need for power, including testimony from PSC Staff presented in PSC Case No. 9127 concerning the CPCN for Calvert Cliffs Unit 3. While the PSC is charged with addressing impacts to reliability and stability of the electric system in Maryland as part of a CPCN proceeding, it should be noted that any explicit cost/benefit assessment of the need for power and the cost of alternatives is no longer an integral part of the CPCN licensing scope. The statement on lines 10-11 of page 8-5 in the DEIS is no longer accurate: "As part of this licensing process, applicants must address a full range of environmental, engineering, socioeconomic, planning, and cost issues (MDNR PPRP 2007)." The aforementioned reference is not up to date, and we request that the citation be removed from the DEIS. An up-to-date description of the licensing scope and process is included in Chapter 1 of the PPRP document *Maryland Power Plants and the Environment* (CEIR-15), which is available here: http://esm.versar.com/pprp/ceir15/intro.htm. In addition, the Conclusions section on the Need for Power (page 10-21) states that the NRC relied upon PSC determinations (including the issuance of the CCU3 CPCN) as the basis for NRC's assessment that power is needed. Because the CPCN process does not rely on a "need for power" demonstration as a prerequisite for certification, the paragraph on page 10-21 should be revised. The NRC should also be aware that updated information from the PSC on supply and demand forecasts in Maryland is available in the recently released document *Ten-Year Plan (2009-2018) of Electric Companies in Maryland*, which is available here: http://webapp.psc.state.md.us/Intranet/Reports/2009-2018%20Ten%20Year%20Plan.pdf.

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ATTACHMENT A

Regulated emissions sources associated with the proposed Unit 3 project under the PSC Case No. 9127 and subsequent Case No. 9218 applications include:

- The CWS cooling tower with a maximum water circulation rate of 825,092 gpm.
- Four ESWS cooling towers, each with a maximum water circulation rate of 20,029 gpm.
- Four emergency diesel generators (EDG) rated at 10,130 kW(e).
- Two station blackout (SBO) generators rated at 5000 kW(e).
- Two fire water pumps (FWP) generators rated at 440 bhp.
- Two sponge media blast units.
- Maximum of 15 diesel fuel storage tanks.

The maximum water circulation rates for the CWS and ESWS cooling towers were revised and presented in the *Addendum to Modeling Analysis for the Proposed Unit 3 at Calvert Cliffs Nuclear Power Plant*, submitted by UniStar in August 2008 under Case No. 9127. The fire water pump generators, sponge media blast units and addition of up to nine diesel fuel storage tanks are new emission sources added in Case No. 9218.

PPRP and MDE reevaluated the annual emissions from the proposed Calvert Cliffs Unit 3 (CCU3) project since there were changes to the design water recirculation rates of the cooling towers and addition of new air emission sources. The annual emissions for the proposed CCU3 project are presented in the table below.

Annual Emissions for Proposed CCU3 Project
(tons per year)

	PM	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	SO_2
Sponge Media Blast Units	0.3	0.3	0.3				
Cooling Water System Cooling Tower	325.2	251.4	42.2				
Essential Service Water System Cooling Towers	32.7	31.8	5.9				
Diesel Fire Water Pumps	0.1	0.1	0.1	1.5	1.3	0.1	0.002
Diesel Generators	1.6	1.6	1.5	22.8	28.9	3.8	1.3
Storage Tanks						0.2	
Total	359.7	285.1	49.9	24.3	30.2	4.2	1.3

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, *Governor*
Anthony G. Brown, *Lt. Governor*
John R. Griffin, *Secretary*
Joseph P. Gill, *Deputy Secretary*

July 2, 2010

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop TWB-05-B01M
Washington, DC 20555-0001

Dear Sir or Madam:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the proposed Calvert Cliffs Nuclear Power Plant Unit 3. Our comments are attached. If you have any questions, please give me a call at 410-260-8661.

Sincerely,

Susan Tate Gray

Susan T. Gray
Manager, Nuclear Programs
Power Plant Assessment Division
Maryland Department of Natural Resources

Tawes State Office Building – 580 Taylor Avenue – Annapolis, Maryland 21401
410-260-8DNR or toll free in Maryland 877-620-8DNR – www.dnr.maryland.gov – TTY Users Call via the

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029
July 9, 2010

Ms. Laura M. Quinn, Environmental Project Manager
T-7D30
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Comments on the Draft Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3 – NUREG - 1936.

Dear Ms. Quinn:

In accordance with Section 102(2) (C) of the National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(2) (C); Section 309 of the Clean Air Act, 42 U.S.C. § 7609; and the Council on Environmental Quality (CEQ) regulations, 40 CFR Parts 1500-1508, the United States Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the above referenced project. The DEIS was prepared to assess the potential environmental impacts that would result from the construction and operation of an additional nuclear power unit (Unit 3) at the Calvert Cliffs Nuclear Power Plant facility.

UniStar (project sponsor) proposes to construct and operate an Areva U.S. EPR 4500MW(t) pressurized-water reactor at its Calvert Cliffs Power Plant facility located in Calvert Cliffs, Maryland. The proposed Unit 3 would use a closed-cycle, mechanical draft cooling towers, with makeup water supplied by the Chesapeake Bay.

EPA has developed a set of criteria for rating Draft Environmental Impact Statements. The rating system provides a basis upon which EPA makes recommendations to the lead agency. Based on this rating, EPA has rated the Calvert Cliffs Nuclear Power Plant Unit 3 DEIS as an Environmental Concerns 2 (EC-2). An EC rating means the review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. The numeric rating assesses the adequacy of the Environmental Impact Statement. The 2 rating indicates that the DEIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment. A copy of our rating system is attached, and can also be found at: http://www.epa.gov/Compliance/nepa/comments/ratings.html. The identified additional information, data, analysis, or discussion should be included in the final EIS. The basis for this rating is reflected in the attached comments. A summary of EPA's concerns include:

- Impacts to Historic and Cultural Resources
- Impacts to Freshwater and Related Aquatic Resources

- Cooling Water Intake and Discharge Impacts on the Chesapeake Bay Water and Aquatic Resources
- Environmental Justice Analysis
- Air Conformity Determination and the Limited Work Authorization Regulation
- Greenhouse Gas Emissions

EPA appreciates the NRC's efforts in early coordination with the development of the DEIS and looks forward to continued cooperation in the development of the final Environmental Impact Statement. If you have any questions regarding our concerns, please feel free to contact me or Kevin Magerr at (215) 814 5724

Sincerely,

Jeffrey Lapp, Associate Director
Office of Environmental Programs

cc: Kathy Anderson, USACOE
Woody Francis, USACOE

Attachments:

Comments on the Draft Environmental Impact Statement (EIS) for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3

General Comments

1. Section 2.3.1.1, Surface-Water Hydrology, Figure 2-8 is unclear in identifying the surface water hydrologic features on the Calvert Cliffs site (tributaries and other water resources are not delineated or clearly marked making it difficult to assess the impacts to the resource)
2. Section 4.3.1.1, Chesapeake Bay Critical Area (CBCA), it is reported that approximately 33.4 ac within the CBCA would be disturbed. It is unclear from Figure 4-2 where the proposed mitigation would take place.
3. Section 4.3.1.3 identifies the extent of impacts to non-tidal wetlands of the Calvert Cliffs site. Table 4-3 along with narrative text groups the wetlands into nine Wetland Assessment Areas. These nine Wetland Assessment Areas should be identified in Figure 4.3 to clarify the impacts to these areas.
4. The DEIS reports a natural oyster bar (NOB 19-2) just off shore of the Calvert Cliffs site. It also reported that dredging of the barge dock area and the trenching of the cooling water discharge pipe will have impact to this oyster bar area. Methods to avoid impact to the oyster bar should be included; if impacts are unavoidable, minimization of impacts are expected and appropriate compensatory mitigation should be proposed as required by 40 C.F.R 230.10(d); 230.93..
5. Recently the leakage or the discharge of tritium from nuclear power operations has raised concern at the NRC, however it appears the DEIS does not have any discussion on the potential sources, impact and protective measures to avoid or minimize leaks or discharges.
6. Figure 3-1 that depicts Calvert Cliffs' site, the layout and the aquatic resource are not clearly marked. References to certain facilities in the chapter are not indicated in the figure (Camp Conoy, independent spent storage instillation). No compass orientation is provided.
7. Figure 3.4 is unreadable to determine drainage areas. The figure does not include the stormwater management system.
8. Section 3.2.2.1 states the, "Pervious areas managed to reduce runoff and maintained free of vegetation would experience considerably higher recharge rates than adjacent areas with local vegetation." That statement could be true if the managed unvegetative areas are designed for infiltration and the soils are not compacted. In many cases these areas are compacted resulting in runoff rates similar to pavement. Further, vegetative areas provide a root system which assist in promoting greater infiltration.

Impacts to Historic and Cultural Resources

9. Section 4.1, Land-Use Impacts, the DEIS mentions that small portions of the currently proposed Captain John Smith Chesapeake National Historic Trail and the Star-Spangled Banner National Trail would be converted from recreational land use to industrial land use. The DEIS should explain what these historic trails are and how the land use

conversion would change their use (would this change disrupt trail activities?). It would also be helpful if this conversion could be quantified.

Freshwater and Related Aquatic Resources

10. Section 4.2.2 Water Use Impacts, the loss of groundwater recharge to the surficial aquifer could have significant impact on water quality and ecological function on the head waters tributaries and associated wetlands as well as to the base flow of John's Creek and related wetlands (it was reported that the base flow could drop as much as 50%). How are these impacts being minimized?
11. EPA agrees with the DEIS that the impacts to the aquatic resources due to the construction of Unit 3 and the 130 acre increase of impervious area can be classified as moderate. EPA believes the credited mitigation should include mitigation measures that are separate from measures that are required under other regulatory mechanisms.
12. While reported in the DEIS that the environmental impacts from Total Dissolved Solids (TDS) deposition from the cooling tower on vegetation would be negligible for both vegetation on site and in the vicinity, EPA recommends that a monitoring program be developed to monitor localized vegetation for the potential TDS stress. Further, EPA believes that deposition on impervious areas that drain to the headwater streams could cause higher TSD concentrated flows (both surface and shallow groundwater flow). EPA also recommends that those streams be monitored for TDS stress as well.

Cooling Water Intake and discharge impacts on the Chesapeake Bay Water and Aquatic Resources

13. The FEIS should include a discussion of mitigation measures for all water related construction activities (cooling water intake and discharge structures, fish return system, barge dock improvements and access channel, etc.) that minimize impacts to the aquatic resource. Those measures should include but not be limited to aquatic resource seasonal construction restrictions, the employment of noise or shock abatement systems, and turbidity abatement measures.
14. EPA does not agree with the DEIS statement that the Chesapeake Bay has generally high productivity (page 5-16, line 12). To the contrary, EPA and others have reported that the Chesapeake Bay continues to have poor water quality, degraded habitats and low populations of many species of fish and shellfish (EPA Bay Barometer EPA-903-R-09-001, March 2009). However, EPA does agree with the DEIS that the primary concerns for aquatic resources related to the water intake and consumption use are the amount of water drawn from the cooling water source, the Chesapeake Bay, and the potential for organisms to impinged on the intake screens, entrained in the cooling water system or entrapped within the common intake forebay. EPA has concerns with the mortality of the billions of aquatic organisms including fish fertilized eggs, larvae, juveniles, and adults associated with the existing, and now with additional impacts related to the proposed cooling system for unit 3. EPA believes that the overall aquatic mortality rate should be reduced. EPA suggest that a discussion of possible measures to reduce the overall mortality rate from Units 1, 2 and 3 be included in the DEIS. Possible considerations should include but not be limited to the design of a comprehensive closed loop cooling water system for Units 1, 2 and 3.
15. An increase in thermal discharge may also contribute to hypoxic zones or to the

exacerbation and spread of parasites like *Perkinsus marinus* within Oyster populations. There is some concern that the Abbe (1987) study may not be representative of current conditions in the waterbody due to ongoing development of the Chesapeake watershed

Environmental Justice Analysis

16. The Environmental Justice Methodology discussion starts on page 2-115. The second of the screening criteria states, "the percentage of the population of interest in the census block group is significantly greater (at least 20 percent) than the minority or low-income population percentage in the respective state." What is the scientific or statistical basis for the selection of the minority or low-income population percentage having to be at least 20 percent greater than the minority or low-income population of the respective state?
17. The Environmental Justice guideline stated in the DEIS may be interpreted two ways. It is not clear if the guideline calls for increasing the state minority or low-income population percentage by 20 percentage points, for example from 10% to 30% for benchmarking purposes, or if the intension is to increase the state minority or low-income population percentage by 20% from 10% to 12%, for example. The clarification of this benchmark is very important to the assessment. In fact, the first method, adding 20 percentage points to the state minority or low-income population percentage, has a disproportionately high impact on communities in states with low percentages of minority or low-income populations. Setting the benchmark at the state minority or low-income population percentage plus 20 percentage points would mean that a community in a state with a minority or low-income population percentage of 5% would have a benchmark of 25%, and increase of 400%. A community in a state with a minority or low-income population percentage of 10% would have a benchmark of 30%, an increase of 200%. On the other hand, increasing the state minority or low-income population by 20% would mean that a state with a minority or low-income population of 5% would have a benchmark of 6%, a 20% increase. A state with a 10 percent minority or low-income population would have a benchmark of 12%, a 20 % increase, and a state with a minority or low-income population of 30% would have a benchmark of 36%, a 20% increase. Which method is being used?
18. The health considerations cited on pages 2-116 and 2-117 seem vague and subjective. The health considerations include:
    - Are the radiological or other health effects significant or above the generally accepted norm?
    - Is the risk or rate of hazard significant and appreciably in excess of the general population?
    - Do the radiological or other health effects occur in groups affected by cumulative or multiple adverse exposures from environmental hazards?
    - Is there an impact on natural or physical environment that significantly and adversely affects a particular group?
    - Are there any significant adverse impacts on a group that appreciably exceed or [are] likely to appreciably exceed those on the general population?
    - Do the environmental effects occur in groups affected by cumulative or multiple adverse exposures from environmental hazards?

    For question One, what is meant by significant? Are there health indicators or health benchmarks that could be used to focus the investigation objectively? What is meant by norms in this case? Is this language referring to state or national averages for health outcomes associated with the concern? Question Two poses a similar problem. How do we determine what is appreciably in excess of the general population with respect to risk or rates of hazard? What are the benchmark values that are being used to conduct this evaluation? Since work on cumulative risk and cumulative impacts is limited, how can Question Three be fairly used as an assessment criterion? The state of study of cumulative impacts is such that Questions Three and Six can not be accurately answered. EPA believes additional thought needs to be put into the development of more clear and concise assessment criteria that are objective in nature, and that represent real opportunities to identify and assess at-risk populations.

19. The resolution of Figures 2-16 and 2-17 is too small to provide any meaningful information. It is difficult to see or identify the areas of concern, or to verify that the right areas have been identified.
20. Two public comments on Environmental Justice (as reported in the appendix) do not assure that the interests and concerns of minority and low-income populations were adequately represented. It seems that a number of groups participated in the outreach effort, but the information presented does not provide enough information to support the notion that the outreach was appropriate, adequate or that it reached significant numbers of people in the target communities. Grassroots Environmental Justice Organizations and organizations representing the interests of minority and low-income populations were not evident.
21. The review of subsistence and communities with unique characteristics seems inadequate. It is suggested that Dr. Vince Leggett of the Maryland Department of Natural Resources be contracted regarding this issue. It appears the assessment did not include any dialogue with the minority populations in the area, minority organizations related to such interests (there are such organizations), nor did the study use any data for groups of people in close proximity to the site. It seems unreasonable to conclude that no potential concern exists, when the appropriate data required to answer the question were not obtained. The subsistence fishing information gathered for minority communities at the edge of the study area should have been insightful, and lead to more focused study in the area of greatest concern.
22. Section 4.5.1, Health Impacts (and in other areas of the document), follows a train of thought that causes concern. It focuses on unique practices or characteristics that would lead to minority populations being impacted differently from the general population. That is an appropriate consideration. But it is *also* important to look also at where are the exposures occurring? What other risks or concerns are there that would put one segment of the population at elevated risk? Are there factors that need to be taken into consideration in this assessment that may provide information as to the potential for adverse impacts to occur in minority or low-income populations? Questions should focus on proximity to sources of exposure. Are there minority or low-income populations in close proximity to construction or other activities that may have adverse impacts or be sources of exposure? Are construction activities occurring in close proximity to minority or low-income populations? How will fugitive dusts be controlled? Who lives closes to these emissions? Is there the potential for adverse impacts upon drinking water sources in the area? If so, who lives near those sources? How will fishing be impacted by the project? What impact will the project have on those that are subsistence fishermen? These are the types of questions that EPA believes need to be asked.

23. No data are presented anywhere in this document that support statements stating that no adverse health, radiological, or non-radiological impacts are to be expected for minority and low-income populations as a result of the project. EPA recommends that supportive data and references be provided. [Where are the studies?]
24. Section 3.2.2.1 describes the intention of the stormwater management system to provide a safety function to keep locally intense precipitation from flooding safety related structures. It is unclear whether the stormwater management system is protective of water quality and the downstream channel, as well as whether it maintains stream ecological flows. EPA recommends that this be clarified in the FEIS.

Air Conformity Determination and the Limited Work Authorization Regulation

25. In Section 2.9.2 Air Quality the DEIS states that the NRC will comply with the requirements of the Clean Air Act (42 U.S.C. 7506) and air conformity regulation under 40 CFR 93.150 outside of the NEPA process. While such an approach is acceptable under the general conformity regulations, please be aware that the Limited Work Authorization Regulation (Final Rule 10/9/2007) does not preclude emissions from construction activities from inclusion in the air emissions inventory for determining applicability of conformity under 40 CFR 93.153, regardless of whether those emissions have a reasonable nexus to radiological health and safety and/or common defense and security.

Greenhouse Gases

26. In Section 7.6.2., Greenhouse Gas Emissions, the DEIS references a U.S. Global Change Research Program report evaluating the cumulative impacts of GHGs. Beyond mentioning the report, EPA recommends that the FEIS include a brief, qualitative summary of the potential impacts of climate change at global, national, and the relevant regional scale.
27. EPA also recommends that the discussion of mitigation in the FEIS analyze opportunities to reduce GHG emissions during construction and operation of the facility, e.g., through energy efficiency and/or use of renewable energy.
28. Finally, in Section 9.2.5., Summary Comparison of Energy Alternatives, NRC concludes that nuclear power results in significantly lower CO2 emissions than coal or natural gas-fired generation. EPA recommends that the discussion also state that lower CO2 emissions would result in lower climate change risks. See, e.g., CEQ's draft NEPA Guidance on Consideration of the Effects of Climate Change and GHGs (2/18/10) (GHG emission levels can serve as a reasonable proxy for climate change impacts).

RATING THE ENVIRONMENTAL IMPACT OF THE ACTION

- **LO (Lack of Objections)** The review has not identified any potential environmental impacts requiring substantive changes to the preferred alternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.
- **EC (Environmental Concerns)** The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.
- **EO (Environmental Objections)** The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental Objections can include situations:
    1. *Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;*
    2. *Where the Federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;*
    3. *Where there is a violation of an EPA policy declaration;*
    4. *Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or*
    5. *Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.*
- **EU (Environmentally Unsatisfactory)** The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposed action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:
    1. *The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;*
    2. *There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or*
    3. *The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.*

RATING THE ADEQUACY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)

- **1 (Adequate)** The draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.
- **2 (Insufficient Information)** The draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the proposal. The identified additional information, data, analyses, or discussion should be included in the final EIS.
- **3 (Inadequate)** The draft EIS does not adequately assess the potentially significant environmental impacts of the proposal, or the reviewer has identified new, reasonably available, alternatives, that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant

environmental impacts. The identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. This rating indicates EPA's belief that the draft EIS does not meet the purposes of NEPA and/or the Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 17 2010

Laura Quinn
Office of New Reactors
Mail Stop: T-7D30
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Ms. Quinn:

The National Marine Fisheries Service (NMFS) has reviewed Public Notice CENABOP-RMS 2007-08123, dated September 3, 2008; the draft Environmental Impact Statement (DEIS) and the essential fish habitat (EFH) assessment, all dated April 2010, for the Combined License for Calvert Cliffs Nuclear Power Plant, Unit 3.

NMFS, in general, does not object to the proposed new unit. Locating the proposed unit at the site of the existing Constellation Generation facility will consolidate impacts to fish resources. The proposed closed loop cooling system, lower intake volumes from the Bay, and use of intake design parameters that minimize fish entrainment and impingement will maintain fish mortality rates at levels significantly lower than those from the existing plant intake.

Our outstanding issues that remain relative to the proposed facility pertain to compensatory mitigation requirements for tidal and non-tidal impacts. We offer the following comments and recommendations on the mitigation issue.

ESSENTIAL FISH HABITAT: NEW DREDGING OF THE ACCESS CHANNEL TO THE RESTORED BARGE UNLOADING FACILITY

The proposed lengthening of the access channel to the barge unloading facility will directly affect the substrate of Natural Oyster Bar 19-2 (Flag Pond Oyster Bar). While oyster productivity on the Flag Pond Bar is currently low, surficial substrate within the proposed dredge area on the bar is comprised chiefly of sand, and is of oyster-producing quality.

Similar to other oyster bars in the mesohaline section of the Bay, the Flag Pond Bar supports benthic and pelagic communities important to local food webs. Sand substrate is preferred habitat for many benthic invertebrates, including mysid shrimp (*Mysis* spp.), sand shrimp (*Crangon* spp.); and, the commercially important soft clam (*Mya arenaria*). Sand bottom also provides unique and select foraging opportunities for bottom fish, and is preferred forage ground for many predatory species such as summer flounder (*Paralichthys* dentatus) and weakfish (*Cynoscion regalis*).

The proposed new dredging will permanently alter 4.5 acres of sandy bottom on the Flag Pond Oyster Bar. Deepening the dredge area to minus 16 feet, mean low water (MLW), may expose under-lying clay sediments, and will facilitate settling and accretion of fine-grain materials on the dredged channel bottom. Fine-grain substrate occurring adjacent to the previously dredged barge unloading facility likely reflects the habitat conditions that will exist in the newly dredged access channel.

Because the proposed dredging will permanently impact coarse-substrate benthic community, as well as forage habitat important to managed species such as summer flounder, NMFS recommends that compensatory mitigation be required for the 4.5 acres of dredging impact on Flag Pond Bar. The compensatory action should be in–kind; and, at a 2:1 replacement ratio. NMFS recommends pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation & Management Act that the Nuclear Regulatory Commission adopt the following EFH conservation recommendation.

Many oyster bars in the mesohaline section of the Chesapeake Bay have areas of substrate comprised of hard-pan clay and/or compacted mud. For example, one such area is Kent Narrows Bar in Queen Anne's County, where strong tidal currents maintain a surficial substrate of hard-pan clay. Opportunities exist in on these bars for enhancement of substrate with additions of sand and gravel.

1. With assistance from the Maryland Department of Natural Resources, Unistar should identify nine acres of public oyster bar within the mesohaline section of the mid-Chesapeake Bay with compacted clay/mud bottom. The selected nine acres of bottom may be distributed over one or three different public bars, and should be checked for firmness and ability to support additions of coarse material additions prior to material placement (e.g., through poling of the substrate). Selection of bars swept by strong bottom tidal currents is preferred, to avoid excessive siltation of the new substrate.

   The substrate of the identified nine-acres should be built-up or raised in elevation through placement of clean coarse sand, pea-gravel, small cobble from an upland source, to a thickness that will facilitate natural maintenance of the modified substrate (e.g., 24-36 inches).

2. The enhancement site(s) should be monitored by Unistar over a five-year period for resilience of the modified bottom as coarse substrate. Success of the enhancement action should be gauged by it producing at least 4.5 acres of stable coarse bottom substrate by the end of the five-year monitoring period. In the event of failure to meet the 4.5-acre threshold of success, requirement of Unistar to provide additional tidal compensatory mitigation at the end of the monitoring period will be at the discretion of the federal regulatory/resource agencies.

PROTECTION OF THE JOHNS CREEK NONTIDAL WATERSHED

With proposed displacement of headwater tributaries to Johns Creek, NMFS has been particularly concerned about adverse hydrologic impacts associated with this project throughout the Johns Creek watershed. Consequently, we are strong supporters of the proposed use of regenerative stormwater management (RSM), a process for transferring surface water flow off the impervious surface to the shallow ground water system which feeds downstream base flow. This process is widely practiced in Maryland and in other areas. The applicant is proposing to implement this process within upper Johns Creek and its headwater tributaries, to minimize typical watershed impacts associated with deforestation and increased impervious surface. NMFS requests that our Annapolis Habitat Field Office receive updates on installation of RSM systems associated with this project, as well as monitoring results (including photographic evidence) on the success of these systems in protecting and/or enhancing the hydrologic integrity of the Johns Creek watershed.

NONTIDAL WETLAND & STREAM COMPENSATORY MITIGATION
A significant portion of the proposed mitigation for nontidal wetland and stream impacts involves eradication of *Phragmites australis*. In consideration of the resistance of this species to control measures, the proposed control actions should be employed within designated areas in perpetuity, in order to better ensure success. Permanent common reed control measures that are the responsibility of the applicant should be required as special conditions in the authorized 404 permit for this project, with monitoring reports on success required up to 5-years following initiating of the enhancement action.

If you have any questions concerning this matter, you should contact John S. Nichols of our Annapolis, Maryland, Habitat Office; (410) 267-5675; or, John.Nichols@NOAA.GOV.

Sincerely,

Peter Colosi

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 20 2010

Kathy Anderson
Regulatory Branch, Maryland Permits - South
Baltimore District, Corps of Engineers
P.O. Box 1715
Baltimore, Maryland 21203-1715

Attn: Woody Francis

Dear Ms. Anderson:

The National Marine Fisheries Service (NMFS) has reviewed Public Notice CENABOP-RMS 2007-08123, dated September 3, 2008; and, the draft environmental impact statement (DEIS) and essential fish habitat (EFH) assessment, dated April, 2010, for the Combined License for Calvert Cliffs Nuclear Power Plant, Unit 3. We had not responded to the public notice until now as your office had agreed to postpone processing of the permit application until completion of the NEPA document. We offer the following comments and recommendations.

The Nuclear Regulatory Commission and the Baltimore District are acting as cooperating agencies for the review of this proposal, and are participating in a joint essential fish habitat (EFH) consultation as required under the Magnuson Stevens Fishery Conservation and Management Act. We understand that the Corps of Engineers has the authority to respond to recommendations we have provided that pertain to project construction activities, such as dredging, which will be authorized under the Clean Water Act and/or Rivers and Harbors Act. This response to your agency is specifically to address our EFH conservation recommendations and our Fish & Wildlife Coordination Act recommendations on this proposal.

NMFS, in general, does not object to the proposed new unit. Locating the proposed unit at the site of the existing Constellation Generation facility will consolidate impacts to fish resources. The proposed closed loop cooling system, lower intake volumes from the Bay, and use of intake design parameters that minimize fish entrainment and impingement will maintain fish mortality rates at levels significantly lower than those from the existing plant intake.

Our outstanding issues that remain, relative to the proposed facility, pertain to compensatory mitigation requirements for tidal and non-tidal impacts. We offer the following comments and recommendations on the mitigation issue.

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The proposed dredging will permanently impact coarse-substrate benthic community, as well as forage habitat important to managed species such as summer flounder. Therefore, NMFS recommends that compensatory mitigation be required for the 4.5 acres of dredging impact on Flag Pond Bar. The compensatory action should be in–kind; and, at a 2:1 replacement ratio. NMFS recommends pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation & Management Act that the Corps of Engineers adopt the following EFH conservation recommendation.

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FISH & WILDLIFE COORDINATION ACT RECOMMENDATIONS

PROTECTION OF THE JOHNS CREEK NONTIDAL WATERSHED

With proposed displacement of headwater tributaries to Johns Creek, NMFS has been particularly concerned about adverse hydrologic impacts associated with this project throughout the Johns Creek watershed. Consequently, we are strong supporters of the proposed use of Regenerative Stormwater Management (RSM) within upper Johns Creek and its headwater tributaries, a process for transferring surface water run-off from impervious surface to the shallow ground water system which feeds downstream base-flow. RMS has been practiced in other Maryland counties, particularly Anne Arundel County, to minimize typical watershed impacts associated with deforestation and increased impervious surface. NMFS requests that our Annapolis Habitat Field Office receive updates on installation of RSM systems associated with this project, as well as monitoring results (including photographic evidence) on the success of these systems in protecting and/or enhancing the hydrologic integrity of the Johns Creek watershed.

NONTIDAL WETLAND & STREAM COMPENSATORY MITIGATION

A significant portion of the proposed mitigation for nontidal wetland and stream impacts involves eradication of *Phragmites australis*. In consideration of the resistance of this species to control measures, the proposed control actions should be employed within designated areas in perpetuity, in order to better ensure success. Permanent common reed control measures that are the responsibility of the applicant should be required as special conditions in the authorized 404 permit for this project, with monitoring reports on success required up to 5-years following initiating of the enhancement action.

If you have any questions concerning this matter, you should contact John S. Nichols of our Annapolis, Maryland, Habitat Office; (410) 267-5675; or, John.Nichols@NOAA.GOV.

Sincerely,

Peter Colosi

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

MDP
Maryland Department of Planning
Maryland Historical Trust

Martin O'Malley
Governor
Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary
Matthew J. Power
Deputy Secretary

November 29, 2010

Woody Francis
Regulatory Branch
Baltimore District
U.S. Army Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203-1715

Re: Request for Cultural Resources Consultation Calvert Cliffs Unit 3, Nuclear Power Plant Site, Lusby (Calvert County), Maryland

Dear Mr. Francis:

In response to a request from UniStar Nuclear Energy, the Maryland Historical Trust (MHT) is reviewing modified and additional locations of certain structures and components related to the Calvert Cliffs Nuclear Power Plant Unit 3 (CC3) project to assess potential effects on historic properties in accordance with Section 106 of the National Historic Preservation Act and the Maryland Historical Trust Act, State Finance and Procurement Article §§ 5A-325 and 5A-326 of the Annotated Code of Maryland. We have reviewed the letter and enclosures submitted by Greg Gibson to the Maryland Historical Trust dated October 8, 2010. The above-mentioned structures and components include:

- Realigned CC3 Outfall Pipe and Sea Well
- CC3 Fish Return
- Restoration of Barge Unloading Facility (Maintenance and New Dredging)
- CC3 Water Intake Facility

Based on our review of the documents provided and *2009 Final Report, Submerged Cultural Resources Survey of a Proposed Outfall Pipe, Calvert Cliffs Nuclear Power Plant Unit 3 Construction, Calvert County, Maryland* prepared by Panamerican Consultants, Inc., no effects on cultural resources are expected as a result of proposed work associated with the Realigned CC3 Outfall Pipe and Sea Well, the CC3 Fish Return, or the CC3 Water Intake Facility provided that an unanticipated discoveries plan is implemented during all construction and dredging activities (see Stipulation V Unexpected Discovery of Historic Properties, *Memorandum of Agreement between the U.S. Army Corps of Engineers, the Maryland State Historic Preservation Officer and Calvert Cliffs 3 Nuclear Project, LLC, 2010*). However, new dredging related to the restoration of the Barge Unloading Facility will impact areas in the vicinity of unidentified high-amplitude magnetic anomalies (M03, M04, M05 and M06) recorded during the above-mentioned submerged cultural resources survey and a new area that has not been surveyed.

As a result, we recommend that a Phase I archeological survey (Identification) is conducted that both covers the area of the proposed Barge Unloading Facility that has not been surveyed and ascertains the sources of magnetic anomalies M03, M04, M05 and M06. These efforts should include electronic remote sensing and diving investigations and minimally result in the production of a technical report that follows the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). The consultant's team should include an underwater archeologist and the consultant

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Internet: www.marylandhistoricaltrust.net

Woody Francis
Request for Cultural Resources Consultation Calvert Cliffs Unit 3, Nuclear Power Plant Site, Lusby (Calvert County), Maryland
November 29, 2010
Page 2

should contact Dr. Susan Langley, Maryland State Underwater Archeologist, prior to the initiation of fieldwork to ensure that all work is performed in accordance with state standards and guidelines.

If you have questions or require further assistance, please contact me at tnowak@mdp.state.md.us or (410) 514-7668, or Dr. Susan Langley at slangley@mdp.state.md.us or (410) 514-7662. Thank you for providing us this opportunity to comment.

Sincerely,

Troy J. Nowak
Assistant State Underwater Archeologist
Maryland Historical Trust

cc: Greg Gibson (UniStar)
Dimitri Lutchenkov (Unistar)
Susan Langley (State Underwater Archeologist, MHT)
Yvonne F. Abernethy (Constellation Energy)
Laura Quinn (NRC)
Kristi Uunila (Calvert County)

MDP

Maryland Department of Planning
Maryland Historical Trust

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary

Matthew J. Power
Deputy Secretary

January 31, 2011

Woody Francis
Regulatory Branch
Baltimore District
U.S. Army Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203-1715

Re: Calvert Cliffs Nuclear Power Plant Unit 3 – Section 106 Mitigation
Field Recordation Archival Materials
Camp Conoy (CT-1312) and Baltimore & Drum Point Railroad (CT-1295)

Dear Mr. Francis:

The Maryland Historical Trust (MHT) has received additional materials related to the above-referenced undertaking. As the State Historic Preservation Office, MHT reviews all projects in Maryland that are undertaken, assisted, or permitted by a federal or state agency, and MHT comments on the proposed action pursuant to Section 106 of the National Historic Preservation Act and Sections 5A-325 and 5A-326 of the State Finance and Procurement Article.

The Calvert Cliffs Nuclear Power Plant Unit 3 project is the subject of a March 2010 memorandum of agreement (MOA). The MOA documents how the U.S. Army Corps of Engineers and the project sponsors will take historic properties into account and mitigate the adverse effects of the project on historic properties. Among the requirements of the MOA is "field recordation" of two historic properties, Camp Conoy and the Drum Point Railroad Bed, prior to any physical alteration of the historic properties.

On December 23, 2010 MHT received the field recordation, dated November 2010 and prepared by GAI Consultants on behalf of UniStar Nuclear Energy. We find that the materials meet the requirements of Stipulation II.A. of the MOA. The revised report "Documentation of The Baltimore and Drum Point Railroad Calvert County, Maryland (CT-1295)" does a good job placing the failed railroad effort in both its local and National context. The photographs and measured drawings appear to meet all relevant standards.

Thank you for providing us this opportunity to comment. We look forward to continuing to work with all interested parties as the stipulations of the MOA are fulfilled and the project proceeds. If you have questions or require assistance, please contact me at jsager@mdp.state.md.us or 410-514-7636.

Sincerely,

Jonathan Sager

Jonathan Sager
Preservation Officer
Maryland Historical Trust

JES \ 201005384
CC: Yvonne Abernethy (Constellation Energy)
Greg Gibson (UniStar)
Susan Gray (Power Plant Research Program)
Dimitri Lutchenkov (UniStar)
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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

February 23, 2011

Mr. Robert G. Schaaf, Chief
Environmental Projects Branch 3
Division of Site and Environmental Reviews
Office of New Reactors
Nuclear Regulatory Commission
Washington, D.C. 20555

RE: *Biological Assessment for the combined license application for Calvert Cliffs Nuclear Power Plant Unit 3*

Dear Mr. Schaaf:

The U.S. Fish and Wildlife Service has reviewed the referenced Biological Assessment dealing with effects of the proposed project on two federally-listed threatened species, the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) and the Puritan tiger beetle (*Cicindela puritana*). We have carefully evaluated the information provided in this document together with information in the project EIS and other information available to us. We concur that the construction and operation of the proposed project is not likely to adversely affect the northeastern tiger beetle or the Puritan tiger beetle.

We appreciate the opportunity to review this document. Should you have any questions regarding this response, please contact Andy Moser of my Endangered Species staff at (410) 573-4537.

Sincerely,

Leopoldo Miranda
Supervisor

cc: Kathy Anderson, Baltimore Corps of Engineers Regulatory Branch

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MDP

Maryland Department of Planning
Maryland Historical Trust

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary

Matthew J. Power
Deputy Secretary

March 10, 2011

Ms. Laura Quinn
Environmental Project Manager
U.S. Nuclear Regulatory Commission
Office of New Reactors, MS T7-E18
11545 Rockville Pike
Rockville, MD 20852

Re: MHT Review of Draft Environmental Impact Statement for Calvert Cliffs Nuclear Power Plant Unit 3 – Calvert County, Maryland

Dear Ms. Quinn:

Thank you for providing the Maryland Historical Trust (MHT) with a copy of the draft Environmental Impact Statement (DEIS) that has been produced by the Nuclear Regulatory Commission (NRC) for the above-referenced undertaking. As the State Historic Preservation Office, we have reviewed the document in accordance with Section 106 of the National Historic Preservation Act and §§ 5A-325 and 5A-326 of the State Finance and Procurement Article. Following our review of the DEIS, we concur with the findings presented in section 4.6 relating to the assessment of effects on historic properties.

As noted in the DEIS, a Memorandum of Agreement (MOA) has been executed between the U.S. Army Corps of Engineers, MHT, and Calvert Cliffs 3 Nuclear Project, LLC. The MOA stipulates the specific measures that will be taken to mitigate the project's adverse effects on the Baltimore & Drum Point Railroad, Camp Conoy, and archeological site 18CV474. If you have any questions regarding the MOA or our review of the DEIS, please do not hesitate to contact me at 410-514-7638 or dhenry@mdp.state.md.us. Thank you for providing us with this opportunity to comment.

Sincerely,

Dixie Henry

Dr. Dixie L. Henry
Preservation Officer
Maryland Historical Trust

DLH/201001993
cc: Woody Francis (COE)
Dimitri Lutchenkov (UniStar)

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

APR 15 2011

Robert G. Schaaf, Chief
Environmental Projects Branch 3
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Calvert Cliffs - Unit 3

Dear Mr. Schaaf,

This is in response to your letter regarding the proposed approval by the Nuclear Regulatory Commission (NRC) of an application submitted by Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (collectively referred to as UniStar) for a combined license (COL) for construction and operation of one new nuclear unit at its Calvert Cliffs Nuclear Power Plant (CCNPP) site near Lusby, Maryland. The US Army Corps of Engineers (ACOE) is proposing to approve the necessary permits to be issued under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The NRC and the ACOE have made the preliminary determination that the proposed action is not likely to adversely affect any species listed as threatened or endangered by NOAA's National Marine Fisheries Service (NMFS) and have requested NMFS concurrence with this determination.

A "not likely to adversely affect" determination can only be made when effects on listed species are expected to be beneficial; or adverse effects are expected to be discountable and/or insignificant. As explained in the joint U.S. Fish and Wildlife and NMFS Section 7 Handbook, "beneficial effects are contemporaneous positive effects without any adverse effects. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur."

The action to be authorized is the construction and eventual operation of Calvert Cliffs Unit 3, for a period of up to 40 years. NMFS has determined that all effects of the construction and operation of Unit 3 are insignificant and/or discountable; therefore, NMFS concurs with the determination made by ACOE and NRC that the proposed action is not likely to adversely affect any species listed by NMFS. Our analysis supporting this determination is provided below and is based on information provided in the Draft EIS dated April 2010, inclusive of the Biological Assessment (BA) listed as Appendix F, and other information provided by Harriet Nash of your staff through March 15, 2011, and other sources of the best available scientific information.

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Additionally, NMFS has reviewed the proposed action for impacts to species proposed for listing and provided technical assistance related to these species (loggerhead sea turtles and Atlantic sturgeon) at the end of this letter.

Description of the Facility and Proposed Action
As noted above, the NRC is reviewing an application for a COL to construct and operate a new nuclear reactor. Currently, there are two operating nuclear reactors on the Calvert Cliffs site, Units 1 and 2. The proposed new reactor, Unit 3, would be located adjacent to existing Units 1 and 2. The site is located along the Chesapeake Bay, approximately 60 miles south of Baltimore. The application under review does not involve Units 1 and 2 and there are no changes proposed to the operating licenses for these units. Unit 3 will be an AREVA NP, Inc. US EPR design pressurized water reactor steam electric system. Unit 3 would require a cooling water intake spate from Units 1 and 2. The proposed circulating water supply system (CWS) would be closed-cycle using a mechanical-draft cooling tower with plume abatement, drawing water and discharging a portion of it to Chesapeake Bay. The COL, if issued, would authorize the operation of Unit 3 for a period of 40 years.

For the proposed Unit 3, a 0.21 acre wedge-shaped pool would be build adjacent to the southern end of the existing forebay shared by Units 1 and 2. Water would enter the wedge-shaped pool from the Unit 1 and 2 forebay. Two safety-related 60-inch diameter intake pipes would extend from the wedge shaped pool 550 feet to a forebay. The ends of the pipes would be fitted with trash racks, consisting of metal bars with 3.5" spacing. The circulating water system (CWS) and safety-related ultimate heat sink (UHS) intake structures would have trash racks (bars 3.5" apart) and traveling screens, The traveling screens would be metallic or plastic mesh sized at 0.079 to 0.118 inch square (2-3mm). The CWS intake would have individual pump bays housing makeup pumps and a wash system to provide a spray to remove any biological material from the screens and transfer them to the fish-return system. The fish return outfall would consist of an 18-inch diameter pipe.

Construction of Unit 3 will involve the following: dredging and modification of the existing barge slip, including a sheet pile wall and a stone apron on the Chesapeake Bay shoreline; installation of the cooling water intake system including new sheet pile, armor removal, armor installation, and dredging; and, installation of the cooling water discharge system.

To construct the new Unit 3 intake, a sheet pile wall extending 180 linear feet from the existing shoreline to the existing baffle wall and extending approximately 90- feet channelward of the shoreline will be installed. Additionally approximately 75 linear feet of stone armor protection will be placed approximately 205 feet channelward of the sheet pile wall. An area surrounded by the sheet piling will be dredged to create an approximately 30-foot wide by 30-foot long by 25-foot deep area, resulting in the removal of approximately 900 cubic yards of sand and gravel to be disposed of at an upland location. After dredging, two 60-inch intake pipes with trash racks (3.5 inch spacing) at the pipe openings will be installed on the bottom. After the pipes are laid, approximately 80 linear feet of shoreline armor protection extending 10 feet channelward of the shoreline will be emplaced within the wedged-shaped area. After this work is completed, the temporary sheet pile wall around the 60-inch intake pipes will be removed, allowing the area to flood and submerge the pipes.

A 30-inch high density polyethylene (HDPE) discharge pipe with a three single port diffuser outfall structure approximately 550 linear feet channelward of the approximate MHW shoreline and depressed 4 feet below the bay bottom will be installed using mechanical dredging methods. The discharge point will be elevated 3 feet above the bay bottom. Additionally, a 20-foot by 40-foot riprap scour pad will be installed at the diffuser outfall permanently impacting 800 square feet (0.02 acres). The pipe will be installed with a minimum of 4 feet of cover to protect it from storms and snagging by small boat anchors. Turbidity curtains are anticipated to be used during the work to contain suspended sediments.

The existing barge slip will be restored and extended to re-establish use of an approximately 1,500-foot by 130-foot (average width), 195,000 square foot area to a bottom elevation of -16 feet mean low water, requiring approximately 50,000 cubic yards of mechanical dredging. All dredging will occur behind a turbidity curtain.

A new sheet pile wall will be installed along the shore line in front of the existing bulkhead. The bulkhead will consist of a new sheet pile wall driven immediately in front of the existing remaining bulkhead. This bulkhead will be approximately 90 feet in length starting from the barge slip extending south to an existing outfall culvert. Near shore maintenance dredging will require removal of silt/sediment which has mounded up over the past 30 years and will include restoration of an existing culvert outfall. The restoration activities in this area will include the emplacement of a 40-foot by 40-foot by 2-foot deep riprap apron extending approximately 40 feet channelward of the approximate MHW shoreline directly in front the existing outfall, allowing the discharge to flow directly in the bay as originally designed. The existing water depths range from approximately 0.00 feet to -16.0 mean low water within the proposed work area.

A fish return system will be provided as a part of the intake design. To construct the proposed fish return outfall, an 18-inch diameter HDPE pipe will be installed in a mechanically excavated trench. The pipe will be installed 4.0 feet below the bay bottom and will emerge from the bay bottom 40 feet channelward of the approximate MHW shoreline. The outfall location will be protected with a 10-foot by 10-foot riprap apron extending approximately 48 feet channelward of the approximate MHW shoreline. To install the pipe, approximately 40 linear feet of the existing shoreline revetment will be removed, and approximately 500 cubic yards of material will be dredged within the work area. The dredged material will be returned to the trench after the pipe is placed, and the existing shoreline revetment will be restored to its original design after pipe installation. All work will occur behind turbidity curtains.

NMFS Listed Species in the Action Area

The proposed project is located along the Chesapeake Bay, near Lusby, Maryland. The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50CFR§402.02). The majority of the work associated with this action will occur on land (e.g., site work for construction of the nuclear reactor); however, some work will occur in the Chesapeake Bay where NMFS listed species occur. The effects analysis presented below will be limited to work occurring in the Chesapeake Bay, where the action area overlaps with the occurrence of shortnose sturgeon and sea turtles, given that the rest of the construction and operations of the unit will have no effect on species listed under NMFS jurisdiction. For this action, the action area includes the area within the Chesapeake Bay where dredging, pile driving, and armoring will occur (i.e., the project footprint) as well as the underwater area where effects of pile installation and dredging (i.e., increase in suspended sediment, underwater noise) and the effects of discharges will be experienced.

Through March 2008, the incidental capture of 73 individual shortnose sturgeon in Maryland waters of the Chesapeake Bay had been reported via the Fish and Wildlife Service's Atlantic Sturgeon reward program. Two fish were recaptured within one to two weeks of their initial capture date (February 1999 in the mainstem of the Bay and then in the Sassafras River and May/June 2000 in the mainstem of the Bay). All of these fish were captured alive in either commercial or recreational fisheries. No directed studies targeting shortnose sturgeon have been conducted in the Chesapeake Bay outside of the Potomac River and nearly all of the data on shortnose sturgeon in the Chesapeake Bay system is a result of reporting incidental to the USFWS Atlantic sturgeon reward program. As such, the captures are dependent on the timing and distribution of fisheries gear which makes it difficult to use the data to draw conclusions regarding the distribution of the species in the Chesapeake Bay. As shortnose sturgeon use similar habitats throughout their range, it is possible to make some conclusions regarding the likelihood of shortnose sturgeon to occur in a particular location. Shortnose sturgeon early life stages (eggs and larvae) and juveniles are relatively intolerant to salinity and their distribution in the Chesapeake Bay and its tidal tributaries is likely limited to the freshwater reaches of rivers where shortnose sturgeon spawn. Based on the best available information (Kynard 2010), spawning in the Chesapeake Bay may be limited to the Potomac River. Shortnose sturgeon adults are typically found in the deepest areas (i.e., greater than 3 meters) with suitable dissolved oxygen (i.e., greater than 5 parts per million); often this type of habitat occurs in deepwater navigation channels. While foraging, shortnose sturgeon can also be found in shallower water over mudflats of shellfish beds. During the summer while seeking out thermal refugia, shortnose sturgeon are known to occur in deep holes. Overwintering is likely to occur only in rivers, and is not thought to occur in the mainstem Bay. Based on the best available information, including capture data reported through the FWS reward program, shortnose sturgeon adults are likely to be well distributed throughout the Maryland waters of the mainstem Chesapeake Bay wherever suitable habitat is present. However, as none of the habitat in the action area consists of deep channels, vegetated mudflats, or shellfish beds, shortnose sturgeon presence in the action area is likely to be sporadic and consist only of occasional transients. Shortnose sturgeon use of the action area is likely to be further limited by the low dissolved oxygen conditions which in the DEIS are described as well below the 5mg/l DO that is well tolerated by shortnose sturgeon.

Sea Turtles

Several species of sea turtles are known to be present in the Chesapeake Bay. Leatherback sea turtles (*Dermochelys coriacea*) are present off the Maryland coast but are predominantly pelagic. Loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), and green sea turtles (*Chelonia mydas*) are present in the Chesapeake Bay area mainly during late spring, summer and

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early fall when water temperatures are relatively warm. Sea turtles are expected to be present in the Chesapeake Bay between April and November. In Maryland waters of the Chesapeake Bay, sea turtles are most often documented in the waters below the Bay's confluence with the Potomac River; however, they also occur in the mid and upper Bay and could be present in the action area during the warmer months if suitable conditions for foraging were present; however, the nearshore location and relatively shallow depths (i.e., less than 16 feet) of the action area make the action area inconsistent with preferred sea turtle habitats (i.e., depths of 16-49 feet while foraging). Based on the best available information regarding the habitat present in the action area and the known occurrence of sea turtles in the Bay, individual sea turtles are only occasionally likely to be present in the action area.

Effects of the Action
Construction of Unit 3
As noted above, the majority of construction activities associated with the building of Unit 3 will take place on land. As species listed under NMFS jurisdiction are strictly aquatic while in the action area[1] , this consultation will focus on the effects of activities that either occur in the water or will affect conditions in the water where listed species occur. Three primary construction techniques will be used (dredging and pipeline trenching, pile driving, and rock armoring) and the analysis below is organized based on construction technique.

Dredging and Pipeline Trenching
Dredging of the bottom will be done using a shore-based or barge-mounted clamshell dredge to remove large rocks and soft sediment. As detailed above, dredging will be needed to re-establish the channel to the south side of the existing Units 1 and 2 barge dock and to create the trench for the cooling water discharge and the fish-return outfall pipelines. All dredging will occur behind turbidity curtains.

Most mobile organisms, including fish and sea turtles, are able to avoid mechanical dredge buckets. The slow movement of the dredge bucket through the water column and the relatively small area of bottom impacted by each dip of the bucket makes the likelihood of an interaction between a dredge bucket and an individual animal low. No interactions between mechanical dredges and sea turtles have ever been recorded, likely because sea turtles are able to avoid the slow moving dredge bucket. There are two reports of shortnose sturgeon being captured in dredge buckets, with one interaction being lethal (Dickerson 2006, ACOE 2009). However, hundreds of mechanical dredge operations occur each year in areas where shortnose sturgeon are known to occur and interactions are extremely rare. The likelihood of an interaction seems to be correlated to areas where there are large numbers of shortnose sturgeon present. Shortnose sturgeon may also be more vulnerable to interactions with a dredge while in a less alert state, such as when resting or while overwintering. Additionally, as both shortnose sturgeon captures occurred in the same location (Bath, Maine in the Kennebec River) at the same time of year, it is unknown if there is something unique about conditions at that site that make dredging interactions more likely.

1 Sea turtles nest on land; however, no sea turtle nesting activity occurs in the action area.

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As explained above, due to the lack of deep water habitat, vegetated mudflats, or shellfish beds in the action area, use of the area to be dredged by shortnose sturgeon is likely to be sporadic and limited to occasional transients. All dredging will take place behind a turbidity curtain which will prevent shortnose sturgeon from accessing the area where dredging will take place. Therefore, as sturgeon will be excluded from the area to be dredged, no interactions between the dredge equipment and shortnose sturgeon are likely to occur. Similarly, as sea turtles will also be excluded from the area to be dredged, there is no potential for sea turtles to interact with the dredge equipment.

Pile Driving

Pile driving would be used in three project areas, all involving the installation of sheet-pile walls. The installation process will use a vibratory hammer to install the sheet piling and a conventional pile driving hammer to install the 30 inch soldier piles to be placed at 10-foot intervals to support the sheet piling. In the BA, NRC estimates the noise levels for pile driving considering the method of pile driving, the types of materials and the water depth. The estimated cumulative sound exposure level (SEL2) values for driving the 30 inch steel piles is less than 183 dB. Driving of the steel sheet piles is expected to result in cumulative SEL values ranging from 160 dB to 165 dB. These levels are dependent not only on the pile and hammer characteristics, but also on the geometry and boundaries of the surrounding underwater and benthic environment. As the distance from the source increases, underwater sound levels produced by pile driving are known to dissipate rapidly. Using data from Illingworth and Rodkin, Inc. (2009) underwater noise levels produced from the driving of the 30-inch piles will attenuate approximately 5dB every 10- 20 meters and noise levels from the sheet piles will attenuate 3-5dB every 20 meters. This is based on a conservative literature estimate of attenuation rates for the driving of piles (Illingworth and Rodkin, Inc. 2007, 2009).

Pile driving affects fish through underwater noise and pressure which can cause effects to hearing and air containing organs, such as the swim bladder. Effects to fish can range from temporary avoidance of an area to death due to injury of internal organs. The type and size of pile, type of installation method (i.e., vibratory vs. hammer), type and size of fish (smaller fish are more often impacted), and distance from the sound source (i.e., sound dissipates over distance so noise levels are greater closer to the source) all contribute to the likelihood of effects to an individual fish. The available literature on effects of pile driving on aquatic species is difficult to summarize due to inconsistent methods of measuring underwater sound, the diversity of pile driving methods and receiving substrates, and the differing tolerances of aquatic species to underwater noise. Generally, however, the larger the pile and the closer a fish is to the pile, the greater the likelihood of effects.

Popper *et al.* (2006) have proposed a set of criteria for injury to fish exposed to pile driving. They propose that pile strikes which result in a sound exposure level (SEL) of driving. They propose that pile strikes which result in a sound exposure level (SEL) of 187 dB re 1 μPa as measured 10 meters from the source are expected to produce injuries to fish. These criteria are

2 Sound Exposure Level (SEL) is defined as that level which, lasting for one second, has the same acoustic energy as the transient and is expressed as dB re: 1$\mu Pa^2 \cdot$sec. SEL values are used in the assessment of underwater noise effects on species of fish

similar to those adopted by NMFS Northwest Regional Office, the US Fish and Wildlife Service, and the Federal Highway Administration, who determined that based on the best available scientific information, that pile driving resulting in an SEL level of 187 dB re: 1 μPa^2 •sec *and* a peak sound pressure level of 206 dB re: 1 μPa_{peak} in any single strike has no potential to cause injury or mortality to fish weighing more than 2 grams. All shortnose sturgeon likely to occur in the action area will weigh considerably more than 2 grams.

As different fish species demonstrate differing sensitivities to sound levels and there is little information on the effects of underwater noise on shortnose sturgeon, it is difficult to determine whether this criterion is appropriate for shortnose sturgeon. The NMFS Northwest Region criteria noted above, considered effects to green sturgeon which are biologically similar to shortnose sturgeon. Thus, it is reasonable to consider that acoustic thresholds designed to be protective of green sturgeon would also be protective of shortnose sturgeon.

While no studies have been conducted on the effects of pile driving on shortnose sturgeon, two studies have been conducted on the effects of blasting on this species. Both activities produce sound waves that would act similarly in the water column, making effects comparable. Moser (1999) studied the effects of rock blasting in Wilmington Harbor on caged hatchery reared shortnose sturgeon. A study done in the Cooper River, South Carolina, by Collins and Post (2001) tested the use of blasting caps to possibly repel shortnose sturgeon from a blasting site. These studies indicate that mortality of shortnose sturgeon only occurred when recorded sound levels were 234 dB. At sound levels between 196-229 dB, some shortnose sturgeon were temporarily stunned. These studies suggest that, consistent with the recommendations by Popper *et al.* 2006, exposure of shortnose sturgeon to sound levels below 187dB is unlikely to result in effects to this species. Sound levels resulting from the proposed action (183 dB SEL at the source for 30-inch piles and 160-165 dB SEL at the source for sheet piles) are below the range that could negatively affect shortnose sturgeon. Based on this information, NMFS is able to conclude that the effects of pile driving on shortnose sturgeon are insignificant and discountable.

The hearing capabilities of sea turtles are poorly known and there is little available information on the effects of noise on sea turtles. Some studies have demonstrated that sea turtles have fairly limited capacity to detect sound, although all results are based on a limited number of individuals and must be interpreted cautiously. Ridgway et al. (1969) found that one green turtle with a region of best sensitivity around 400 Hz had a hearing threshold of about 126 dB in water. Streeter (in press) found similar results in a captive green sea turtle, which demonstrated a hearing threshold of approximately 125 dB at 400 Hz, but better sensitivity at 200 Hz (110-115 dB threshold). McCauley *et al.* (2000) noted that dB levels of 166 dB re 1μPa were required before any behavioral reaction (e.g., increased swimming speed) was observed. Based on this and the best available information, any underwater noise below 166 dB is unlikely to cause any physiological or behavioral effects to sea turtles.

As noted above, sound levels may be as high as 183 dB_{SEL} at the source when installing 30-inch diameter piles. However, based on the attenuation rates, noise levels during the installation of the 30-inch piles will be lower than 166 dB at a distance beyond approximately 70 meters from the pile being driven. If a sea turtle was within 70 meters of the 30-inch pile being driven, this

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sea turtle is likely to exhibit avoidance behavior and leave the area where noise levels are greater than 166dB. As all pile driving will occur behind turbidity curtains, sea turtles will be excluded from the immediate area surrounding the pile driving; however, the area within the turbidity curtain will not contain the entire esonified area. However, as the area outside of the turbidity curtain where noise levels could be higher than 166 dB is extremely small (less than 50 meters), any avoidance behavior would not result in any disruption of essential behaviors such as foraging or migrating, which are expected to be able to be completed without a detectable delay. As such, any effect of exposure to sound associated with the installation of the 30-inch piles will be insignificant. Noise associated with the installation of the sheet piles (16-165 dB SEL) is below the level that would cause any effects to sea turtles. Based on the analysis presented here, the acoustic effects of pile driving on sea turtles are insignificant and discountable.

Water Quality Effects of Dredging and Pile Driving
Turbidity levels associated mechanical dredging activities produce sediment plumes typically ranging from 26.0-350.0 mg/L (ACOE 2007, Anchor Environmental 2003). Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580.0 mg/L to 700,000.0 mg/L depending on species. Sublethal effects have been observed at substantially lower turbidity levels. For example, prey consumption was significantly lower for striped bass larvae tested at concentrations of 200 and 500 mg/L compared to larvae exposed to 0.0 and 75.0 mg/L (Breitburg 1988 in Burton 1993). Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954.0 to 1,920.0 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 in Burton 1993). While there have been no directed studies on the effects of TSS on shortnose sturgeon, shortnose sturgeon juveniles and adults are often documented in turbid water and Dadswell (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. As such, shortnose sturgeon are assumed to be as least as tolerant to suspended sediment as other estuarine fish such as striped bass.

The TSS levels expected to result from mechanical dredging (26.0-350.0 mg/L) are below those shown to have an adverse effect on fish (580.0 mg/L for the most sensitive species, with 1,000.0 mg/L more typical; see summary of scientific literature in Burton 1993) and benthic communities (390.0 mg/L (EPA 1986)). The installation/removal of piles within the action area will disturb shoreline sediments and may cause a temporary increase in suspended sediment in the nearshore area. However, little increase in sedimentation or turbidity is expected to result from these construction activities due to the use of a turbidity curtain. If any sediment plume does occur, it is expected to be small and suspended sediment is expected to settle out of the water column within a few hours and any increase in turbidity will be short term. Turbidity levels associated with pile installation/removal are expected to be only slightly elevated above background levels (average range of 10.0 – 120.0 mg/L) (ACOE 2007, Anchor Environmental 2003).

TSS is most likely to affect sea turtles if a plume causes a barrier to normal behaviors or if sediment settles on the bottom affecting sea turtle prey. As any turbidity plume will be contained within the turbidity curtain, no sea turtles or shortnose sturgeon are likely to be exposed to increased turbidity. As such, any effects to sea turtles resulting from increased turbidity associated with pile driving or dredging will be insignificant and discountable.

Armoring

The benthic substrate near key underwater structures in the project area would be armored by depositing rocks. The largest area to receive rock armor is the area next to the new sheet-pile wall to be installed to create the intake area for Unit 3 (0.11acres). Four overlying layers of rock would be added, ranging from washed gravel on the bottom to large quarry rock (average weight per rock of 2 tons). Smaller areas of armor would also be placed at the end of the fish-return system, the cooling water discharge diffuser, and the nearshore area of the barge dock. An area of less than 0.5 acres would be armored, in total.

As explained above, an area of less than 0.5 acres will be armored with large rocks. Due to the small size of the area, the loss of this benthic habitat is not likely to result in the loss of foraging opportunities or cause any change in essential behaviors. As such, effects to shortnose sturgeon and sea turtles from the loss of benthic habitat associated with the placement of rocks at these nearshore areas will be insignificant.

Operation of the Facility

As noted above, the proposed COL would authorize the operation of Unit 3 for a period of 40 years. The operation of the facility could affect listed species by causing impingement or entrainment of these species or their prey and by affecting water quality. The following analysis considers the effects of the operation of the facility on listed species.

Impingement and Entrainment

The impingement of sea turtles and shortnose sturgeon has been documented at some nuclear power plants on the East Coast. However, at Calvert Cliffs Unit 3 the approach velocities of the intake structures and intake screens are such that shortnose sturgeon and sea turtles are able to readily avoid becoming impinged on the structures. As reported in the BA and DEIS, under the worst case scenario, through-screen flow velocity and intake approach velocities within the forebay would be less than 0.5 feet per second. Shortnose sturgeon adults are able to readily avoid intakes with approach velocities of less than 3.5 feet per second and even the less mobile life stages such as larvae, are able to avoid approach velocities of 0.5 feet per second. As such, any shortnose sturgeon in the vicinity of the intakes are expected to be able to readily swim away from the screens or pipes and avoid impingement. Sea turtles are known to be strong swimmers and are also expected to be able to readily swim away from the screens or pipes and avoid impingement. Spacing between the trash bars is 3.5 inches, while screening is 2-3 mm mesh. Due to the small size of the intakes and screening, the individuals of these species that are likely to be present in the action area are too large to be vulnerable to entrainment. Based on this analysis, the impingement or entrainment of any shortnose sturgeon or sea turtles is extremely unlikely to occur. This conclusion is supported by past monitoring data. NRC has reviewed the impingement and entrainment monitoring data collected for Units 1 and 2, which has occurred since 1975. No shortnose sturgeon have been reported. The only record of a sea turtle at the facility was the collection of 1 previously dead sea turtle (unknown species) in 2001. The volume of water taken in by Units 1 and 2 is significantly larger than Unit 3 (Unit 3 will intake approximately 1.82% of the amount of water taken in by Units 1 and 2) and the intake velocity at these units is higher. Thus, the likelihood of impingement of a sea turtle at Units 1 and 2 would reasonably be expected to be higher than at Unit 3, where intake velocities will be lower and the volume of water removed is significantly smaller. As the level of impingement at Units 1 and 2 is extremely low (1 sea turtle in 35 years) and it is reasonable to expect that the impingement of sea turtles at Unit 3 would be even lower, it is reasonable to conclude that the impingement of a sea turtle at Unit 3 is extremely unlikely to occur.

Impingement and Entrainment - Effects on Prey
Despite the low intake velocities, some aquatic organisms are likely to be impinged or entrained at the Unit 3 intake. Shortnose sturgeon feed on benthic invertebrates. As these species are immobile and do not occur in the upper water column where they could be vulnerable to impingement or entrainment, no potential shortnose sturgeon forage items are likely to be affected by water withdrawal. As such, the effects of water withdrawal on shortnose sturgeon forage is discountable.

Green turtles are herbivorous, feeding primarily on seagrasses while in the Chesapeake Bay. As sea grasses are immobile and rooted in the substrate, sea grasses are not likely to be subject to impingement or entrainment in the cooling water system. As such, effects of water withdrawal on green sea turtle forage will be discountable.

Loggerhead turtles feed on benthic invertebrates such as gastropods, mollusks and crustaceans. Kemp's ridleys are largely cancrivirous (crab eating), with a preference for portunid crabs including blue crabs. Leatherback sea turtles feed exclusively on jellyfish. The DEIS provides information on the likely mortality of aquatic life associated with the cooling water intake at Unit 3. While the DEIS does not provide an estimate of the number of jellyfish likely to be killed as a result of impingement or entrainment at Unit 3, the DEIS includes a calculation of the average annual estimated mortality of fish in at Unit 3 of approximately 6,000 fish/year. NRC reports that the estimated mortality values are extremely low compared to Bay populations of these species. Given that the numbers of fish killed as a result of impingement at Unit 3 is extremely small compared to the population numbers for these species, it is likely that any mortality resulting from Unit 3 is undetectable at a population level. For example, bay anchovy are the most commonly impinged species; however, there are approximately 11.2 billion individual bay anchovies in the Chesapeake Bay each year, making the death of even 6,000 individuals an extremely small percentage of the population (less than 0.000001%).

Blue crabs are a significant prey species for loggerhead and Kemp's ridley sea turtles in the Chesapeake Bay. NRC has estimated the number of blue crab mortalities resulting from impingement or entrainment at the intake to be approximately 62 blue crabs a year. NRC reports that the 2007 commercial blue crab catch, which represents only a portion of the available blue crabs in the Chesapeake Bay, was approximately 22 million individuals. The mortality of 62 blue crabs per year represents an extremely small percentage of the available blue crabs in the Bay.

While the operation of Unit 3 is likely to result in the loss of some potential forage items for sea turtles (fish, jellyfish and crabs), this loss is likely to be undetectable compared to the availability of prey in the action area and in the Chesapeake Bay as a whole. Based on the best available information outlined above, while the operation of Unit 3 may result in a reduction of forage items available for loggerhead, Kemp's ridley and leatherback sea turtles in the action area, this loss is likely to insignificant and discountable.

Discharge of heated effluent

The effluent discharge from Unit 3 would be directly into Chesapeake Bay. Using a CORMIX[3] model, the applicant determined that the thermal discharge from Unit 3 would be small and that waste heat would dissipate quickly because of the small size of the thermal plume. As reported in the DEIS, NRC staff conducted an independent evaluation with the CORMIX model and the maximum discharge volume proposed by UniStar and confirmed this determination. Using the model, the area of bottom touched by waters 2°C above ambient will be limited to about 6 acres. As the thermal plume is limited to the nearshore area, shortnose sturgeon and sea turtles are expected to be able to avoid the plume by swimming around it. Due to the small area affected by the thermal discharge, any avoidance will not result in any disruption or delay in any essential behaviors that these species may be carrying out in the action area, including foraging, migrating or resting.

Based on the limited size of the thermal plume, the rapid dispersion of heat and the ability for sea turtles and shortnose sturgeon to avoid the area of heated water, any effects of the discharge of heated effluent on these species is likely to be insignificant.

Pollutants Discharged from the Facility

Chemicals, such as anti-scaling compounds, corrosion inhibitors and biocides, would be added to the cooling water system and the essential water system. Biofouling in the CWS would be controlled by the limited application of chlorine or bromine. NRC has compared the estimated concentrations of the constituents of the waste stream to the Maryland State aquatic life criteria and found that the expected levels are well below the aquatic life criteria. NRC also reports that bioassay testing completed for effluent from Units 1 and 2, which is chemically similar to effluent expected from Unit 3, has not indicated any toxicity to test organisms.

Water quality criteria are developed by EPA for protection of aquatic life. Both acute (short term exposure) and chronic (long term exposure) water quality criteria are developed by EPA based on toxicity data for plants and animals. Often, both saltwater and freshwater criteria are developed, based on the suite of species likely to occur in the freshwater or saltwater environment. For aquatic life, the national recommended toxics criteria are derived using a methodology published in *Guidelines for Deriving Numeric National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*. Under these guidelines, criteria are developed from data quantifying the sensitivity of species to toxic compounds in controlled chronic and acute toxicity studies. The final recommended criteria are based on multiple species and toxicity tests. The groups of organisms are selected so that the diversity and sensitivities of a

3 CORMIX is a water quality modeling system designed to predict plume geometry and dilution resulting from wastewater discharge from point sources.

broad range of aquatic life are represented in the criteria values. To develop a valid criterion, toxicity data must be available for at least one species in each of eight families of aquatic organisms. The eight taxa required are as follows: (1) salmonid (e.g., trout, salmon); (2) a fish other than a salmonid (e.g., bass, fathead minnow); (3) chordata (e.g., salamander, frog); (4) planktonic crustacean (e.g., daphnia); (5) benthic crustacean (e.g., crayfish); (6) insect (e.g., stonefly, mayfly); (7) rotifer, annelid (worm), or mollusk (e.g., mussel, snail); and, (8) a second insect or mollusk not already represented. Where toxicity data are available for multiple life stages of the same species (e.g., eggs, juveniles, and adults), the procedure requires that the data from the most sensitive life stage be used for that species.

The result is the calculation of acute (criteria maximum concentration (CMC)) and chronic (criterion continuous concentration (CCC)) criteria. CMC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly (i.e., for no more than one hour) without resulting in an unacceptable effect. The CCC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. EPA defines "unacceptable acute effects" as effects that are lethal or immobilize an organism during short term exposure to a pollutant and defines "unacceptable chronic effects" as effects that will impair growth, survival, and reproduction of an organism following long term exposure to a pollutant. The CCC and CMC levels are designed to ensure that aquatic species exposed to pollutants in compliance with these levels will not experience any impairment of growth, survival or reproduction.

Data on toxicity as it relates to sea turtles and shortnose sturgeon is extremely limited. In the absence of species specific chronic and acute toxicity data, the EPA aquatic life criteria represent the best available scientific information. Absent species specific data, NMFS believes it is reasonable to consider that the CMC and CCC criteria are applicable to NMFS listed species as these criteria are derived from data using the most sensitive species and life stages for which information is available. As explained above, a suite of species is utilized to develop criteria and these species are intended to be representative of the entire ecosystem, including marine mammals and sea turtles and their prey. These criteria are designed to not only prevent mortality but to prevent all "unacceptable effects", which, as noted above, is defined by EPA to include not only lethal effects but also effects that impair growth, survival and reproduction.

For the Calvert Cliffs facility, the relevant water quality criteria are the Maryland water quality criteria, which must be certified by EPA every three years and are the criteria against which NRC compared the expected levels of pollutants in the effluent. This certification process is designed to ensure that the MD water quality standards are consistent with, or more protective than, the EPA national recommended aquatic life criteria. Based on this reasoning outlined above, for the purposes of this consultation, NMFS considers that pollutants that are discharged with no reasonable potential to cause excursions in water quality standards, will not cause effects that impair growth, survival and reproduction of listed species. Therefore, the effect of the discharge of these pollutants at levels that are less that the relevant water quality standards, which by design are consistent with, or more stringent than, EPA's aquatic life criteria, will be insignificant on NMFS listed species.

ESA Section 7 Conclusions
Based on the analysis that all effects to shortnose sturgeon will be insignificant or discountable, NMFS is able to concur with the determination that the proposed approval of the COL by NRC and the issuance of necessary permits by the ACOE is not likely to adversely affect any listed species under NMFS jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required. Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) If a new species is listed or critical habitat designated that may be affected by the identified action. Should you have any questions about this correspondence please contact Julie Crocker at (978) 282-8480 or by e-mail (Julie.Crocker@Noaa.gov).

Technical Assistance for Proposed Species
Once a species is proposed for listing, the conference provisions of the ESA apply. As stated at 50 CFR 402.10, "Federal agencies are required to confer with NMFS on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. The conference is designed to assist the Federal agency and any applicant in identifying and resolving potential conflicts at an early stage in the planning process."

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)* are known to occur in the Chesapeake Bay. On October 6, 2010, NMFS published two rules proposing to list four distinct population segments (DPS) of Atlantic sturgeon as endangered (i.e., New York Bight, Chesapeake Bay, Carolina, and South Atlantic) and one DPS as threatened (Gulf of Maine DPS) under the ESA (75 FR 61872; 75 FR 61904). Atlantic sturgeon are well distributed throughout the mainstem Chesapeake Bay and sturgeon from any of the 5 DPSs could be present in the action area.

Under the provisions of 50 CFR §402.10, federal agencies shall confer with NMFS on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. If present in the action area, Atlantic sturgeon would be exposed to effects of the proposed action. However, as none of the habitat in the action area consists of deep channels, vegetated mudflats, or shellfish beds, Atlantic sturgeon presence in the action area is likely to be sporadic and consist only of occasional transients. Atlantic sturgeon use of the action area is likely to be further limited by the low dissolved oxygen conditions which in the DEIS are described as well below the 5mg/l DO that is well tolerated by Atlantic sturgeon. If present in the action area during construction, NMFS anticipates that effects to Atlantic sturgeon would be similar to those described for shortnose sturgeon above. As such, all effects resulting from dredging, pile driving and other in-water construction are expected to be insignificant and discountable.

NMFS has considered the effects of the operation of Unit 3 on Atlantic sturgeon. Like shortnose sturgeon, potential impacts to Atlantic sturgeon are likely limited to impingement or entrainment at the CWS intakes or exposure to pollutants associated with the discharge of effluent (chemicals or heat). Atlantic sturgeon are expected to demonstrate similar swimming abilities as shortnose sturgeon. Thus, they are likely to be able to actively avoid the screens and intakes with intake velocities of no more than 0.5 fps. As reported in the DEIS, no impingement or entrainment of Atlantic sturgeon has been reported at Units 1 or 2. Similar to the analysis for shortnose sturgeon presented above, all effects of the discharges are expected to be insignificant. As all effects of the construction and operation of Unit 3 are likely to be insignificant and discountable and the proposed action is not likely to result in the injury or mortality of any Atlantic sturgeon, the action is not likely to appreciably reduce the survival and recovery of any DPS of Atlantic sturgeon and therefore it is not reasonable to anticipate that this action would be likely to jeopardize the continued existence of any DPS of Atlantic sturgeon. As such, no conference is necessary for Atlantic sturgeon. Should project plans change, NMFS recommends that the NRC and/or the ACOE discuss the potential need for conference with NMFS.

On March 16, 2010, NMFS published a proposed rule to list two distinct population segments (DPS) of loggerhead sea turtles as threatened and seven distinct population segments of loggerhead sea turtles as endangered, including the Northwest Atlantic DPS. This rule, when finalized, would replace the existing listing for loggerhead sea turtles. Currently, the species is listed as threatened range-wide. In the analysis above, NMFS has considered effects to the current global listing of loggerhead sea turtles. Sea turtles in the action area are likely to be from the Northwest Atlantic DPS. As explained above, all effects to loggerhead sea turtles will be insignificant and discountable and the proposed action is not likely to result in the injury or mortality of any loggerhead sea turtles; as this determination was based on the potential effects to individuals, the change in status for these sea turtles (i.e., from threatened to endangered) would not change these determinations. As all effects of the construction and operation of Unit 3 are likely to be insignificant and discountable and the proposed action is not likely to result in the injury or mortality of any loggerhead sea turtles, the action is not likely to appreciably reduce the survival and recovery of any DPS of loggerhead sea turtles, including the Northwest Atlantic DPS and therefore it is not reasonable to anticipate that this action would be likely to jeopardize the continued existence of any DPS of loggerhead sea turtles. As such, no conference is necessary for loggerhead sea turtles. Should project plans change, NMFS recommends that the NRC and/or the ACOE discuss the potential need for conference with NMFS.

Should you have any questions regarding the conclusions reached above as they relate to the need for conference or the need for future consultation should these listings be finalized, please contact Julie Crocker of my staff at the number noted above.

Sincerely,

Patricia A. Kurkul
Regional Administrator

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Cc: Nash, NRC
Crocker, Damon-Randall, F/NER3
Nichols, F/NER4

File code: Sec. 7 NRC Calvert Cliffs COL Unit 3
PCTS: I/NER/2010/

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Biological Assessment

National Marine Fisheries Service

Calvert Cliffs Nuclear Power Plant Unit 3
Calvert County, Maryland

U.S. Nuclear Regulatory Commission Combined License Application
Docket No. 52-016

U. S. Army Corps of Engineers Permit Application
Permit Application No. NAB-2007-08123-M05 (Calvert Cliffs 3 Nuclear Project, LLC/UniStar Nuclear Operating Services, LLC)

April 2010

U.S. Nuclear Regulatory Commission
Rockville, Maryland

U.S. Army Corps of Engineers
Baltimore District

1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (UniStar or applicant) for a combined license (COL) to construct and operate a new nuclear reactor with a design-rated gross electrical output of 1710 megawatts-electric (MW(e)) on the Calvert Cliffs site. The U.S. Army Corps of Engineers (USACE or Corps) is reviewing an application from UniStar for a Department of the Army (DA) Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (Rivers and Harbors Act) and Section 404 of the Clean Water Act (33 U.S.C. 1344) to perform site preparation and construction activities for the proposed new unit at the Calvert Cliffs site. Currently, there are two operating nuclear reactors on the Calvert Cliffs site, Units 1 and 2. The proposed new reactor – Unit 3 – would be located adjacent to existing Units 1 and 2. The site is located about 60 mi south of Baltimore; 40 mi southeast of Washington, D.C.; 10.5 mi southeast of Prince Frederick, Maryland; and 7.5 mi north of Solomons, Maryland (Figure 1).

Pursuant to National Environmental Policy Act of 1969, as amended (NEPA), the NRC and the Corps are cooperating agencies with the NRC being the lead agency, and they are preparing an environmental impact statement (EIS) as part of the agencies' review of the COL and DA permit applications. The Corps is cooperating with the NRC to ensure the information presented in the EIS is adequate to fulfill the requirements of Corps regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the substantive environmental criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the United States; and the Corps public interest review process. As required by Title 10 of the Code of Federal Regulations (CFR) Part 51.26, the NRC has published in the *Federal Register* a Notice of Intent (73 FR 8719) to prepare an EIS and to conduct scoping. The final EIS will be issued after considering public comments on the draft EIS. The impact analysis in the EIS includes an assessment of the potential environmental impacts of the construction and operation of a new nuclear power unit at the Calvert Cliffs site and along the associated transmission line corridors, including potential impacts to the threatened and endangered species. If issued, the COL would authorize UniStar to construct and operate the new unit. The Corps will finalize its Record of Decision after issuance of the final EIS.

The Corps and the NRC are conducting a joint consultation with the National Marine Fisheries Service (NMFS) pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended (ESA) and have prepared this biological assessment (BA), which examines the potential impacts of construction and operation of the proposed Unit 3 at the Calvert Cliffs site on threatened or endangered species. This BA examines the potential impacts of the proposed actions on Federally listed species within the NMFS's jurisdiction. The BA focuses on five species, the shortnose sturgeon (*Acipenser brevirostrum*), the loggerhead turtle (*Caretta caretta*), the Kemp's ridley turtle (*Lepidochelys kempii*), the green turtle (*Chelonia mydas*), and the leatherback turtle (*Dermochelys coriacea*), that occur near the Calvert Cliffs site (Table 1). There are no areas designated as critical habitat near the Calvert Cliffs site.

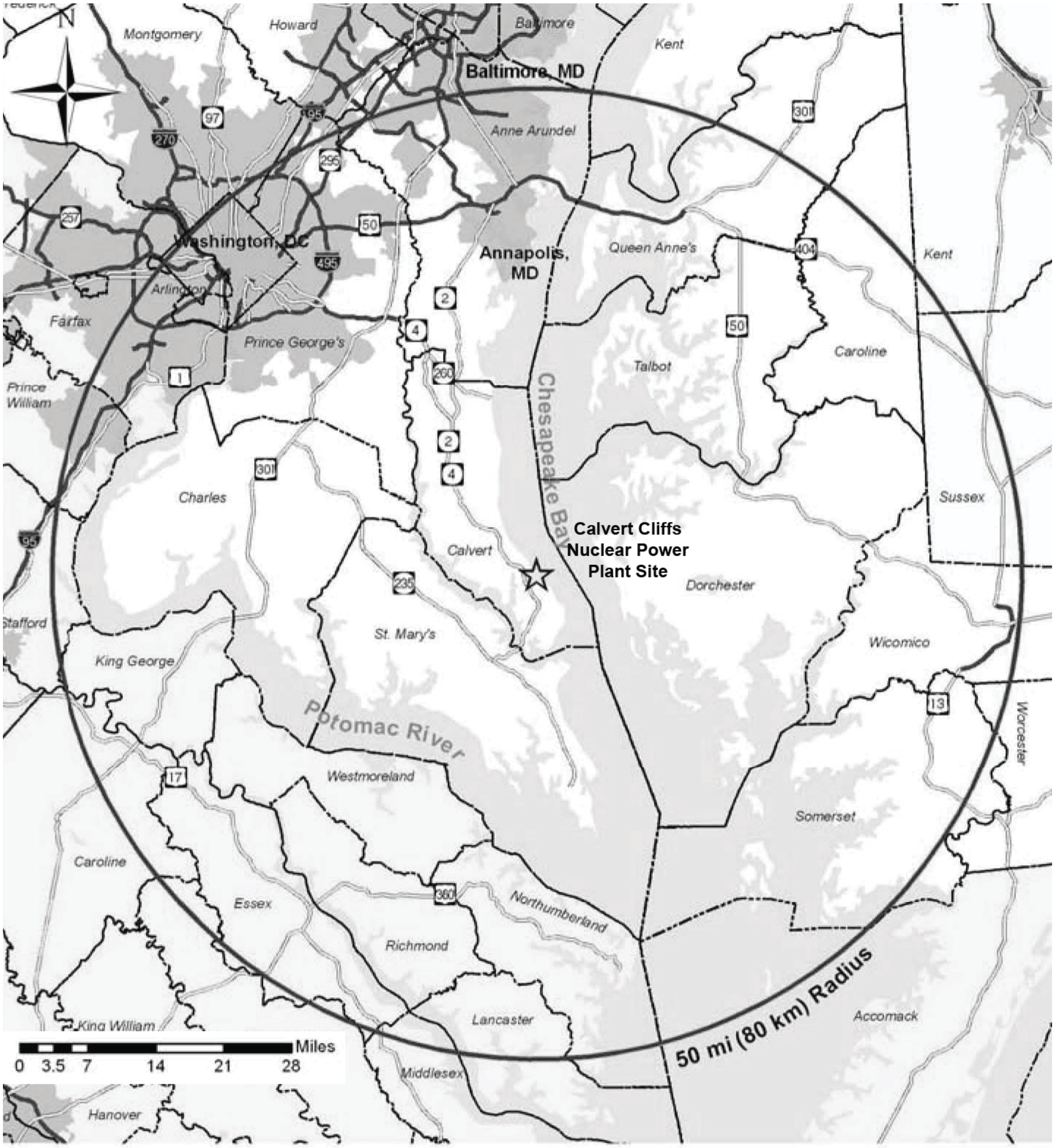

Figure 1. Location of the Calvert Cliffs Site, 50-mi Region (UniStar 2009a)

Table 1. Federally Listed Estuarine and Marine Species Occurring in Calvert County

Scientific Name	Common Name	Federal Status
Acipenser brevirostrum	shortnose sturgeon	Endangered
Caretta caretta	loggerhead turtle	Threatened
Lepidochelys kempii	Kemp's ridley turtle	Endangered
Chelonia mydas	green turtle	Threatened
Dermochelys coriacea	leatherback turtle	Endangered

Source: NMFS 2008

2.0 Calvert Cliffs Site Description

The Calvert Cliffs site is located on the Chesapeake Bay about 60 mi south of Baltimore; 40 mi southeast of Washington, D.C.; 10.5 mi southeast of Prince Frederick, Maryland; and 7.5 mi north of Solomons, Maryland (Figure 1). The site comprises about 2070 ac adjacent to Chesapeake Bay in an unincorporated area of Calvert County, Maryland. The NRC has licensed two existing nuclear generating units at the Calvert Cliffs site, Calvert Cliffs Nuclear Power Plant (CCNPP) Units 1 and 2, that have a combined net electric generating capacity of approximately 1700-1780 MW(e). Units 1 and 2 use once-through cooling systems and obtain water from the Chesapeake Bay. The combined flow of CCNPP Units 1 and 2 intakes is about 5332 cfs. There are two shoreline water intake structures for the existing units that share a common forebay, and each unit has its own fish-return system. The two existing units also share a discharge pipe that enters the Chesapeake Bay north of the intake structure. South of the intake structure is a barge slip for offloading heavy replacement components. The barge slip has been used several times since 2001 to receive replacement steam generators, transformers, and vessel reactor heads, and it is likely that there would be occasional use of the facility in the future for continued operation of CCNPP Units 1 and 2, which could require future maintenance dredging (UniStar 2009b). Both existing units would remain and continue to operate and would not be affected by the proposed action.

The Chesapeake Bay is one of the largest estuary systems in the world and currently supplies cooling water for CCNPP Units 1 and 2. The Bay is very productive and is an important part of the cultural and economic fabric of the area. Much of the Chesapeake Bay, including the reach that encompasses Calvert County, is considered impaired, primarily because of low dissolved oxygen (DO) and increased nutrients and sedimentation from human activities. The Chesapeake Bay Program (CBP) oversees monitoring at selected locations throughout the Bay and has developed average seasonal conditions from 1985 to 2008. One station, known as CB4.4, is in the middle of the Bay, east of the Calvert Cliffs site. The average monthly surface water temperature at this location has ranged from about 38°F (February) to about 81°F (July; August) (MDNR 2009a). The average monthly surface water salinity at station CB4.4 is typically lowest in late spring, ranging from about 10 to 11 ppt (April through June), and highest in late fall, ranging from about 15 to 16 ppt (September through November) (MDNR 2009b). Average monthly DO concentrations at station CB4.4 have ranged from about 0.3–0.4 mg/L (July; August) to 9.0–10.0 mg/L (January through March) (MDNR 2009c). Average June through September DO concentrations have been hypoxic (less than 2.0 mg/L) (Wicks et al. 2007). The minimum DO concentrations during those months occasionally may be anoxic (less than 0.2 mg/L).

Sediments near the CCNPP barge dock area primarily were composed of sand (94 to 96 percent) and gravel (2 to 5 percent) with a small percentage of clay (EA Engineering 2007) and were typical for the general region (Llansó et al. 2007). Total organic carbon (TOC) in the sediments ranged from about 2.4 to 3.1 percent. Most organic compounds analyzed in the CCNPP sediments were reported as not detected (EA Engineering 2007). The concentrations of metal compounds that were detected in the sediments were such that effects are expected to be rare (Buchman 2008). The benthic infaunal community found near the barge dock was generally sparse and comprised relatively few taxa (EA Engineering 2007) and were generally similar to the regional community (Llansó et al. 2007).

3.0 Proposed Federal Actions

The proposed Federal actions are the issuance of a COL for the construction and operation of a new nuclear reactor at the Calvert Cliffs site pursuant to 10 CFR 52.97 and the decision regarding a DA permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of "construction" to those activities that fall within its regulatory authority in 10 CFR 51.4. Many of the activities required to construct a nuclear power plant are not part of the NRC action to license the plant. Activities associated with building the plant that are not within the purview of the NRC action are grouped under the term "preconstruction." Preconstruction activities include clearing and grading, excavating, erection of support buildings and transmission lines, and other associated activities. These preconstruction activities may take place before the application for a COL is submitted, during the staff's review of a COL application, or after a COL is granted. Although preconstruction activities are outside the NRC's regulatory authority, many of them are within the regulatory authority of local, State, or other Federal agencies. The distinction between construction and preconstruction is not carried forward in this BA, and they are being discussed together as construction activities for the purposes of this joint consultation.

The Corps action is the decision whether to issue a permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for proposed structures in and under navigable waters and the discharge of dredged, excavated, and/or fill material into waters of the United States, including jurisdictional wetlands.

Prerequisites to construction activities include, but are not limited to, documentation of existing site conditions within the Calvert Cliffs site and acquisition of the necessary permits (e.g., COL, local building permits, a National Pollutant Discharge Elimination System (NPDES) permit, a Clean Water Act Section 404 permit, a General Stormwater Permit, and other State and local permits). After these prerequisites are completed, planned construction activities could proceed and would include all or some of all the activities identified in 10 CFR 50.10(a)(1). Following construction, no separate operating license would be required.

Briefly, the construction and operation activities that could affect Federally protected species based on habitat affinities and life-history characteristics and the nature and spatial and temporal considerations of the activity are:

Construction

- Dredging and modification of the existing barge slip, including a sheet-pile wall and a stone apron, on the Chesapeake Bay shoreline
- Installation of the cooling water intake system including new sheet pile, armor removal, armor installation, and dredging, including the fish-return system
- Installation of the cooling water discharge system
- Increased vessel traffic associated with the construction activities.

Operation

- Impingement, entrainment, and entrapment associated with the cooling water intake system
- Discharge plume from the cooling water system (thermal, chemical, and physical effects)
- Maintenance dredging of the barge slip.

The construction footprint for the proposed Unit 3 and all associated facilities would cover about 460 ac, including about 175 ac of previously disturbed ground. UniStar has proposed to build and operate an AREVA NP, Inc. U.S. EPR design pressurized water reactor steam electric system, which is rated at 4590 MW(t) with a net electrical output of 1562 MW(e). Unit 3 would require cooling water intake and fish-return facilities that are separate from CCNPP Units 1 and 2 and would also have a separate plant access road and protected area. The proposed circulating water supply system (CWS) would be closed-cycle using a mechanical-draft cooling tower with plume abatement (UniStar 2009a). The project would affect about 5.7 ac of tidal open waters.

The existing transmission system for CCNPP Units 1 and 2, which consists of two circuits, would also be used to service Unit 3. No new transmission corridors would be constructed outside the construction footprint. Operation of the transmission system is not expected to affect Federally protected species in the Chesapeake Bay.

3.1 Cooling Water Intake System

A 180-ft-long sheet-pile wall, embedded 15 ft into the Bay bottom, would be built to extend from the existing baffle wall for CCNPP Units 1 and 2 to the shoreline south of the present intake forebay to create a 9000-ft^2 (0.21-ac) wedge-shaped pool that would become the intake embayment for the new unit (Figure 2) (UniStar 2008b). The wall would be built of steel sheet piling supported by 30-in.-diameter soldier piles placed on 10-ft centers. The new baffle wall would not have an opening that would allow the new wedge-shaped pool to communicate directly with the Bay. Therefore, Unit 3 would share the embayment now used by Units 1 and 2. A 50-ft section of shoreline armoring would be removed prior to the wall installation. The construction of the sheet-pile wall would take about 2 months. Once the wall is in place,

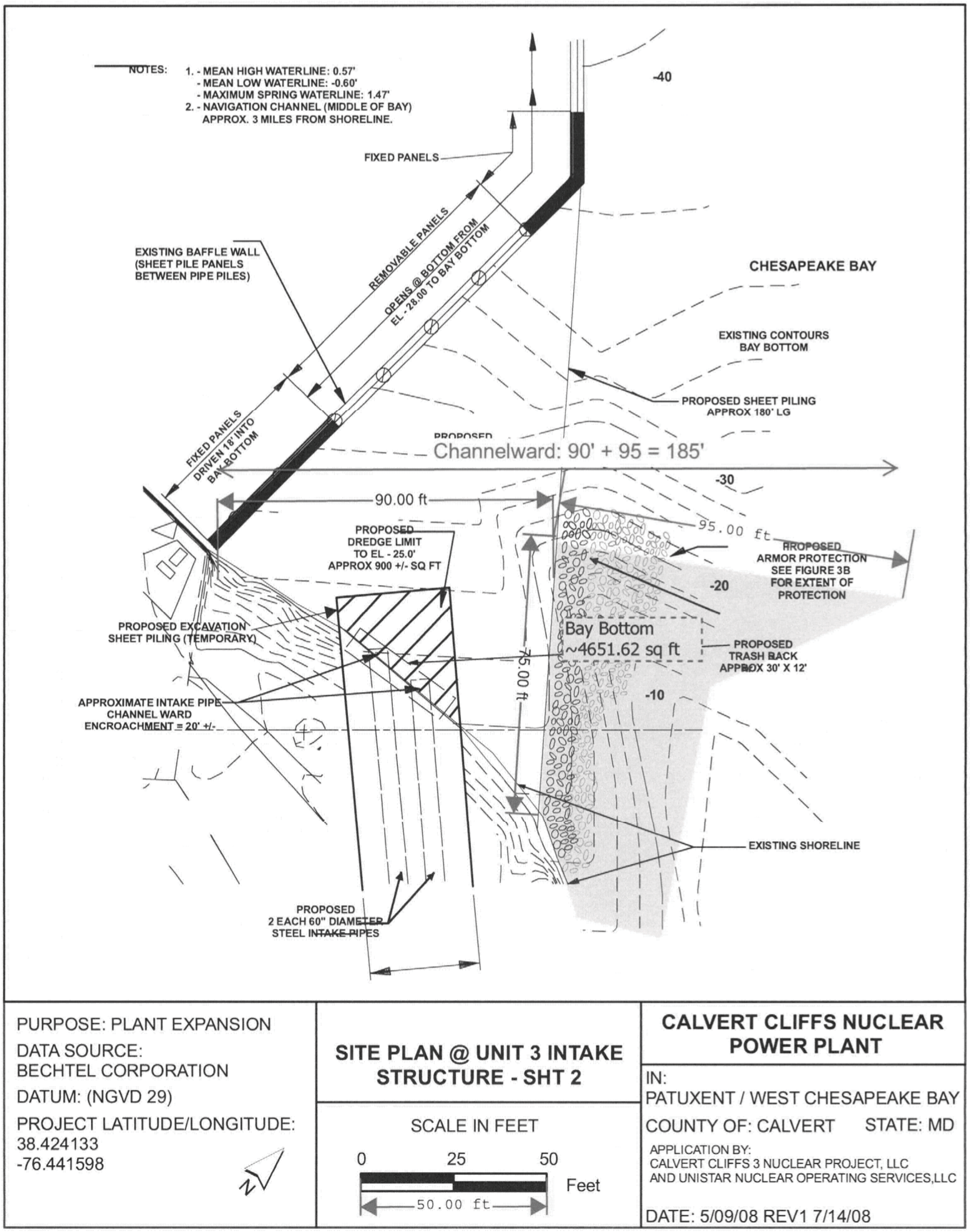

Figure 2. Site Plan at Unit 3 Intake Structure (UniStar 2009d)

about 60 ft of shoreline armor within the wedge-shaped pool would be removed, and a temporary sheet-pile wall would be installed upland along the intake water pipe route. The upland sheet-pile wall would extend about 30 ft into the wedge-shaped pool to create a small area that would be dewatered to facilitate dredging of a 30-ft by 30-ft area to a depth of 25 ft (900 ft^2; 0.02 ac). This excavation would house two 60-in.-diameter intake pipes that would extend about 20 ft channelward. The pipes would have trash racks but no screens at their openings. The intake piping would be perpendicular to the tidal flow of the Bay to minimize the component of the tidal flow parallel to the intake-area flow, reducing the potential of organisms entering the common forebay shared by the CWS and safety-related ultimate heat sink (UHS) intake structures for Unit 3. The flow velocity from the Bay into the existing intake area and the expected flow into the Unit 3 intake pipes are both less than 0.5 fps. About 80 ft of the shoreline within the pool would be armored, with the armoring extending about 10 ft from shore. The new sheet-pile wall would be armored by placing riprap on the Bay bottom extending about 75 ft from the shoreline and about 25 to 95 ft toward the channel (UniStar 2009d). The armoring would be added to the Bay bottom as a series of four overlying layers ranging from washed gravel on the bottom to large quarry rock (average about 2 tons each rock) on the top (UniStar 2009d). The overall thickness of the armoring would vary according to the water depth. About 4650 ft^2 (0.11 ac) of the Bay bottom would be armored (Figure 2). The temporary sheet-pile wall within the wedge-shaped pool would be removed. The construction of the intake system would take about 4 months.

The two intake pipes would be placed in trenches dug on land and would extend about 500 ft south to the location of common forebay (UniStar 2009a). The common forebay would be 100 ft long by 80 ft wide and would be about 12 ft deep (UniStar 2009a). The Unit 3 CWS makeup water intake structure would be a concrete structure about 78 ft long and 55 ft wide with individual pump bays. Three 50-percent-capacity, vertical, wet-pit CWS makeup pumps would provide up to 44,000 gpm of makeup water. The Unit 3 UHS makeup water intake structure would be a concrete structure about 75 ft long and 60 ft wide with individual pump bays. Four 100-percent-capacity, vertical, wet-pit UHS water makeup pumps would provide up to 3000 gpm of makeup water. Flow velocities at the CWS and UHS makeup structures would be less than 0.3 fps and less than 0.1 fps, respectively.

For the CWS makeup water intake structure, water would flow from the common forebay through trash racks and two traveling screens into a smaller forebay that feeds the three CWS makeup pumps. The trash bar spacing would be 3.5 in. from center to center. Debris collected by the trash racks would be collected in a debris basin for cleanout and disposal as solid waste. The traveling screens for each system would be dual-flow screens with a double-entry/center-exit flow pattern. The screen panels would be metallic or plastic mesh with a mesh size of 3/8 in. or smaller (UniStar 2009b). The screens would be mechanically rotated above the water for cleaning with a pressurized water spray. Screen wash water would be supplied by two screen wash pumps. Through-screen flow velocities would be less than 0.5 fps. For the UHS makeup intake structure, water flows from the common forebay to each makeup pump after passing through a trash rack and dual-flow screen. The screens for the UHS pumps would not be equipped with a fish-return system (UniStar 2009c).

3.2 Fish-Return System

A fish-return system similar to those for CCNPP Units 1 and 2 would be built (UniStar 2008b) for the Unit 3 CWS pumps. The final design details have not been determined. Organisms would enter the return system at the intake screens for the CWS intake structure located at the common forebay after the organisms traveled through the pipe originating at the shoreline intake about 500 ft north of the forebay. The UHS pumps would not be connected to the fish-return system because the UHS makeup system only operates periodically or in the case of a design-basis accident (DBA) (UniStar 2009c). The return system would be located on the east (Bay) side of the Unit 3 intake forebay about midway between the CCNPP Units 1 and 2 intake forebay and the existing barge dock. The proposed fish-return outfall pipe would extend about 40 ft into the Bay with end of the pipe emerging from the Bay floor but remaining below mean lower low tide level (UniStar 2009a). This design was chosen to minimize any drop at the exit point into the Chesapeake Bay (UniStar 2009a). Any bends in the pipes would be greater than 90 degrees to facilitate fish passage. The walls and joints of the pipes would be smooth to reduce potential fish abrasion (UniStar 2009b). About 40 linear ft of shoreline armoring would be removed to allow installation of the return pipe. A 6-ft-deep trench extending 40 ft from shore would be dredged to house the return pipe. The trench would be about 5 ft wide at the bottom and about 65 ft wide at the level of the Bay floor (UniStar 2008b). An area of about 2600 ft^2 would be directly disturbed by the dredging. After the return pipe is placed in the trench, the trench would be backfilled with the dredged sand and stone material. A 10-ft by 10-ft section of the Bay bottom would be covered to a depth of 2 ft by a riprap apron. The shoreline armoring would be replaced. The existing fish-return systems for CCNPP Units 1 and 2 would not be modified.

3.3 Cooling Water Discharge Structure

The 30-in.-diameter cooling water discharge pipe would be placed in a 550-ft-long trench dredged in a trapezoidal form at a 5:1 side slope to prevent sloughing of the trench sides (UniStar 2008b) (Figure 3). The trench bottom would range from 3 to 6 ft wide, and the maximum width of the trench at the level of the Bay bottom would be about 70 ft. UniStar proposes to use a three-port diffuser, which would rise 3 ft above the bed of the Chesapeake Bay, located 550 ft from the shoreline. Each diffuser port would direct water out of the pipe at an angle of 22.5° above horizontal (Figure 3). A minimum area of about 38,500 ft^2 (0.88 ac) of Bay bottom would be directly disturbed by the pipeline installation. About 7000 yd^3 of material would be dredged for the pipe installation. About 5,800 yd^3 of this material would be reused to backfill the trench with the remainder (about 1200 yd^3) being deposited at an existing upland (non-wetland), environmentally controlled disposal area at the Lake Davies laydown area on the site. Riprap with a median diameter of 12 in., and filter fabric would be placed on top of the backfilled material to provide a minimum 4 ft cover over the pipe. The riprap would be placed within discharge pipe trench to the top of the trench at the original grade of the Bay bottom, but would not extend above the existing Bay bottom. A 2-ft-deep riprap area would be placed to extend approximately 10 ft on each side of the 40-ft-long multiport diffuser. The area of Bay bottom covered by this riprap is about 800 ft^2.

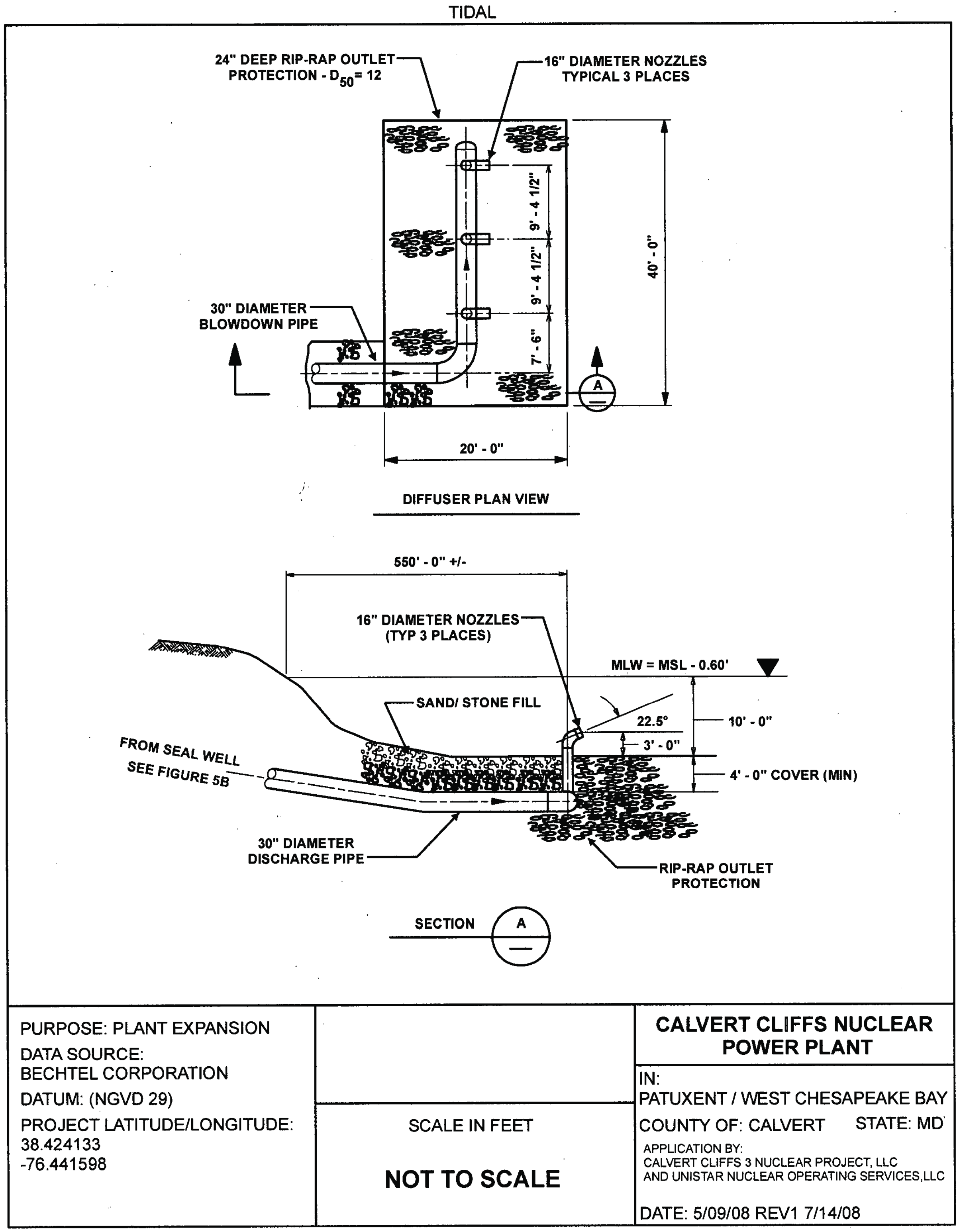

Figure 3. Details of the Proposed Unit 3 Cooling Water Discharge Outfall (UniStar 2008b)

3.4 Barge Dock Improvements

The existing barge slip for CCNPP Units 1 and 2 would be restored and extended to re-establish use during the construction of proposed Unit 3. An area about 1500 ft long by 130 ft wide (average width), covering about 195,000 ft^2 (4.5 ac) of Bay bottom would be dredged to a bottom depth of −16 ft mean low water (UniStar 2008b). This would require the mechanical dredging of about 50,000 yd^3 of bottom substrates. UniStar considers the removal of sediment from about 1065 ft of the total length, about 45,000 yd^3, as maintenance dredging, with the removal of material from the remaining 435 ft, about 5000 yd^3, as new dredging beyond the original dredging limits. This extension is necessary to extend the proposed channel to tie into the same depth as the existing natural depth contour of −16 ft mean low water. Prior to dredging, two existing crane piles and one mooring bollard may be removed from the channel area (UniStar 2008b) (Figure 4). Additional maintenance dredging would remove silt that has accumulated in the shoreward portion of the barge dock area during the past 30 years, altering the normal flow pattern from an existing culvert outfall. The area would be restored by installing a 12-ft by 90-ft concrete apron and a 90-ft-wide sheet-pile wall at the beach end of the area and building a 40-ft long by 40-ft wide by 2-ft deep riprap apron that would extend about 40 ft into the Bay, covering about 1600 ft^2 (0.04 ac). The sheet-pile wall would be constructed of steel sheet-piling supported by 30-in.-diameter soldier piles. The restoration would allow the discharge from the culvert outfall to flow directly in the Bay. The restoration is expected to take about two weeks.

Once the barge dock area has been refurbished, it would be used by barges that may be as large as 200 ft long and 50 ft wide. The numbers of barges that would be used has not been specified. Typically, the barges used are about 35 ft wide. Barge drafts range from 2 ft to 11 ft, depending on the load. UniStar expects that the barge dock would be in use for about five years during the construction, but stated that although there are no specific plans for maintenance dredging, eventual replacement of major components could require dredging in the future. UniStar has requested permission from the Corps to conduct maintenance dredging for 10 years (USACE 2008). The dredged material removed from the barge slip would be used during the plant construction as sand bedding for underground pipe installation or deposited at an existing upland (non-wetland), environmentally controlled disposal area onsite that was used for previous dredge disposal. The dredged material would be characterized prior to use or disposal.

4.0 Protected Estuarine and Marine Species Descriptions

This section describes the life history and habitat use for Federally listed estuarine and marine species that may occur on or near the Calvert Cliffs site (Table 1).

4.1 Shortnose Sturgeon (*Acipenser brevirostrum*)

The shortnose sturgeon is a long-lived fish species belonging to the Order Acipenseriformes, which includes sturgeons and paddlefishes. The species, which is Federally endangered, occurs along the western Atlantic coast from the Saint John River, New Brunswick, to the St.

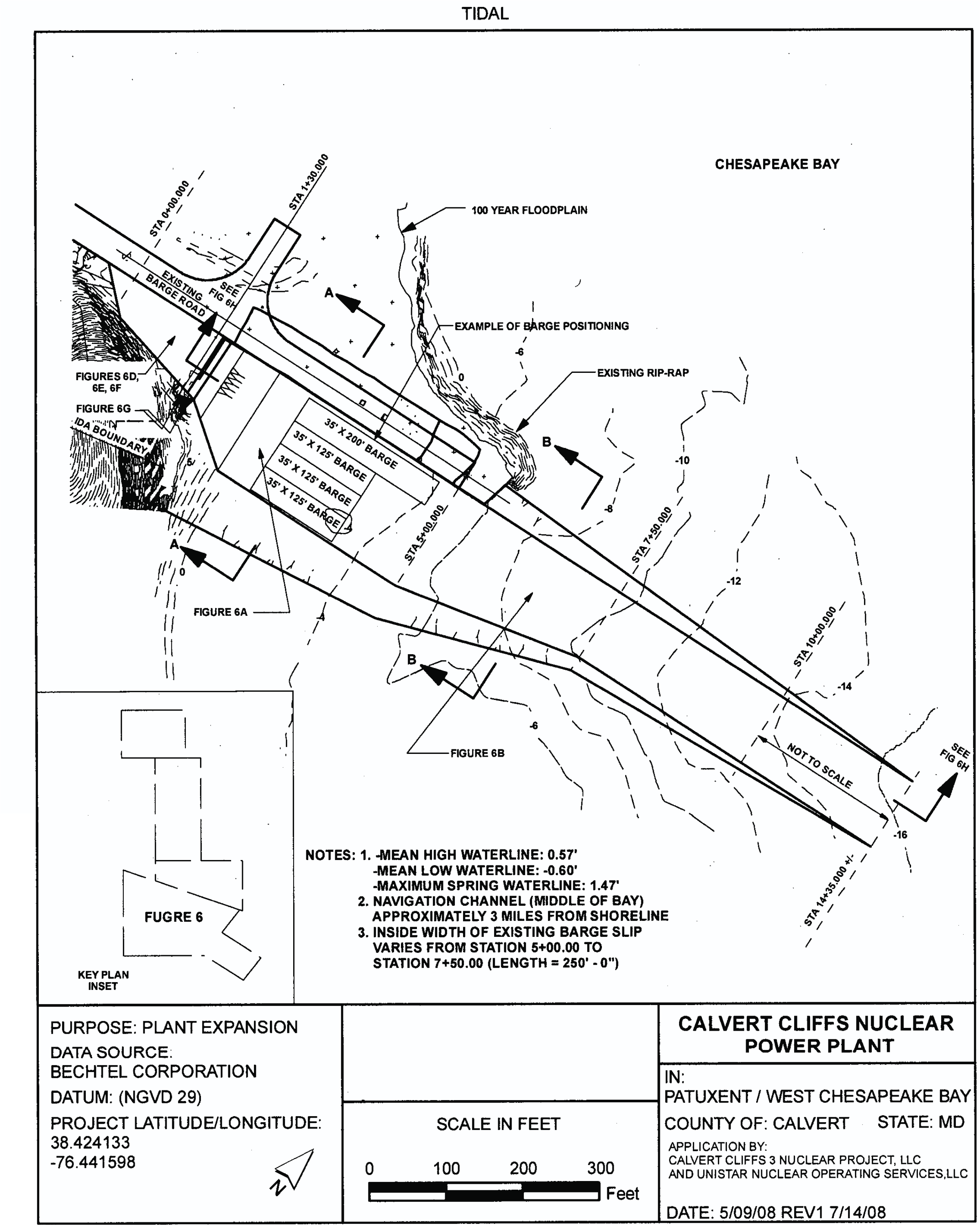

Figure 4. Proposed Restoration of Barge Slip (with existing contours) for the Construction of Proposed Unit 3 (UniStar 2008b)

Johns River, Florida (Kynard 1997; Murdy et al. 1997), with Chesapeake Bay the center of its distribution (Kynard et al. 2009). The range of the shortnose sturgeon coincides considerably with that of the Atlantic sturgeon (*Acipenser oxyrinchus*), although the latter ranges to the Gulf of Mexico (Murdy et al. 1997). The NMFS recognized 19 shortnose sturgeon population segments along its range, roughly divided into northern and southern regions (NMFS 1998). The northern region includes populations from about the Chesapeake Bay and Delaware River northward, and the southern region includes populations from about the Cape Fear River, North Carolina southward. The status of shortnose sturgeon in Chesapeake Bay is discussed in Section 4.1.2 of this BA.

The principal reasons for the severe declines in the abundance that led to the eventual listing of shortnose sturgeon as endangered were pollution and overfishing (NMFS 1998). Another important factor was the damming of many rivers used for spawning that restricted fish to lower-quality habitats. The U.S. Fish and Wildlife Service (FWS) listed the shortnose sturgeon as endangered in 1967 (NMFS 1998). NMFS assumed responsibility for the species in 1974. A recovery plan was prepared in 1998 (NMFS 1998). The 19 population segments considered by NMFS were not based on morphological or genetic differences among the various segments but were linked to major rivers or estuaries along the coast and differences in life-history properties among populations (Walsh et al. 2001; Wirgin et al. 2005). They do not represent distinct population segments (DPS) as defined under the ESA. Wirgin et al. (2005) studied the mitochondrial DNA of fish from 11 of the 19 segments to examine the population structure along the entire species' range. Wirgin et al. (2005) found that their data supported the possible existence of many genetically distinct populations of shortnose sturgeon in tributaries along the western Atlantic coast. However, these populations did not strictly segregate according to geographic region. A more recent study based on data from more sturgeons, including additional fish from the Potomac River, generally supported the population segments identified by NMFS (Wirgin et al. 2009). However, four populations, including the one found in the Chesapeake Bay, were not genetically distinct from the two closest neighboring populations. NMFS initiated a status review for the shortnose sturgeon in November 2007 to update the biological information on the status of the species and to consider if shortnose sturgeon should be identified and assessed as DPS rather than as a single unit (72 FR 67712).

4.1.1 Shortnose Sturgeon Biology

Shortnose sturgeon, which grow to a maximum length of 4.6 ft, is one of the smallest sturgeon species. Shortnose sturgeon are freshwater amphidromous fish, living primarily in freshwater or in low-salinity estuaries and occasionally swimming into higher salinity coastal waters to feed (Bemis and Kynard 1997; Murdy et al. 1997; NMFS 1998). Shortnose sturgeons spend most of their lives in their birth river systems, only rarely moving into marine waters (NMFS 1998). There is considerable latitudinal variation in the life-history characteristics of the species (Kynard 1997), which makes it difficult to identify specific features of sturgeons living in Chesapeake Bay. The information presented below is based primarily on northern populations. Shortnose sturgeons mature relatively late, with females maturing at about 12 to 18 years of age and males maturing at about 10 to 11 years of age at the most northern spawning location (Dadswell et al. 1984). Individuals mature much more quickly in southern locations. Individual shortnose sturgeon may not spawn every year and may go as long as 11 years between spawning in northern areas (Dadswell et al. 1984). Adults spawn from February to April, generally over the rocky bottoms in deeper channels of swiftly flowing rivers (Dadswell et al. 1984; Murdy et al. 1997). Spawning may be strongly related to temperature (Dadswell et al. 1984), although river flow conditions must be appropriate before ovulation and spawning occur (Kynard 1997). Females deposit eggs that attach to the bottom substrate and remain there for a few days (Kynard 1997). The eggs hatch into secretive, poorly swimming yolk-sac larvae that develop into feeding larvae within several days. The feeding larvae are able to move downstream but stop migrating before reaching the estuary. Growth of young-of-the-year fish is fairly rapid with young often reaching lengths of about 6 in. or more during the first season (Dadswell et al. 1984). Young-of-the-year sturgeons stay in freshwater (Kynard 1997). Young sturgeons, aged 1 to 3 years, often join adults in freshwater concentration areas that may be favorable places to feed. Adults and juveniles continue to associate in groups in estuaries and forage at the freshwater-saltwater interface (Kynard 1997). In the Chesapeake Bay, this interface, or salt front, typically occurs about 12 mi from the Susquehanna River mouth but can move several miles up or down the estuary because of changes in water flow from the river or strong up- or down-estuary wind events (North and Houde 2001; North et al. 2004). These groups at the salt front persist primarily during spring and summer, after which adults may swim to deeper waters in lower parts of estuaries to overwinter (Kynard 1997). Juvenile shortnose sturgeon feed primarily on benthic insect larvae and crustaceans, whereas the primary foods for adults are mollusks (Murdy et al. 1997; NMFS 1998). Northern adults typically stop feeding in November (Kynard 1997).

One of the primary threats to shortnose sturgeon is the blocking of natal rivers by dams or other obstructions. Shortnose sturgeon cannot be fished directly but are often caught as bycatch with other targeted fisheries, especially the American shad (*Alosa sapidissima*) gillnet fishery (Kynard 1997).

4.1.2 Shortnose Sturgeon in Chesapeake Bay

The occurrence and status of the shortnose sturgeon in Chesapeake Bay are enigmatic. Historically, the shortnose sturgeon was found in the Potomac and Susquehanna Rivers and probably in other major Chesapeake Bay tributaries, although historical records apparently were based on few verified records (Dadswell et al. 1984). However, populations have been decimated by loss of critical spawning habitat primarily from damming of rivers and pollution (Murdy et al. 1997). There were few published records of shortnose sturgeon occurrence in the Bay before 1996. Baltimore Gas and Electric Company (BGE) researchers captured a shortnose sturgeon during trawl studies near the Calvert Cliffs site in 1979 (UniStar 2008b). No shortnose sturgeon occurred in the impingement samples collected at CCNPP Units 1 and 2 from 1975 to 1995 (Ringger 2000).

A reward program conducted by the State of Maryland for Atlantic sturgeon that were captured during commercial fishing for other species yielded 40 shortnose sturgeon, most from the upper Bay (Welsh et al. 2002). Many of these sturgeon were tagged and released. Three sturgeon tagged in Chesapeake Bay were found in the Chesapeake and Delaware Canal or in the Delaware River.

Small pieces of fins collected from many of the captured sturgeon were used for genetic analyses. Comparison of genetic data from sturgeons collected over several river systems showed that sturgeons from Chesapeake Bay and Delaware Bay were essentially indistinguishable (Wirgin et al. 2005; Wirgin et al. 2009). Shortnose sturgeons from the Potomac River were shown to be a genetic subset of sturgeons from the larger Chesapeake Bay and Delaware River systems. One possible explanation for this extreme similarity is shortnose sturgeon may no longer reproduce in Chesapeake Bay, and the individuals sampled there were seasonal migrants from the Delaware River (Wirgin et al. 2005; Wirgin et al. 2009). If shortnose sturgeon populations that existed in Chesapeake Bay before the 20th century were genetically distinct from those in the Delaware River, this distinction may have been affected by the major land barrier separating the two that was removed with the construction of the sea-level Chesapeake and Delaware Canal in the late 1920s.

Recent studies of the shortnose sturgeon in the Potomac River showed that a reproducing, resident population may eventually be re-established in the Bay. A study from 2004 to 2007 documented the movements of two female shortnose sturgeons in the Potomac River (Kynard et al. 2007). A third female was tagged after the completion of the study (FWS 2009). All three female sturgeons were egg-bearing. One female, which had late-stage eggs when first caught in 2005, had not spawned when recaptured in the spring 2006 at about river kilometer (rkm) 185 near Fletcher's Landing (Kynard et al. 2009). This female was captured again in the summer 2007 and had early-stage eggs. A second female bearing late-stage eggs was caught in early spring 2006 (Kynard et al. 2009). The female that was tracked from 2005 to 2007 spent the summer-winter period in a 14.9 mi (24 km) part of the Potomac downriver of Craney Island and undertook a possible spawning migration upriver in the spring 2006. The 2006 female used a larger summer-winter range (about 48.5 mi) that extended from the capture point at rkm 63 to near Craney Island (Kynard et al. 2009). The 2005 female was tracked again in April 2009, swimming along 93-mi stretch of the river from Coles Point, Virginia (rkm 35) to Fletcher's Landing (FWS 2009). The trip began in early April and took 11 days, during which the female reached a top speed of 2.6 km/hr. This female may live in the Potomac all year (FWS 2009).

Despite the capture of egg-bearing females in the Potomac, there is no evidence yet that reproduction has been successful in the river. No shortnose sturgeon early life stages have been caught in the Potomac River despite sampling efforts designed to capture them (Kynard et al. 2009; FWS 2009). No Chesapeake Bay tributaries are known to support reproducing populations (FWS 2009). The occurrence of egg-bearing female shortnose sturgeons in the Potomac River is significant because it confirms the presence of suitable habitat for the species and suggests that a breeding population eventually may be established in the river. Kynard et al. (2009) offered that the surgeons now inhabiting the river could represent a remnant population or could be colonizers from the Delaware River because of the genetic similarity between the two fish groups.

4.2 Sea Turtles

Four species of sea turtles may occur in Chesapeake Bay during part of a year (Musick 1988). The two most common species are the loggerhead turtle (*Caretta caretta*) and Kemp's ridley turtle (*Lepidochelys kempii*) (Mansfield 2006). The green turtle (*Chelonia mydas*) and the leatherback turtle (*Dermochelys coriacea*) also occur in the Bay (VIMS 2000). Both occur primarily in the lower Bay. Most occurrences in the Bay are larger juveniles that use estuaries as feeding habitat (Mansfield 2006). Turtles visit Chesapeake Bay primarily in the spring and summer (VIMS 2000). Abundances of sea turtles are commonly estimated by counting the number of nesting females or directly counting the number of nests in which eggs have been deposited (Broderick et al. 2006). Abundances of males are often unknown. Recent estimates of turtle occurrence in lower Chesapeake Bay have been made by using aerial surveys (Mansfield 2006). Abundances of turtles within the Bay have decreased substantially since the 1980s. Spring and summer turtle abundances have declined by about 63 percent and 75 percent, respectively (Mansfield 2006). Mansfield (2006) suggested that these decreases in the Bay could be occurring because of reductions in the forage base, such as blue crabs.

Mansfield (2006) also studied turtles captured in pound nets located in Virginia waters at the mouth of the Potomac River, which provides a general indication of the relative commonness of the four species in the central Chesapeake Bay, closer to the Calvert Cliffs area. Loggerhead turtles, representing about 88 percent of the 436 turtles collected during the 22-year period from 1980 to 2002, were the most common. Kemp's ridley turtles accounted for about 12 percent of the turtles caught. Only one green turtle was caught, and no leatherback turtles were caught. Most of the turtles were caught between May and October. An unidentified species of sea turtle was impinged on the trash racks at the existing CCNPP facility in June 2001 (NRC 2001).

Sea turtles generally show natal homing behavior in which females return to the areas of their birth to lay eggs (Bowen and Karl 2007), although the precision of the homing varies according to species life style. Genetic studies indicated species that travel great distances to forage, such as leatherback turtles, are less precise in returning to natal beaches than those that do not travel long distances, such as loggerhead turtles (Bowen and Karl 2007).

All four sea turtle species face similar threats, with the primary threat being the unintentional capture by many types of fishing gear, including pound nets in Chesapeake Bay (NOAA 2008a, 2008b). Additional threats include harvesting of eggs, juveniles, and adults and disturbance of nesting sites. Predators, other than humans, may also significantly affect sea turtles. The primary predators on turtle adults include several large shark species, particularly tiger sharks (*Galeocerdo cuvier*) (Heithaus et al. 2008).

4.2.1 Loggerhead Turtle (*Caretta caretta*)

The loggerhead turtle is a Federally and State threatened species (MDNR 2007; NOAA 2008a) that is found in temperate and tropical seas around the around the world (NOAA 2008a). In the Atlantic Ocean, loggerheads range from Argentina to Newfoundland. Loggerheads in the Northwest Atlantic nest primarily on beaches from Alabama to southern Virginia (Conant et al. 2009). Eggs are laid between April and early September with hatching occurring about 2 months after laying (NOAA 2008a). Hatchlings emerge from the nest, crawl to the surf, and swim away from shore for several days. Those from Northwest Atlantic rookeries eventually are caught by the Gulf Stream (McClellan and Read 2007). Juveniles eventually get transported to oceanic zones where they remain for 7 to 12 years (NOAA 2008a). These oceanic juveniles migrate to nearshore waters with estuaries, such as Chesapeake Bay, providing important habitat (NMFS and FWS 2007a). However, this migration to nearshore waters is often reversed with individuals moving back and forth between coastal and oceanic waters for several years (McClellan and Read 2007). Juveniles show a certain degree of homing, returning from the oceanic regions to areas often relatively close to their birth rookeries (Bowen et al. 2004). Loggerheads in the southeastern U.S. may reach a length of 36 in. and weigh as much as 250 lb (NOAA 2008a).

The Chesapeake Bay is used primarily by juveniles, but it is also frequented by adults in the summer. Loggerheads enter the Bay in April and May and leave with the arrival of cool waters in early to mid fall. Mitochondrial DNA analyses showed that about 64 percent of the loggerheads in the Bay were from rookeries in Florida, and the remainder were from rookeries in Georgia and South Carolina (Norrgard and Graves 1996). The Georgia and South Carolina rookeries account for only about 10 percent of the active loggerhead nesting in the southeastern U.S., and their relatively high contribution to the Chesapeake Bay's loggerhead population suggests that the Bay is an important foraging area for juveniles (Norrgard and Graves 1996). The pound net entrapment study recorded the carapace lengths of trapped loggerhead turtles as ranging from about 18 to 45 in. (Mansfield 2006), which provides some indication of the size of loggerheads found in the Bay.

Loggerheads have large heads and strong jaws that enable them to feed on hard-shelled prey. In the lower Chesapeake Bay area and coastal Virginia, loggerhead diet has shifted from invertebrates to fish since the 1980s (Seney and Musick 2007). Horseshoe crabs were a prominent prey in the 1980s, with blue crabs becoming predominant in the late 1980s and early 1990s. After the mid-1990s, Atlantic menhaden (*Brevoortia tyrannus*) and Atlantic croaker (*Micropogonias undulatus*) became important prey. The changes probably resulted from declines in the invertebrate populations that forced the turtles to feed on discards or trapped fish.

Concern over declining loggerhead populations had been ongoing for at least 30 years when the loggerhead was listed as Federally threatened (NMFS and FWS 1991a). Turtle abundance data away from nests are scarce, and it is generally accepted that estimates of nesting females or counting nests are reasonable guides to overall population size (NMFS and FWS 2007a). The most recent trends show significant declines in nesting females in many parts of the world, particularly in the South Florida Nesting Subpopulation, which has declined 39.5 percent since 1998 (NMFS and FWS 2007a). Recent conservation activities include revision of the 1991 recovery plan to address recovery of the Northwest Atlantic loggerhead population (NMFS and FWS 2008) and the completion of a status review to determine whether the western North Atlantic loggerhead population, or those in other areas, represent DPS (Conant et al. 2009). The revised recovery plan describes five recovery units that are defined by geography or political boundaries. Loggerhead turtles that occupy Chesapeake Bay originate from either of two recovery units. The Northern Recovery Unit includes breeding beaches from Georgia to Virginia, and the Peninsular Florida Recovery Unit encompasses beaches from the Georgia border to Pinellas County on Florida's west coast. The two Recovery Units have averaged a total of about 70,000 nests per year since 1989, which accounted for about 99 percent of the Northwest Atlantic population nests. The number of nests in each Unit has decreased about 1.3 percent to 1.6 percent per year since the 1980s.

Conant et al. (2009) determined that the global loggerhead turtle population can be differentiated into nine DPS. Each DPS is discrete from all other segments and is significant to the species. One DPS, the Northwest Atlantic DPS, includes all turtles that frequent Chesapeake Bay. Conant et al (2009) concluded that the Northwest Atlantic DPS was at risk for extinction primarily because of juvenile and adult mortality as bycatch from recreational and commercial fishing. Habitat destruction, such as that from pollution, channel dredging, or climate change, may also contribute to population declines.

4.2.2 Kemp's Ridley Turtle (*Lepidochelys kempii*)

The Kemp's ridley turtle is a Federally and State-endangered species (MDNR 2007; NOAA 2008b) that occurs along the Atlantic coast from Florida to New England and throughout the Gulf of Mexico (NOAA 2008b). About 95 percent of Kemp's ridley turtles nest in Tamaulipas State, Mexico, although some nesting has occurred in within the United States in the Carolinas and Florida. Nesting occurs from May to July, with females laying two to three clutches. Eggs hatch within about two months, and young turtles move to offshore waters. Juveniles drift in association with the seaweed *Sargassum* sp. for about 2 years and return to near coastal areas as subadults. Juveniles and adults typically remain fairly close to shore during migrations, usually in waters less than 60 ft deep (Renaud and Williams 2005). Kemp's ridley turtles are the smallest marine turtles, reaching a length of about 28 in. and a weight of 100 lbs (NOAA 2008b). Although Kemp's ridley turtles are opportunistic feeders that typically consume prey that are locally abundant (Witzell and Schmid 2005), most probably feed on swimming crabs, supplemented with jellyfish, mollusks, other types of crabs, and fish. Juvenile turtles in Florida fed on tunicates (*Molgula occidentalis*) that were abundant on hard bottoms (Witzell and Schmid 2005). Blue crabs and spider crabs (*Libinia* spp.) are the most important prey in Chesapeake Bay (Seney 2003). Abundance estimates are based on the number of nesting females. Kemp's ridley turtles experienced severe population declines from the 1940s to the 1980s, and a recovery plan for the species was developed in 1992 (NMFS and FWS 1992a). Populations started to increase in the 1990s (NMFS and FWS 2007b). Numbers of nesting females have continued to increase in the 2000s. In 2006, about 100 nests were found in the U.S. The primary historical threat to Kemp's ridley turtles was egg collection, but it has not been a significant issue since nesting beaches were protected in 1966 (NOAA 2008b).

Kemp's ridley turtles enter the Chesapeake Bay in spring and remain until the water cools in the fall (Musick 1988). After leaving the Bay, the turtles move offshore to the south, most likely overwintering between North Carolina and central Florida (Morreale and Standora 2005). While in the Bay, these turtles typically frequent shallower waters than loggerheads. Sizes of Kemp's ridley turtles in the Chesapeake Bay range from about 6 to 25 in., in curved carapace length (Keinath et al. 1994), the largest size is about that of an adult. Keinath et al. (1994) estimated that about 200 to 1100 Kemp's ridley turtles inhabit the lower Bay during the summer. There is a historical record of Kemp's ridley turtle near the Calvert Cliffs site (Hardy 1962). The record is based on the identification of a beak from a dead turtle. Many young Kemp's ridley turtles inhabit the Chesapeake Bay during the summer, but most of these live in the lower Bay (UniStar 2008a).

4.2.3 Leatherback Turtle (*Dermochelys coriacea*)

The leatherback turtle is a Federally and State endangered species (MDNR 2007; NOAA 2008c) that is found worldwide in many ocean habitats. In the western Atlantic, it ranges from the Gulf of Maine to the Caribbean and is found in the Gulf of Mexico (NOAA 2008c). The leatherback turtles in the Atlantic are tentatively considered to belong to seven stocks, largely based on primary nesting sites (TEWG 2007). The primary nesting areas are in South America and West Africa, with minor sites in the Caribbean Sea and Florida. Most of the nesting in Florida occurs along the Atlantic coast from Brevard County to Palm Beach County (TEWG 2007). Females may nest several times during the season. Eggs hatch about 2 months after being laid. Young turtles, about 2 in., in carapace length, quickly move offshore to pelagic habitats. Little is known about the distribution of juveniles, although they seem to occur in warmer waters (NOAA 2008c). After dispersing offshore, turtles are not usually seen again until they reach a large juvenile size of at least 59 in. carapace length and move into adult foraging areas (TEWG 2007). Adults return to nesting areas to reproduce. Leatherback turtles are the largest living reptiles with adults reaching lengths of about 6 ft and weighing as much as 1984 lb. Soft-bodied animals, such as jellyfish and salps, are the primary prey consumed by leatherback turtles (NOAA 2008c). Leatherbacks undertake long distance foraging treks across the Atlantic Ocean (Ferraroli et al. 2004; Hays et al. 2006). Leatherbacks often associate with large aggregations of jellyfish (Houghton et al. 2006). Population trends are not clear. The Atlantic has a larger population than the Pacific (NOAA 2008c). There is some indication that nesting in the Caribbean and Florida has been increasing. Nesting in Florida increased about tenfold from the late 1980s to the early 2000s, with about 800 to 900 nests found recently (NMFS and FWS 2007c; TEWG 2007). A recovery plan for the Atlantic and Caribbean populations of the leatherback turtle was developed in 1992 (NMFS and FWS 1992b).

4.2.4 Green Turtle (*Chelonia mydas*)

The green turtle population occurring in the Chesapeake Bay is Federally and State-threatened (MDNR 2007; NOAA 2008d). The Florida breeding population is Federally endangered. On the U.S. Atlantic coast, the green turtle ranges from southern Florida to Massachusetts. In the United States, the major nesting area is in Florida, where nesting typically occurs from June to September with most occurring in June and July (NOAA 2008d). Females nest about every 2 weeks and typically lay five clutches during the season (NOAA 2008d). The eggs hatch after about 2 months, and the young move to offshore areas where they spend several years. Older juveniles migrate to inshore areas where they mature. Adults may reach lengths of 3 ft, weigh 300 to 350 lb, and are the largest of the hard-shelled sea turtles (NOAA 2008d). Adult green turtles feed primarily on plants, such as seagrasses and algae, but may also consume soft-bodied invertebrates, such as jellyfish, sponges, and sea pens (NMFS and FWS 2007d). As with loggerhead turtles, green turtle abundance is estimated by the number of nesting females or nests with deposited eggs. Estimates have shown that green turtle populations worldwide have been declining for at least 100 years (NOAA 2008d), although six of eight nesting populations in the Atlantic Ocean, including the Florida population, have shown increases in the last few years (Broderick et al. 2006; NMFS and FWS 2007d). The numbers of green turtles nesting on Ascension Island in the South Atlantic may be about 285 percent larger than they were about 30 years ago (Broderick et al. 2006). Some green turtle populations may be affected by a disease, fibropapillomatosis. In Costa Rica, jaguars (*Panthera onca*) prey on turtles, but at a fairly low rate (Heithaus et al. 2008). A recovery plan for the Atlantic green turtle population was prepared in 1991 (NMFS and FWS 1991b).

5.0 Potential Environmental Effects of the Proposed Actions

This section describes the potential impacts from construction and operation of the proposed Unit 3 to Federally protected species in Chesapeake Bay.

5.1 General Construction Impacts

Impacts to the Federally protected species in Chesapeake Bay from construction of proposed Unit 3 would be associated mainly with the construction of new water intake and discharge systems; construction of a new fish-return system; and the refurbishing of the existing barge dock area, including dredging in Chesapeake Bay. These activities would result in temporary and permanent loss or conversion of aquatic habitat in the Chesapeake Bay.

The major construction events associated with building proposed Unit 3 that would affect aquatic resources in Chesapeake Bay share certain construction activities, such as dredging, pile driving, and armoring. All work would be conducted in accordance with Federal, State, and local permits. The Federally protected species in Chesapeake Bay likely would not be adversely affected by the installation of new onsite transmission facilities for the proposed Unit 3 because the facilities would be built on the uplands part of the Calvert Cliffs site.

The total proposed project would permanently affect about 248,000 ft^2 (5.7 ac) of tidal open waters. About 138,500 ft^2 (3.2 ac) of the tidal open water impacts would be from maintenance dredging, and about 109,000 ft^2 (2.5 ac) of impacts would be from new dredging. About 52,500 ft^2 (1.2 ac) of the new dredging would be backfilled.

5.1.1 Dredging and Pipeline Trenching

Dredging of the Bay bottom would be done by using shore-based or barge-mounted clamshell dredges to reestablish the channel on the south side of the existing CCNPP Units 1 and 2 barge dock and to create the trench for the cooling water discharge and the fish-return outfall pipelines. Dredging or pipeline trenching constitutes a major, localized impact to the benthos. Additional Bay bottom next to the pipeline trench would be disturbed by the placement of the dredged material for later use in the backfilling of the trench. Effects of dredging for the installation of the Unit 3 intake pipes would be minimized by construction of a sheet-pile cofferdam and dewatering system.

In addition to the physical removal of Bay bottom, dredging and pipeline trenching and backfilling increase the suspended sediment load in the water column. However, the surficial sediments in the area that would be dredged are primarily sandy (Section 2.0 of this BA) and likely would settle out of the water column relatively quickly. Some dredged material and water can be lost from the clam dredge as it is raised and deposited into the barge. The amount of material re-entering the water column as it is transferred from the barge to trucks would be small. The potential re-suspension of contaminants would not be a concern for the proposed dredging or trenching because the contaminant loads in the sediments in the barge dock area recently were shown to be very low (EA Engineering 2007).

5.1.2 Pile Driving

Pile driving would be used in three project areas, all involving the installation of the sheet-pile walls. The installation process involves using a vibratory hammer to install the sheet piling and a conventional pile-driving hammer to install the 30-in. soldier piles that are placed on 10-ft centers to support the sheet piling. The principal impact from this process is the generation of noise at levels that may be harmful to fish and turtles.

Pile driving noise may affect fish and turtles by causing temporary hearing loss, auditory tissue damage (generally sensory hair cells of the ear), and non-auditory tissue damage (UniStar 2008b). Two criteria, both measured at a standard distance of 10 m (32.8 ft) from the pile-driving activity, are used to estimate the sound and vibration levels from pile driving that would injure fish. The peak sound-pressure level (peak pressure or peak), measured as decibels (dB) relative to reference level of one micro Pascal (dB re 1 μPa_{peak}), is the maximum excursion of pressure associated with the sound (Popper et al. 2006). Peak pressure determines the likelihood that the swim bladder and ear would be exposed to extreme mechanical stress (Popper et al. 2006). The sound exposure level (SEL), measured as dB re 1 μPa2•s, is the constant sound level of 1-second duration that would contain the same acoustic energy as the original sound.

The interim criteria (Popper et al. 2006) specified a peak level of 206 dB and a cumulative SEL level of 187 dB for fish weighing 2 gm and heavier, or a cumulative SEL of 183 dB for fish lighter than 2 gm. The noise levels for the pile driving conducted during the proposed Unit 3 construction were estimated by applying compilations of measurements of noise and vibration impacts associated with various methods of pile driving, types of materials, and water depth. The estimated peak and cumulative SEL values for driving 24- to 36-in. steel piles with a conventional pile-driving hammer in about 5-m (16.4-ft) water depth are about 203 to 208 dB and 177 to 180 dB, respectively. These values suggest that driving 30-in. steel piles with conventional hammers at the Calvert Cliffs site may produce sound impacts that approach or exceed the peak pressure guidance criterion of 206 dB, but would not likely exceed the minimum SEL criterion of 183 dB for fish lighter than 2 gm. Sheet-pile driving produces peak pressures ranging from 175 dB to 180 dB and cumulative SEL values ranging from 160 dB to 165 dB, which are below the respective interim criteria values (UniStar 2008b).

Sounds from pile driving also could affect sea turtles, but the effects are difficult to estimate. There has been little work done to determine the hearing sensitivity of sea turtles at various sound frequencies (Viada et al. 2008), and most of the inference about the potential for sound-related injury is based on studies of turtle anatomy. There is some evidence that sea turtles initially might avoid sounds ranging from about 170 dB to 179 dB, but eventually may become habituated to the noise (Bartol and Musick 2002).

5.1.3 Armoring

The benthic substrate near key underwater structures in the project area would be armored by importing rocks. The largest area, about 4652 ft^2 (0.11 ac), that would receive rock armor is next to the new sheet-pile wall that would be installed to create the intake area for Unit 3. Armoring next to the baffle wall would be added to the Bay bottom as a series of four overlying layers, ranging from washed gravel on the bottom to large quarry rock (average about 2 tons each rock) on the top (UniStar 2009d). The overall thickness of the armoring would vary according to the water depth. Armor would also be placed at the end of the fish-return system, the cooling water discharge diffuser, and the nearshore area of the barge dock. The major effect would be the conversion of the benthic habitat from a soft-bottom infaunal community to a hard-bottom epifaunal community, which eventually should colonize the rocks (Abbe 1987). The loss of soft-bottom habitat may reduce the potential forage area for benthic-feeding fish species and blue crabs. However, the area is not one of high benthic productivity, and the area that would be lost is relatively small.

5.1.4 Vessel Movements

Vessel use during the dredging or the installation of the in-water structures for proposed Unit 3 would affect the aquatic resources of the area, particularly the benthos. The main effects from using vessels would include turbulence from propellers (prop wash), anchor cable scraping across the Bay bottom, and accidental spill of materials overboard. Vessels would be used during the installation of the cooling water discharge pipeline, during the offloading of materials from barges, and probably during the installation of the sheet-pile wall at the new intake area. The primary occurrence of vessels would be during the operation of the barge dock, which is expected to last about five years. The proposed barge docking procedures would minimize the potential impacts from prop wash (UniStar 2008b). Moving vessels could strike sea turtles. Vessel operations during construction are expected to cause short-term, localized impacts to the aquatic resources at the Calvert Cliffs site. These impacts are not expected to affect the protected species in the area of the site or the region along this coast of the Chesapeake Bay.

5.2 General Operational Impacts

For protected species in Chesapeake Bay, the primary concerns related to water intake and consumption are the impacts related to the relative amount of water drawn from the cooling water source, in this case the Chesapeake Bay, and the potential for organisms to be (1) entrapped within the wedge-shaped pool or common forebay; (2) impinged on the trash racks at the intake pipe openings, CWS intake, and UHS intake; (3) impinged on the travelling screens at the CWS and UHS intakes; and (4) entrainment into the cooling systems via CWS and/or UHS intakes. The intake system design for Unit 3 includes a fish-return system located at the CWS intake's travelling screens in the common forebay but not at the UHS intake or at the intake pipe openings in the wedge-shaped pool.

UniStar stated that a closed-cycle, recirculating, wet cooling system with a cooling tower would be used for Unit 3 (UniStar 2009a). The intake system for Unit 3 would incorporate protection measures that may reduce entrainment and impingement. The estimated maximum intake volume of 47,383 gpm for Unit 3 would not exceed the EPA 1-percent water column criterion (UniStar 2009a). Unit 3 would have a fish-return system similar to that used at existing CCNPP Units 1 and 2. Moreover, the through-screen flow velocity would be less than 0.5 ft/sec (0.15 m/sec) under the worst case scenario of minimum Chesapeake Bay level with highest makeup demand flow (UniStar 2009a).

5.2.1 Entrainment

The entrainment of organisms within the cooling water system at CCNPP Units 1 and 2 was studied from 1974 through 1980 (UniStar 2008a) and from March 2006 to September 2007 (UniStar 2008c). The latter study included day and night sampling. Additional ichthyoplankton samples were collected just outside the existing baffle wall separating the intake area from the open waters of the Bay from April to December 2006, which allowed comparison of entrained organisms with natural populations in the Bay.

No shortnose sturgeon life stages were entrained during either study nor were any caught in the samples collected outside the baffle wall in the 2006–2007 study. Because sturgeon eggs and larvae do not move from rivers into estuaries, no shortnose sturgeon life stages near the Calvert Cliffs site are small enough to be entrained by the proposed new unit. Likewise, no turtle life stage is small enough to be subject to entrainment at the proposed new unit.

5.2.2 Impingement and Entrapment

Impingement sampling was conducted at CCNPP Units 1 and 2 from 1975 through 1995 (Ringger 2000). Ringger (2000) did not report any shortnose sturgeon or sea turtle impingement. An unidentified species of sea turtle was impinged at the trash racks at the existing CCNPP facility in June 2001 (NRC 2001). However, blue crabs (*Callinectes sapidus*), prey for some sea turtles, were impinged, with the greatest occurrence generally in spring, summer, or fall. Blue crab impingement generally was lower after the mid 1980s than before. The apparent difference in impingement rates before and after the mid 1980s may be related to several operational and structural modifications to the intake and fish-return systems that were made from about 1984 to 1986, partly in response to severe impingement events that occurred in 1983 (Ringger 2000).

The numbers of organisms impinged were normalized to intake cooling water withdrawal flow at CCNPP Units 1 and 2 and scaled to Unit 3 flow. The combined flow of CCNPP Units 1 and 2 is about 5332 cfs, whereas the projected intake flow for proposed Unit 3 is about 96.8 cfs. Because the projected intake flow volume for Unit 3 is about 1.82 percent of that at CCNPP Units 1 and 2 and assuming that the relationship between flows is linear, the projected impingement and mortality rates at Unit 3 are correspondingly small. The average annual blue crab impingement rate predicted for Unit 3 is 11,403 crabs. However, because of the high survival rate (99.5 percent) following impingement (Ringger 2000), the estimated average annual impingement mortality rate at Unit 3 is 62 crabs. The impingement mortality estimates for blue crabs probably are somewhat conservative because the entire 21-year data set was used for the calculations regardless of apparently reduced impingement after modifications made in the mid-1980s. Also, the Unit 3 intake approach velocities within the forebay would be less than 0.5 ft/sec (0.15 m/sec), which would allow more crabs to avoid impingement. Unit 3 would incorporate a fish-return system in the common CWS/UHS forebay that may help increase survival following impingement by returning crabs beneath the surface of the Bay.

Water enters the wedge-shaped pool from the intake embayment for Units 1 and 2 by passing under a sheet-pile wall. Some protected species, particularly turtles, could enter the wedge-shaped pool and become trapped there. Water from the wedge-shaped pool passes through fixed trash racks into the two intake pipes that carry water to a common forebay that would supply water to the CWS and UHS (Section 3.1 of this BA). Protected species could become impinged on the trash racks and would require rescue because there is no method for removing organisms from the racks. Because traveling screens and the fish-return system would be located off the common forebay, organisms able to pass through the trash racks covering the intake pipe openings would enter the common forebay and could become trapped there. There would be no mechanism to remove entrapped organisms from the common forebay other than the fish-return system associated with the CWS pumps (UniStar 2009c). Some blue crabs could become entrapped, but the number is not possible to estimate confidently. It is unlikely that any of the protected species that could occur near Calvert Cliffs would be small enough to fit through the trash racks. Therefore, entrapment in the common forebay is not expected to be a dominant concern for shortnose sturgeon and sea turtles.

5.2.3 Aquatic Thermal Impacts

The effluent discharge from Unit 3 would be directly into the Chesapeake Bay. CORMIX modeling showed that the expected discharge plume from proposed Unit 3 would be small and would not interact with the plume from Units 1 and 2. Abbe (1987) evaluated the potential effects of the thermal discharge from CCNPP Units 1 and 2 and concluded that the thermal discharge from CCNPP Units 1 and 2 had no important adverse impacts on fish or key invertebrate species, such as blue crabs. The Maryland Power Plant Research Program (PPRP) concluded that the effects of thermal discharges from the power plants into Chesapeake Bay habitats were localized and not considered significant (MDNR PPRP 2008). The waste heat from the Unit 3 discharge would dissipate quickly because of the small size of the thermal plume and would not affect protected species.

Cold shock occurs when aquatic organisms that have been acclimated to warm water, such as fish in a power plant's discharge canal, are exposed to a sudden temperature decrease. This sometimes occurs when power plants shut down suddenly in winter. Abbe (1987) concluded that the potential for cold shock associated with the discharge plume from CCNPP Units 1 and 2 probably was not significant because the relatively small area of warmer water did not attract many fish during the winter. Cold shock is also unlikely to affect shortnose sturgeons at the Unit 3 site because the discharge volume is small in comparison to the volume of the Bay (UniStar 2009a). Sea turtles would not be exposed to cold shock because they do not live in the Bay during the winter.

5.2.4 Chemical Impacts

The UniStar application indicates that chemicals, such as anti-scaling compounds, corrosion inhibitors, and biocides, would be added to the CWS and the essential service water system (ESWS) (UniStar 2009a). Biofouling in the CWS would be controlled by the limited application of chlorine or bromine (UniStar 2009a). The CWS would provide about 90 percent of the effluent discharged to the Chesapeake Bay, with the desalinization plant contributing another 9 percent (UniStar 2008a). UniStar provided estimated concentrations of various constituents in the waste stream based on design data. To illustrate the expected low concentrations of these constituents, UniStar compared expected concentrations of five metal contaminants (arsenic, chromium, copper, nickel, and zinc) to aquatic life chronic salt water limits specified by the State of Maryland (COMAR 2008). Predicted concentrations within the discharge from proposed Unit 3 would be substantially less than the State aquatic life limits (UniStar 2008a). UniStar would calculate more precise estimates of constituent concentrations in the effluent as part of the NPDES permitting process for Unit 3. The NRC determined that the effluent discharge from CCNPP Units 1 and 2 would not significantly change the salinity gradients near the Calvert Cliffs site (NRC 2000). The addition of the relatively small discharge volume from Unit 3 would not be expected to alter this determination.

UniStar expects that the NPDES permit for Unit 3 would require bioassay testing, as does the permit for CCNPP Units 1 and 2, to assess the potential toxicity of the discharge and provide for corrective action if necessary. To date, the bioassay testing performed for CCNPP Units 1 and 2 has not indicated any toxicity to test organisms (UniStar 2009a). Therefore, the plume from proposed Unit 3 is not likely to be toxic to sturgeons or sea turtles.

5.2.5 Physical Impacts from Discharge

The NRC determined that the effluent discharge from CCNPP Units 1 and 2 would not significantly change the current patterns near the Calvert Cliffs site (NRC 2000). The addition of the relatively small discharge volume from Unit 3 would not be expected to alter this determination. The primary physical and ecological impacts from the CCNPP Units 1 and 2 cooling water discharge are from sediment scour near the high-velocity discharge ports. The bottom scour associated with the discharge from CCNPP Units 1 and 2 was about 42 ac (UniStar 2008a). The sand substrate present prior to the operation of CCNPP Units 1 and 2 was scoured by the discharge, leaving a hard clay substrate. The benthic community changed from one characterized by burrowing soft-bottom organisms to one dominated by fouling organisms (Abbe 1987; UniStar 2008a).

The physical impacts associated with Unit 3 cooling water discharge would be limited to sediment scour of a small area. The area of Bay bottom that may be scoured would be minimized by the placement of riprap for about 10 ft on either side of the diffuser (UniStar 2008b). The potential scour area was estimated to be 13,256 ft^2 (0.3 ac) (UniStar 2008a). If the sediment becomes scoured near the discharge for Unit 3, a change in benthic habitat that would be similar to, but much less extensive than, that observed at the discharge for Units 1 and 2 would occur. This scouring of the bottom would not adversely affect the protected species in the area.

5.3 Effects of the Proposed Actions on Federally Protected Species

This section describes the potential impacts to Federally proposed, threatened, or endangered aquatic species resulting from the construction and operation of the new unit at the Calvert Cliffs site.

5.3.1 Shortnose Sturgeon

The primary activities associated with the construction of a new unit at the Calvert Cliffs site that could affect the shortnose sturgeon are the installation of the intake and discharge systems. Construction of the intake would include installation of a sheet-pile baffle wall that would generate short-term noise levels sufficient to affect many fish, although the sensitivity of shortnose sturgeon to noise is not known. Baffle wall installation would occur over a relatively short time period, and sturgeons would be expected to avoid the area.

Dredging to refurbish the barge dock area or to install the discharge pipeline and fish-return system could affect sturgeons by increasing the sediment loads in the water column. UniStar would use methods, such as turbidity curtains, to minimize this sedimentation. Because the area near the construction activities is not highly productive, disruption of the benthic habitats would not indirectly affect shortnose sturgeons by altering a food resource.

The operational factor that poses the most risk to shortnose sturgeon is the potential for impingement on the trash racks that guard the intake pipelines. Despite the occurrence of many fish species in the impingement samples collected at CCNPP Units 1 and 2 from 1975 to 1995, no shortnose sturgeon were found (Ringger 2000). The benthic prey of juvenile and adult shortnose sturgeons likely would not be impinged. The small numbers of shortnose sturgeon in the Chesapeake Bay and their occurrence primarily in the upper Bay, coupled with the low intake velocity proposed for the new unit at Calvert Cliffs site, substantially lower the likelihood that impingement would occur. It is not likely that benthic-dwelling sturgeons would become entrapped for extended time periods within the wedge-shaped intake area for Unit 3 because the low current velocities through the intake embayment would not prevent sturgeons from swimming out of the area. Sturgeon eggs and larvae do not occur near the Calvert Cliffs site, and sturgeons that may occur there would be too large to pass through the trash racks and enter the common forebay. Therefore, shortnose sturgeons would not be entrained into the CWS or entrapped within the common forebay.

5.3.2 Sea Turtles

The construction and operation of a new unit at the Calvert Cliffs site would be most likely to affect the loggerhead and Kemp's Ridley turtles. The green and leatherback turtles are relatively rare in the Bay, typically occurring in the lower Bay, and the likelihood that populations or individuals of either species would be significantly affected by the new unit is highly unlikely.

The primary construction activities that would affect sea turtles entering the Bay are similar to those that would affect shortnose sturgeons. Increased vessel activity could affect sea turtles in the area, but this could be minimized by careful vessel operations. The potential effects of pile driving noise during the installation of the baffle wall on turtles are difficult to evaluate. There are indications that turtles would initially avoid the noise, but eventually could become habituated to it. The relatively short duration proposed for this activity would help reduce the potential that turtles would become habituated. Increased sedimentation during dredging could affect turtles, but UniStar proposes to uses methods to reduce the spread of water column sediment.

As with shortnose sturgeon, the principal causes of adverse impact to sea turtles are impingement on the intake pipe trash racks and entrapment in the wedge-shaped pool. Smaller turtles could become trapped by the trash racks because their heads likely would fit between the trash rack bars. Because of the relative rarity of sea turtles in the part of the Bay near the Calvert Cliffs site, and the proposed low velocities at the intake system, the likelihood of sea turtle impingement is low. A search of the event logs maintained by the NRC revealed the occurrence of sea turtle impingement at the existing trash racks for operating Units 1 and 2 (NRC 2001). The impinged species was not identified. Impingement could indirectly affect Kemp's ridley turtles. Historical records showed large numbers of blue crabs, one of the major food items of Kemp's ridley turtles, as being impinged by CCNPP Units 1 and 2 (Section 5.2.2), but the new Unit 3 would not add significantly to that total because of the small volume of water required for the cooling system. The potential effect on the turtles is lessened by the high rate at which the crabs survive impingement. Sea turtles could become entrapped within the wedge-shaped pool by swimming under the sheet-pile wall separating the embayment for CCNPP Units 1 and 2 from the Unit 3 wedge-shaped pool where turtles could surface and be unable to find the path back under the wall to the embayment for Units 1 and 2 and then also back to the Bay. No information could be found about such occurrences of turtle entrapment by the similarly designed baffle wall for CCNPP Units 1 and 2. Turtles would likely be too large to pass through the trash racks at the intake pipe openings and enter the common forebay. Therefore, impingement on the trash racks at the CWS and UHS intake structures would not be likely.

6.0 Cumulative Effects on Federally Protected Species

The NRC and the Corps review team considered potential cumulative effects on Federally protected species in conjunction with building and operating a new nuclear unit at the Calvert Cliffs site. For this analysis, past and present actions create the existing baseline conditions, and cumulative effects include the effects of future State, tribal, local, and private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future Federal actions that are not related to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the ESA (FWS and NMFS 1998). The future is defined as the start of construction of the proposed Unit 3 until the conclusion of decommissioning. The action area for this evaluation is the Calvert Cliffs site and the mesohaline (salinity ranges from about 5 to 19 parts per thousand) western portion of the Chesapeake Bay. The extent of the mesohaline zone in the Chesapeake Bay varies seasonally, but, at its maximum, includes the western Bay shore from near the mouth of the Rappahannock River to Baltimore (MDNR PPRP 2008; CBP 2009).

Two future non-Federal projects were identified within the action area. Reinforcing an existing pier at the Cove Point Liquefied Natural Gas (LNG) terminal, about 3.5 mi southeast of the Calvert Cliffs site, would involve the installing 108-in.-diameter tubular steel monopile mooring dolphins, reinforcing existing and installing new breasting dolphins, installing walkways, and dredging about 30 ac of Bay bottom around the pier to a depth of about −45.0 ft mean low water (USCG and USACE 2009). Suitable dredged material would be placed in a stone-reinforced area along 2513 ft of shoreline and extending an average of 225 ft channelward to create a tidal marsh. The construction and operation of the proposed Unit 3 at the Calvert Cliffs site would not interact with reinforcing the pier at the Cove Point terminal because the effects of both projects would be relatively localized. Both are in areas of the Bay that could be avoided by protected species. Operation of the terminal would not be likely to adversely affect protected species (USCG and USACE 2009).

Building and operating a new nuclear reactor on the Calvert Cliffs site could interact with a part of the proposed Mid-Atlantic Power Pathway (MAPP) project, which proposes to build a 500-kV transmission line from Possum Point, Virginia, to Salem, New Jersey (MAPP 2009a). The second part of the MAPP project would involve building an underwater crossing through the Chesapeake Bay extending from Calvert Cliffs to the Maryland eastern shore. The route could include broadband fiber optic cables (PHI 2009). Details of this part of the project are not yet available, but the installation of underwater cables could involve horizontal directional drilling from the shore into the Bay and some type of trenching to install the cable within the Bay. The schedule suggests that the crossing under the Bay is expected to be completed in 2014 (MAPP 2009b). Both projects could affect benthic habitats in the same nearshore area off the Calvert Cliffs site but would not significantly affect protected species occurring in the area.

CCNPP Units 1 and 2 will continue to operate during the construction and operation of proposed Unit 3. The two units have requested power uprates that will increase the generating capacity of each unit by about 1.38 percent (NRC 2009). The uprate was approved in December 2009 for Unit 2 and a decision is expected by the end of summer 2010 for Unit 1 (NRC 2009). The uprates would likely result in a small increase in water withdrawn from the Bay and a small increase in the temperature of water discharged to the Bay. Neither increase would be expected to significantly add to the present effects of Units 1 and 2 on the Bay, nor the combined effects of Units 1, 2, and 3.

The Calvert Cliffs site operations, other anthropogenic stressors, and climatic events could combine to adversely affect the aquatic populations of the Chesapeake Bay. Commercial and recreational fishing pressure has significantly affected aquatic resources in the Bay causing population declines for several species (Greiner and Vogt 2009). Shortnose sturgeon populations declined because of direct fishing and because the species was often bycatch for other fisheries. Sea turtles in Chesapeake Bay have been affected by entrapment within pound nets. The operation of proposed Unit 3 at the Calvert Cliffs site could also contribute to population declines by impinging or entrapping protected species, but such events are anticipated to occur rarely, if at all. Sturgeons have not been impinged at CCNPP Units 1 and 2, and there is only one documented record of turtle (unidentified) impingement.

A significant issue facing the Chesapeake Bay is global climate change. The buildup of greenhouse gas emissions that occurred in the 20th century has assured that some climate change will occur within the 21st century, even without increasing the current rates of emissions (Teng et al. 2006). The projected climate changes are predicted to affect the Chesapeake Bay primarily through increasing sea level, air and water temperatures, and changes in precipitation (Jasinski and Claggett 2009). Increased water acidity, which is a looming issue in some ocean habitats (Doney et al. 2009), is considered a less important factor for the Chesapeake Bay at present (Jasinski and Claggett 2009). Wu et al. (2009) projected that the sea level at Solomons Island, about 7.5 mi south of CCNPP, is expected to rise by about 22 to 24 in. by the end of the 21st century. However, the estimate did not consider that the melting of the West Antarctic Ice Sheet could cause regional differences in sea level rise, which implies that the projection may have underestimated the rise in sea level in the Chesapeake Bay area by as much as one-third (Mitrovica et al. 2009). Najjar et al. (2009) projected that air temperatures in the Chesapeake Bay region could rise by about 5°F to 12°F by the year 2100. Because surface-water temperature is roughly related to air temperature, a similar increase in water temperature could be expected (Wood et al. 2002). Changes in rainfall are difficult to predict and model results often disagree. Most models predict, with considerable variability, that precipitation in winter and spring in the latter part of the 21st century could change an average of 3 percent over current levels (Najjar et al. 2009). One of the effects of increased precipitation is a reduction in salinity, particularly in the winter and spring (Jasinski and Claggett 2009).

The interaction of the operation of the proposed Unit 3 and the predicted rise in Bay water level is difficult to assess, but it is not likely that the plant's operations would add significantly to the potential impacts of sea-level rise (e.g., increased shoreline erosion). Similarly, the small sizes of the discharge plumes from Units 1 and 2 and proposed Unit 3 compared to the volume of water in the Chesapeake Bay suggests that the thermal discharges from all three units would not add importantly to the thermal regime in the Bay. Salinity in the Bay is predominantly related to flow from the Susquehanna River (Gibson and Najjar 2000), and the comparatively small discharges from all three units would not contribute to significant salinity changes in the Bay.

The review team concludes that the construction and operation of Unit 3 on the Calvert Cliffs site would not significantly add to the cumulative effects of the identified future projects or to the existing or future anthropogenic stresses on the protected aquatic resources in the Chesapeake Bay.

7.0 Conclusions

This BA has evaluated the potential impacts of the construction and operation of the proposed Unit 3 at the Calvert Cliffs site on shortnose sturgeon and sea turtles near the site. The known distributions and records of those species and the potential ecological impacts of the construction and operation to the species, their habitat, and their prey have been considered.

Based on this review, the NRC and the Corps conclude that the overall effects of the construction and operation of the proposed new unit at the Calvert Cliffs site would not likely adversely affect or jeopardize the continued existence of the shortnose sturgeon or loggerhead, Kemp's ridley, green, or leatherback turtles.

8.0 References

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Essential Fish Habitat Assessment

National Marine Fisheries Service

Calvert Cliffs Nuclear Power Plant Unit 3
Calvert County, Maryland

U.S. Nuclear Regulatory Commission Combined License Application
Docket No. 52-016

U.S. Army Corps of Engineers Permit Application
Permit Application No. NAB-2007-08123-M05 (Calvert Cliffs 3 Nuclear Project, LLC/UniStar Nuclear Operating Services, LLC)

April 2010

U.S. Nuclear Regulatory Commission
Rockville, Maryland

U.S. Army Corps of Engineers
Baltimore District

1.0 Introduction

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801 et seq.), as amended (MSFCMA), recognizes that habitat is important for the protection of healthy fisheries and established procedures to identify, conserve, and enhance essential fish habitat (EFH) for Federally managed fish and shellfish species (NEFMC 1998). EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. 1801 *et seq*.; NMFS 2004). Federal agencies must consult with the Secretary of Commerce on all actions, or proposed actions, authorized, funded, or undertaken by the agency that may adversely affect EFH (NMFS 2004).

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (applicant or UniStar) for a combined license (COL) to construct and operate a new nuclear reactor with a design-rated gross electrical output of approximately 1710 megawatts-electric (MW(e)) on the Calvert Cliffs site. The U.S. Army Corps of Engineers (USACE or Corps) is reviewing an application from UniStar for a Department of the Army (DA) Individual Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 403 *et seq.*) (Rivers and Harbor Act) and Section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) to perform site preparation and construction activities for the proposed new unit at the Calvert Cliffs site. Currently, there are two operating nuclear reactors on the site, Calvert Cliffs Nuclear Power Plant (CCNPP) Units 1 and 2. The proposed project is to construct and operate a new unit, Unit 3, which would be located adjacent to CCNPP Units 1 and 2, to provide for additional baseload electrical generating capacity to meet the growing demand for electricity in the State of Maryland. The site is located about 60 mi south of Baltimore and 40 mi southeast of Washington, D.C. (Figure 1). It is about 10.5 mi southeast of Prince Frederick, Maryland, and 7.5 mi north of Solomons, Maryland.

Pursuant to National Environmental Policy Act of 1969, as amended (NEPA), the NRC and the Corps are cooperating agencies with the NRC being the lead agency, and they are preparing an environmental impact statement (EIS) as part of the agencies’ review of the COL and DA permit applications. The Corps is cooperating with the NRC to ensure that the information presented in the EIS is adequate to fulfill the requirements of Corps regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the substantive environmental criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the United States; and the Corps’ public interest review process. As required by Title 10 of the Code of Federal Regulations (CFR) Part 51.26, the NRC has published in the *Federal Register* a Notice of Intent (73 FR 8719) to prepare an EIS and to conduct scoping. The final EIS will be issued after considering public comments on the draft EIS. The impact analysis in the EIS includes an assessment of the potential environmental impacts of the construction and operation of a new nuclear power unit at the Calvert Cliffs site and along the associated transmission line corridors, including potential impacts to the threatened and endangered species. If issued, the COL would authorize UniStar to construct and operate the new unit. The Corps will finalize its Record of Decision after issuance of the final EIS.

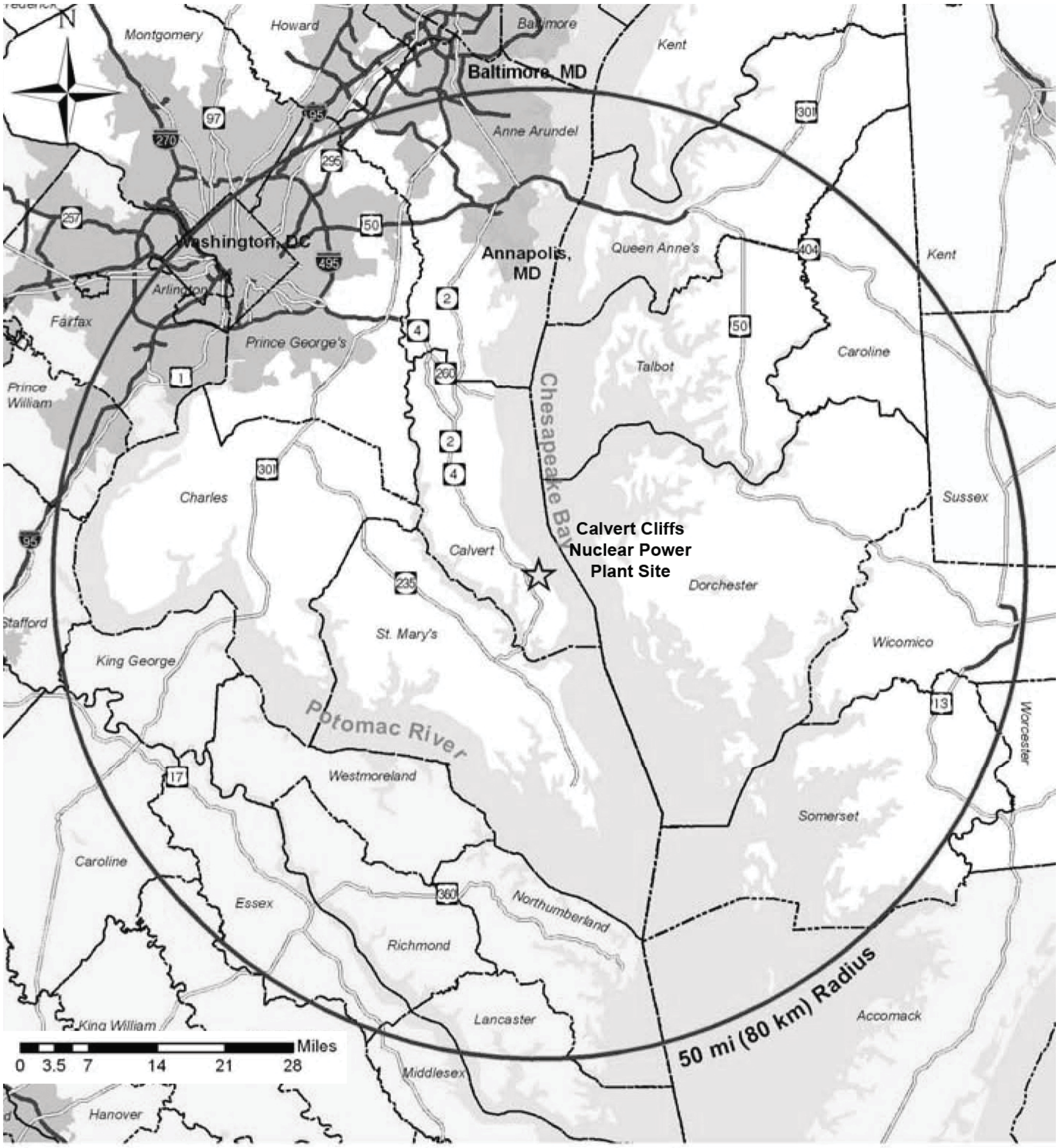

Figure 1. Location of the Calvert Cliffs Site, 50-mi Region (UniStar 2009a)

The NRC and the Corps have prepared this EFH assessment to support their joint consultation with the National Marine Fisheries Service (NMFS) in accordance with the MSFCMA. The proposed action may adversely affect EFH in the project area. The proposed project has the potential to cause temporary and permanent adverse impacts to spawning, nursery, forage, and shelter activities and habitats. The NRC and Corps review team considered the designated EFH in the Chesapeake Bay, and this EFH assessment examines the potential impacts of the proposed actions on nine species: black sea bass (*Centropristis striata*), bluefish (*Pomatomus saltatrix*), butterfish (*Peprilus triacanthus*), clearnose skate (*Raja eglanteria*), little skate

(*Leucoraja erinacea*), red drum (*Sciaenops ocellatus*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), and winter skate (*Leucoraja ocellata*). These species are described further in Section 4.0, and the impacts to them and their EFH, including their prey, are discussed in Section 5.0 of this EFH assessment.

2.0 Calvert Cliffs Site Description

The Calvert Cliffs site is located on the Chesapeake Bay about 60 mi south of Baltimore; 40 mi southeast of Washington, D.C.; 10.5 mi southeast of Prince Frederick, Maryland; and 7.5 mi north of Solomons, Maryland (Figure 1). The site comprises about 2070 ac adjacent to Chesapeake Bay in an unincorporated area of Calvert County, Maryland. The NRC has licensed two existing nuclear generating units at the Calvert Cliffs site, CCNPP Units 1 and 2, which have a combined net electric generating capacity of approximately 1700-1780 MW(e). Units 1 and 2 use once-through cooling systems and obtain water from the Chesapeake Bay. The combined flow of CCNPP Units 1 and 2 intakes is about 5332 cubic feet per second (cfs). There are two shoreline water intake structures for the existing units that share a common forebay, and each unit has its own fish-return system. The two existing units also share a discharge pipe that enters the Chesapeake Bay north of the intake structure. South of the intake structure is a barge slip for offloading heavy replacement components. The barge slip has been used several times since 2001 to receive replacement steam generators, transformers, and vessel reactor heads, and it is likely that there would be occasional use of the facility in the future for continued operation of CCNPP Units 1 and 2, which could require future maintenance dredging (UniStar 2009b). Both existing units would remain and continue to operate and would not be affected by the proposed action.

There is no submerged aquatic vegetation (SAV) within the proposed project area or near the Calvert Cliffs site (EA Engineering 2007b), and there are no habitat areas of particular concern (HAPC) within the proposed project area or near the Calvert Cliffs site. The project site is a high-energy wave area with about a 6-mi fetch across the Chesapeake Bay. The project area waterway is used throughout the year for recreational and commercial boating, fishing activities, and commercial shipping. The shoreline at the proposed project site is protected by stone revetment and bulkheads and includes some natural beach shoreline along eroding 70-ft-high cliffs.

2.1 Chesapeake Bay Conditions

The Chesapeake Bay is one of the largest estuary systems in the world and currently supplies cooling water for CCNPP Units 1 and 2. The Bay is very productive and is an important part of the cultural and economic fabric of the area. Much of the Chesapeake Bay, including the reach that encompasses Calvert County, is considered impaired, primarily because of low dissolved oxygen (DO) and increased nutrients and sedimentation from human activities. The Chesapeake Bay Program (CBP) oversees monitoring at selected locations throughout the Bay and has developed average seasonal conditions from 1985 to 2008. One station, known as CB4.4, is in the middle of the Bay, east of the Calvert Cliffs site. The average monthly surface water temperature at this location has ranged from about 38°F (February) to about 81°F (July, August) (MDNR 2009a). The average monthly surface water salinity at station CB4.4 is typically lowest in late spring, ranging from about 10 to 11 ppt (April through June), and highest in late fall, ranging from about 15 to 16 ppt (September through November) (MDNR 2009b). Average monthly DO concentrations at station CB4.4 have ranged from about 0.3–0.4 mg/L (July; August) to 9.0–10.0 mg/L (January through March) (MDNR 2009c). Average June through September DO concentrations have been hypoxic (less than 2.0 mg/L) (Wicks et al. 2007). The minimum DO concentrations during those months occasionally may be anoxic (less than 0.2 mg/L).

Water depths near the Calvert Cliffs site are generally less than 30 ft (EA Engineering 2007a). Sediments near the CCNPP barge dock area primarily are composed of sand (94 to 96 percent) and gravel (2 to 5 percent) with a small percentage of clay (EA Engineering 2007a). Total organic carbon (TOC) in the sediments ranged from about 2.4 to 3.1 percent. The sediment type sampled near the barge area was typical for the general region. The two stations located just north of the Calvert Cliffs site that have been sampled under the Maryland Department of Natural Resources (Maryland DNR) water quality monitoring program are also very sandy with a very small silt/clay fraction (Llansó et al. 2007). However, the TOC content of the CCNPP sediments was much higher than that of the two Maryland DNR stations (<1 percent each). Most organic compounds analyzed in the CCNPP sediments were reported as not detected (EA Engineering 2007a). The few organic compounds that were detected in the sediments occurred at concentrations less than the respective method detection limits. Of the seven metal compounds analyzed, six occurred at levels greater than the method detection limits, but all were substantially less than their respective threshold effects levels (the concentration below which effects are expected to be rare) (Buchman 2008).

The benthic infaunal community found near the barge dock was generally sparse and composed of relatively few taxa. Infaunal abundance varied from 32 to 85 individuals per 0.05 m^2 samples (about 640 to 1700 individuals per m^2) (EA Engineering 2007a). These samples contained from 9 to 13 species. The abundances of infauna inhabiting the CCNPP sediments were generally similar to those reported for the two Maryland DNR stations sampled in summer 2006 (Llansó et al. 2007). However, species numbers at the CCNPP stations were slightly greater than those for the Maryland DNR stations. The infaunal community at the two CCNPP stations near the site of the proposed cooling water discharge pipe primarily was composed of the small clam *Gemma gemma* and polychaete worms, such as *Streblospio benedicti* and *Glycinde solitaria*. The small clam was not found at the station south of the barge dock near the area proposed to be dredged. The infaunal community there consisted predominantly of polychaete worms, such as *S. benedicti*. The general infaunal community composition at the CCNPP stations was similar to those at the two Maryland DNR stations. *Gemma gemma* was predominant at both Maryland DNR stations in summer 2006. Polychaete worms, such as *S. benedicti*, were common. Another small clam, *Mulinia lateralis*, was common at the Maryland DNR stations, but was not common at the CCNPP stations.

3.0 Proposed Federal Actions

The proposed Federal actions are (1) issuance of a COL for the construction and operation of a new nuclear reactor at the Calvert Cliffs site pursuant to 10 CFR 52.97 and (2) a decision regarding a DA Individual Permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of "construction" to those activities that fall within its regulatory authority, as written in 10 CFR 51.4. Many of the activities required to construct a nuclear power plant are not part of the NRC action to license the plant. Activities associated with building the plant that are not within the purview of the NRC action are grouped under the term "preconstruction." Preconstruction activities include clearing and grading, excavating, erection of support buildings and transmission lines, and other associated activities. These preconstruction activities may take place before the application for a COL is submitted, during the staff's review of a COL application, or after a COL is granted. Although preconstruction activities are outside the NRC's regulatory authority, many of them are within the regulatory authority of local, State, or other Federal agencies. This EFH assessment does not differentiate between construction and preconstruction, and they are being discussed together as construction activities.

The Corps action is the decision whether to issue a permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for proposed structures in and under navigable waters and the discharge of dredged, excavated, and/or fill material into waters of the United States, including jurisdictional wetlands.

Prerequisites to construction activities include, but are not limited to, documentation of existing site conditions within the Calvert Cliffs site and acquisition of the necessary permits (e.g., COL, local building permits, a National Pollutant Discharge Elimination System permit, a Clean Water Act Section 404 permit, a General Stormwater permit, and other State and local permits). After these prerequisites are completed, planned construction activities could proceed and would include all or some of all the activities pursuant to 10 CFR 50.10(a)(1), although no separate operating license would be required. Briefly, the construction and operation activities that could affect Federally managed estuarine and marine species based on habitat affinities and life-history characteristics and the nature and spatial and temporal considerations of the activity are:

Construction

- Dredging and modification of the existing barge slip, including a sheet-pile wall and a stone apron, on the Chesapeake Bay shoreline
- Installation of the cooling water intake system including new sheet pile, armor removal, armor installation, dredging, and the fish-return system
- Installation of the cooling water discharge system
- Increased vessel traffic associated with the construction activities.

Operation

- Impingement, entrainment, and entrapment associated with the cooling water intake system
- Discharge plume from the cooling water system (thermal, chemical, and physical effects)
- Maintenance dredging of barge slip.

The construction footprint for the proposed Unit 3 would cover about 460 ac, including about 175 ac of previously disturbed ground. UniStar has proposed to build and operate an AREVA NP, Inc., U.S. EPR design pressurized water reactor steam electric system, which is rated at 4590 MW(t) with a net electrical output of 1562 MW(e). Unit 3 would require cooling water intake and fish-return facilities that are separate from CCNPP Units 1 and 2 and would also have a separate plant access road and protected area. The proposed circulating water supply system (CWS) would be closed-cycle using a mechanical-draft cooling tower with plume abatement (UniStar 2009a). The proposed project would affect about 5.7 ac (248,000 ft^2) of tidal open waters and would affect intertidal, subtidal, and water-column zones within the proposed project area. The existing waterway depths within the proposed work area range from about 0.0 to −16.0 ft mean low water.

The existing transmission system for CCNPP Units 1 and 2, which consists of two circuits, would also be used to service the proposed Unit 3. No new transmission corridors would be constructed outside the construction footprint. Operation of the transmission system is not expected to affect Federally managed estuarine or marine species in the Chesapeake Bay.

3.1 Cooling Water Intake System

A 180-ft-long sheet-pile wall, embedded 15 ft into the Bay bottom, would be built to extend from the existing baffle wall for CCNPP Units 1 and 2 to the shoreline south of the present intake forebay to create a 9000-ft^2 (0.21-ac) wedge-shaped pool that would be the intake embayment for the new unit (Figure 2). The wall would be built of steel sheet piling supported by 30-in.-diameter soldier piles placed on 10-ft centers. The new baffle wall would not have an opening that would allow the new wedge-shaped pool to communicate directly with the Bay. Therefore, Unit 3 would share the embayment now used by CCNPP Units 1 and 2. A 50-ft section of shoreline armoring would be removed prior to the wall installation. The construction of the sheet-pile wall would take about 2 months. Once the wall is in place, about 60 ft of shoreline armor within the wedge-shaped pool would be removed, and a temporary sheet-pile wall would be installed upland along the intake water pipe route. The upland sheet-pile wall would extend about 30 ft into the wedge-shaped pool to create a small area that would be dewatered to facilitate dredging of a 30-ft by 30-ft area to a depth of 25 ft. This excavation would house two 60-in.-diameter intake pipes that would extend about 20 ft channelward. The pipes would have trash racks but no screens at their openings. The trash bar spacing is expected to be 3.5 in. from center to center. Debris collected by the trash racks would be collected in a debris basin for cleanout and disposal as solid waste. The expected flow into the Unit 3 intake pipes is

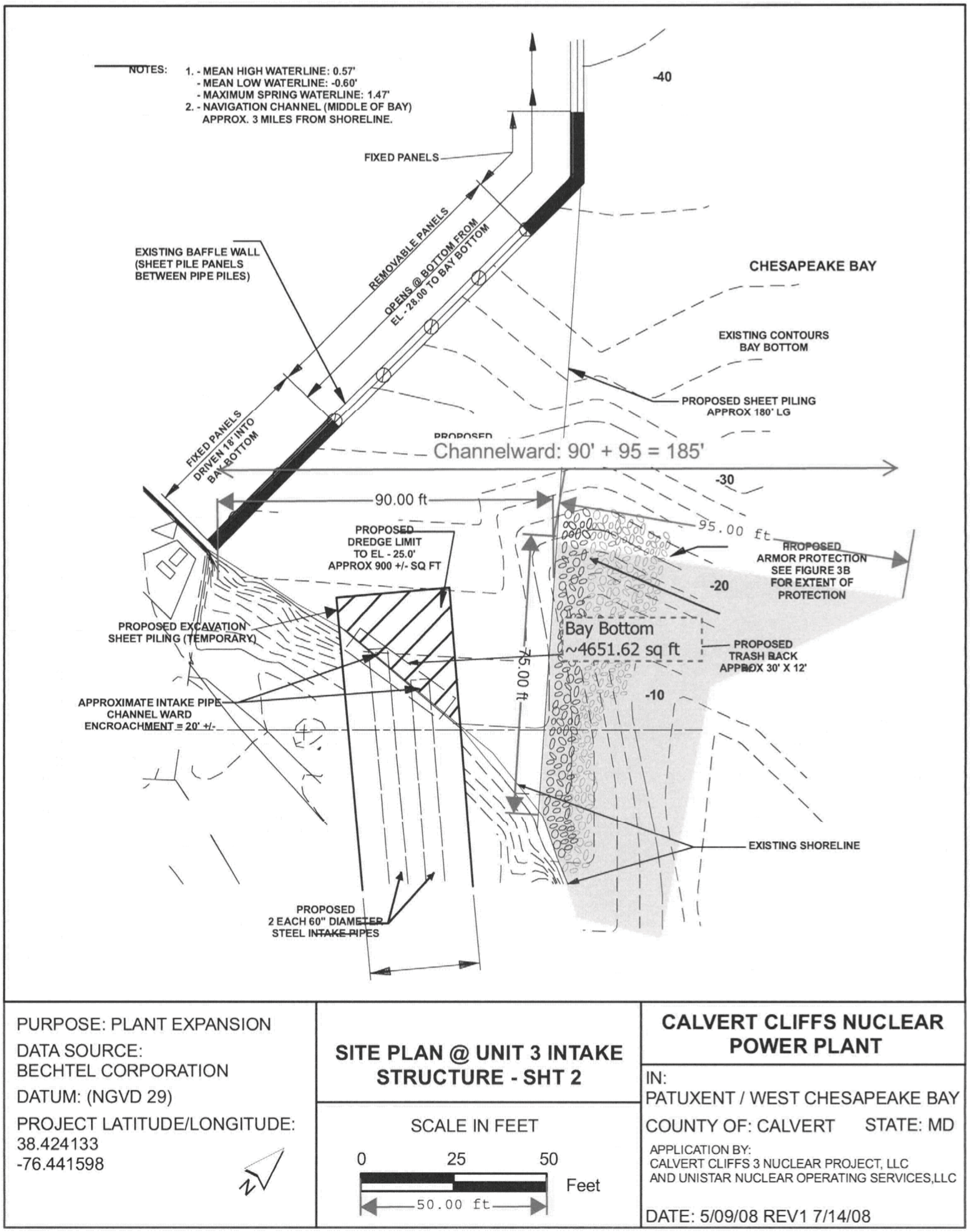

Figure 2. Site Plan at the Unit 3 Intake Structure (UniStar 2009d)

less than 0.5 fps. About 80 ft of the shoreline within the pool would be armored, with the armoring extending about 10 ft from shore. The new sheet-pile wall would be armored by placing riprap on the Bay bottom, extending about 75 ft from the shoreline and about 25 to 95 ft toward the channel (UniStar 2009d). The armoring would be added to the Bay bottom as a series of four overlying layers, ranging from washed gravel on the bottom to large quarry rock (average about 2 tons each rock) on the top (UniStar 2009d). The overall thickness of the armoring would vary according to the water depth. About 4652 ft^2 (0.11 ac) of the Bay bottom would be armored (Figure 2). The temporary sheet-pile wall within the wedge-shaped pool would be removed. The construction of the intake system would take about 4 months.

The two intake pipes would be placed in trenches dug on land and would extend about 500 ft south to the location of common forebay for the Unit 3 CWS and ultimate heat sink (UHS) makeup water intake structures (UniStar 2009a). The common forebay would be 100 ft long by 80 ft wide and would be about 12 ft deep (UniStar 2009a). The Unit 3 CWS makeup water intake structure would be a concrete structure about 78 ft long and 55 ft wide with individual pump bays. Three 50-percent capacity, vertical, wet-pit CWS makeup pumps would provide up to 44,000 gpm of makeup water. The Unit 3 UHS makeup water intake structure would be a concrete structure about 75 ft long and 60 ft wide with individual pump bays. Four 100-percent capacity, vertical, wet-pit UHS water makeup pumps would provide up to 3000 gpm of makeup water. Flow velocities at the CWS and UHS makeup structures would be less than 0.3 fps and less than 0.1 fps, respectively.

For the CWS makeup water intake structure, water would flow from the common forebay through trash racks and two traveling screens and trash racks into a smaller forebay that feeds the three CWS makeup pumps. The traveling screens for each system would be dual-flow screens with a double-entry/center-exit flow pattern. The screen panels would be metallic or plastic mesh with a mesh size of 3/8 in. or smaller (UniStar 2009b). The screens would be mechanically rotated above the water for cleaning with a pressurized water spray. Screen wash water would be supplied by two screen wash pumps. Through-screen flow velocities would be less than 0.5 fps. For the UHS makeup intake structure, water flows from the common forebay directly to each makeup pump after passing through trash racks and a dual-flow screen. The screens for the UHS pumps would not be equipped with a fish-return system (UniStar 2009c).

3.2 Fish-Return System

A fish-return system similar to those for CCNPP Units 1 and 2 would be built (UniStar 2009a) for the CWS pumps. The final design details have not been determined. Organisms would enter the return system at the intake screens for the CWS intake structure located at the common forebay after the organisms traveled through the pipe originating at the shoreline intake about 500 ft north of the forebay. The UHS pumps would not be connected to the fish-return system because the UHS makeup system only operates periodically or in the case of a design-based accident (DBA) (UniStar 2009c). The return system would be located on the east (Bay) side of the Unit 3 intake forebay about midway between the CCNPP Units 1 and 2 intake embayment and the existing barge dock. The proposed 18-in.-diameter high-density polyethylene fish-return outfall pipe would extend about 40 ft into the Bay with end of the pipe emerging from the Bay floor, but remaining below mean lower low tide level (UniStar 2009a). This design was chosen to minimize any drop at the exit point to facilitate the returning of the fish to the Chesapeake Bay (UniStar 2009a). Any bends in the pipes would be greater than 90 degrees to facilitate fish passage. The pipes would be smooth-walled and smooth-jointed to reduce potential fish abrasion (UniStar 2009b). About 40 linear ft of shoreline armoring would be removed to allow installation of the return pipe. A 6-ft-deep trench extending 40 ft from shore would be dredged to house the return pipe. The trench would be about 5 ft wide at the bottom and about 65 ft wide at the level of the Bay floor (Figure 3). An area of about 2600 ft^2 would be directly disturbed by the dredging. After the return pipe is placed in the trench, the trench would be backfilled with the dredged sand and stone material. A 10-ft by 10-ft section of the Bay bottom would be covered to a depth of 2 ft by a riprap apron. The shoreline armoring would be replaced. The existing fish-return system for CCNPP Units 1 and 2 would not be modified.

3.3 Cooling Water Discharge Structure

The 30-in.-diameter high-density polyethylene cooling water discharge pipe would be placed in a 550-ft-long trench dredged in a trapezoidal form at a 5:1 side slope to prevent sloughing of the trench sides (UniStar 2008b). The trench bottom would range from 3 to 6 ft wide, and the maximum width of the trench at the level of the Bay bottom would be about 70 ft. UniStar proposes to use a three-port diffuser, which, at 550 ft from the shoreline, would rise 3 ft above the bed of the Chesapeake Bay. Each diffuser port would direct water out of the pipe at an angle of 22.5 degrees above horizontal (Figure 4). A minimum area of about 38,500 ft^2 (0.88 ac) of Bay bottom would be directly disturbed by the pipeline installation. About 7000 yd^3 of material would be dredged for the pipe installation. About 5800 yd^3 of this material would be reused as trench fill with the remainder (about 1200 yd^3) being deposited at an existing upland (non-wetland), environmentally controlled disposal area at the Lake Davies laydown area on the site. Riprap with a median diameter of 12 in. and filter fabric would be placed on top of the backfilled material to provide a minimum 4 ft cover over the pipe. The riprap would be placed within discharge pipe trench to the top of the trench at the original grade of the Bay bottom, but would not extend above the existing Bay bottom. A 2-ft-deep riprap area would be placed to extend approximately 10 ft on each side of the 40-ft-long multiport diffuser. The area of Bay bottom covered by this riprap is about 800 ft^2.

3.4 Barge Dock Improvements

The existing barge slip for CCNPP Units 1 and 2 would be restored and extended to reestablish use during the construction of Unit 3. An area about 1500 ft long by 130 ft wide (average width), covering about 195,000 ft^2 (4.5 ac) of Bay bottom would be dredged to a bottom depth of −16 ft mean low water (UniStar 2008b). This would require the mechanical dredging of about 50,000 yd^3 of bottom substrates. UniStar considers the removal of sediment from about 1065 ft of the total length (about 45,000 yd^3) as maintenance dredging, with the removal of material from the remaining 435 ft (about 5000 yd^3) as new dredging beyond the original dredging limits of −16 ft mean low water. This extension is necessary to extend the proposed channel to tie into the same depth as the existing natural depth contour. Prior to dredging, two existing crane piles and one mooring bollard may be removed from the channel area (UniStar 2008b) (Figure 5 and Figure 6). Additional maintenance dredging would remove silt that has accumulated in the

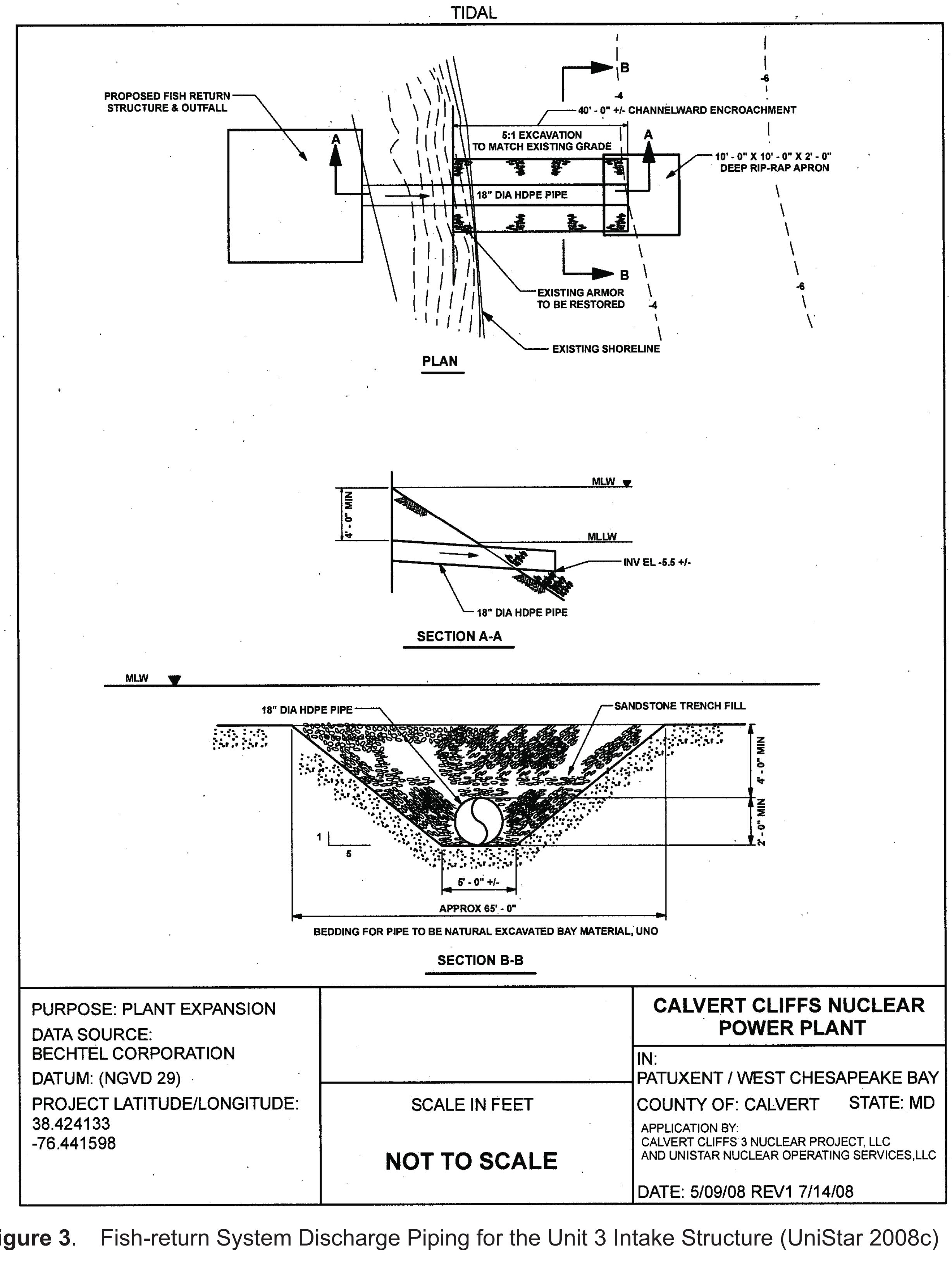

Figure 3. Fish-return System Discharge Piping for the Unit 3 Intake Structure (UniStar 2008c)

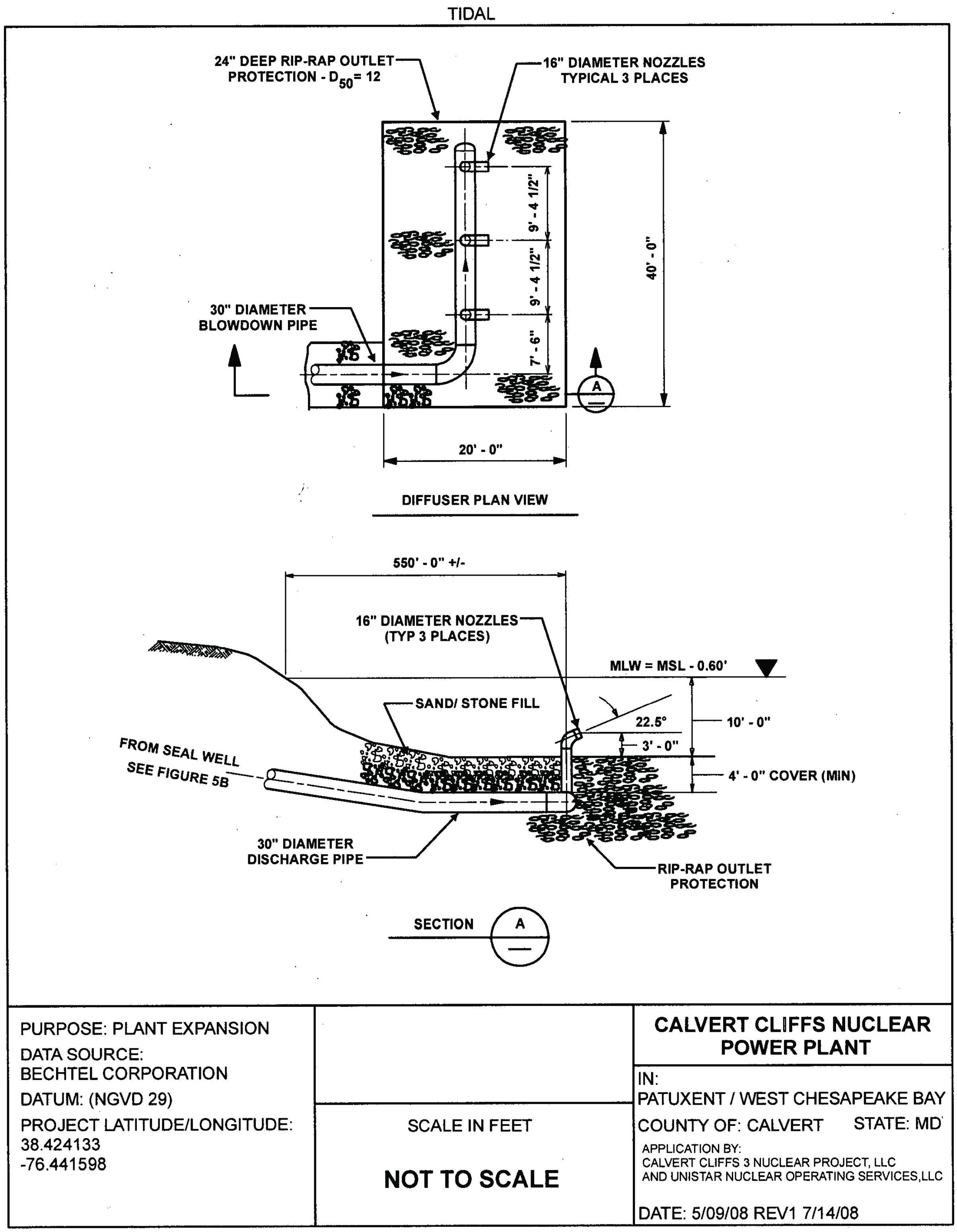

Figure 4. Details of the Unit 3 Cooling Water Discharge Outfall (UniStar 2008c)

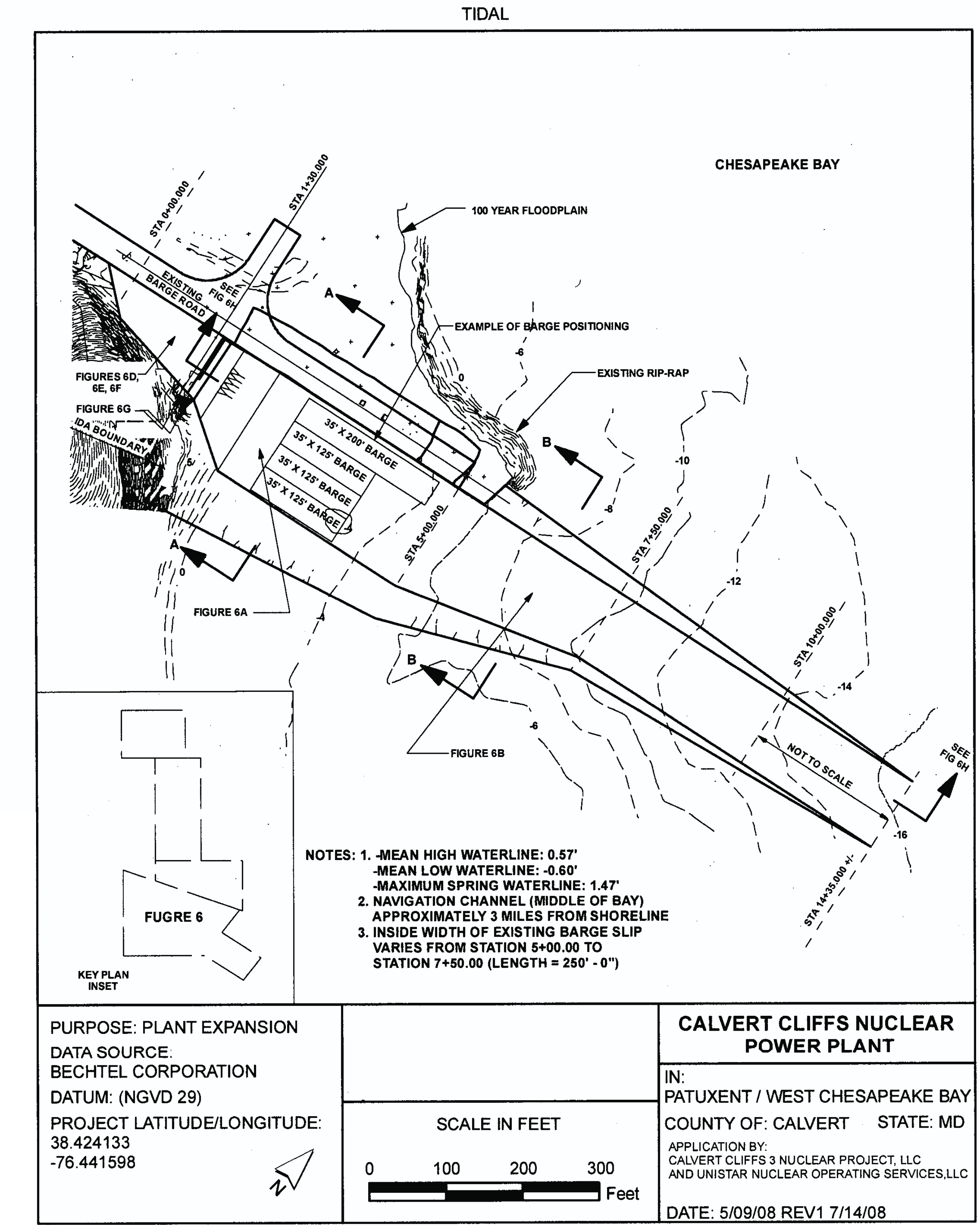

Figure 5. Proposed Restoration of Barge Slip (with existing contours) for the Construction of Unit 3 (UniStar 2008b)

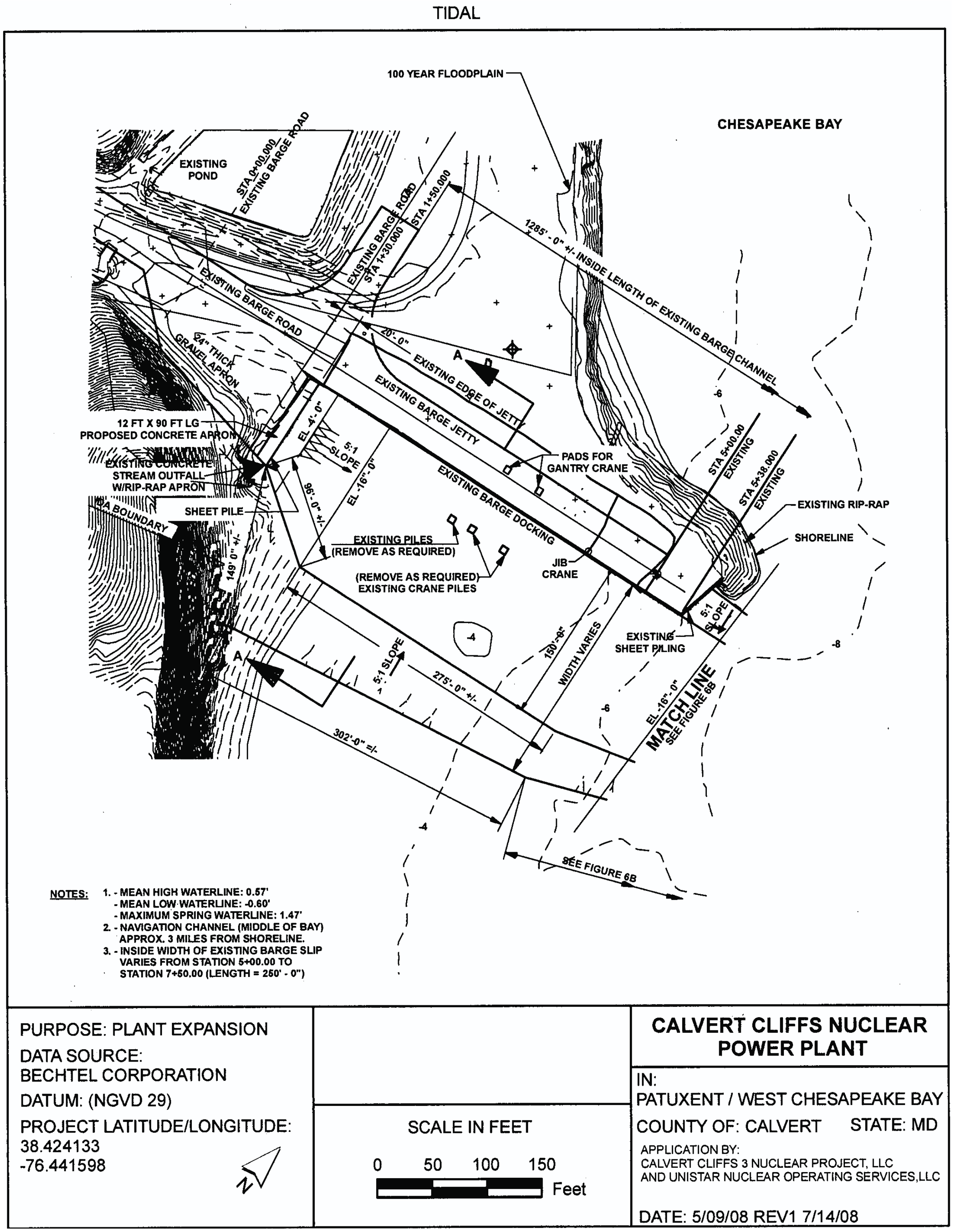

Figure 6. Proposed Modifications at the Existing Barge Unloading Facility for the Construction of Unit 3 (UniStar 2008b)

shoreward portion of the barge dock area during the past 30 years, altering the normal flow pattern from an existing culvert outfall. The area would be restored by installing a 12 ft by 90 ft concrete apron and a 90-ft-wide sheet-pile wall at the beach end of the area and building a 40-ft long by 40-ft wide by 2-ft deep riprap apron that would extend about 40 ft into the Bay covering about 1600 ft^2 (0.04 ac). The sheet-pile wall would be constructed of steel sheet piling supported by 30-in.-diameter soldier piles. The restoration would allow the discharge from the culvert outfall to flow directly in the Bay. The restoration is expected to take about 2 weeks.

Once the barge dock area has been refurbished, it would be used by barges that may be as large as 200 ft long and 50 ft wide. Typically, the barges used are about 35 ft wide. Barge drafts range from 2 ft to 11 ft, depending on the load. UniStar expects that the barge dock would be in use for about 5 years during the construction but stated that although there are no specific plans for maintenance dredging, eventual replacement of major components could require dredging in the future. UniStar has requested permission from the Corps to conduct maintenance dredging for 10 years (USACE 2008). The dredged material removed from the barge slip would be used during the plant construction as sand bedding for underground pipe installation or deposited at Lake Davies, an existing upland (non-wetland) environmentally controlled disposal area on site that was also used for previous dredge disposal. The dredged material would be characterized prior to use or disposal.

4.0 Essential Fish Habitat Species Descriptions

The proposed new unit at the Calvert Cliffs site is located in an area that is designated as EFH for species managed by the Mid-Atlantic Fishery Management Council. The NRC and the Corps conducted an evaluation by identifying and considering all designated EFH that occurs near the Calvert Cliffs site. The Maryland portion of the Chesapeake Bay was selected as the primary basis for the evaluation. The area of evaluation was further narrowed to the Chesapeake mainstem, the area most likely applicable to the Calvert Cliffs site (NMFS 2008a). The Patuxent River section of the Chesapeake Bay was also checked but did not add species to the list of those to be evaluated (NMFS 2008b). Only species having EFH within the mixing water/brackish salinity zone (0.5 to 25 parts per thousand) of the Bay or the Patuxent River were included in the final assessment. A separate list of skate habitats was checked for species with EFH in the Chesapeake Bay (NMFS 2009a).

The original list of candidates for EFH evaluation included 12 species (Table 1). However, the NMFS informed UniStar that the EFH designations for cobia, king mackerel, and Spanish mackerel were very broad and those species did not need to be considered further (UniStar 2008b). Therefore, final EFH evaluation list includes nine species.

Table 1. Species List of EFH Designations by Lifestage near Proposed CCNPP Unit 3

Species	Eggs	Larvae	Juveniles	Adults
black sea bass (*Centropristis striata*)			X	X
bluefish (*Pomatomus saltatrix*)			X	X
butterfish (*Peprilus triacanthus*)	X	X	X	X
clearnose skate (*Raja eglanteria*)			X	X
little skate (*Leucoraja erinacea*)			X	X
red drum (*Sciaenops ocellatus*)	X	X	X	X
summer flounder (*Paralichthys dentatus*)		X	X	X
windowpane flounder (*Scophthalmus aquosus*)			X	X
winter skate (*Leucoraja ocellata*)			X	X
cobia (*Rachycentron canadum*)[(a)]	X	X	X	X
king mackerel (*Scomberomorus cavalla*)[(a)]	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)[(a)]	X	X	X	X

Sources: NMFS 2008a, NMFS 2008b, NMFS 2009a, b, c, d, e, f and UniStar 2008b.
(a) Not considered further because of very broad EFH designations.

4.1 Black Sea Bass (Centropristis striata)

The black sea bass range along the east coast of North America from Nova Scotia to Florida (Drohan et al. 2007). The species occurs in the Chesapeake Bay from spring to late fall and is common in the mid and lower Bay (Murdy et al. 1997). Black sea bass migrate offshore in winter. Adults are typically found near structured habitats, such as shipwrecks, pilings, rocky areas and jetties, and shellfish beds (Murdy et al. 1997; Drohan et al. 2007). Some juveniles may overwinter in deeper waters in the Bay during mild years (Drohan et al. 2007). Juveniles in the Chesapeake Bay are closely associated with vegetated areas. Black sea bass are visual predators that feed during the day. Juveniles feed primarily on shrimp and small crustaceans, whereas adults eat mainly crabs, clams, and fish. Black sea bass are hermaphroditic with individuals maturing first as females. Most fish smaller than 7.5 in. long are females; larger fish are males (Drohan et al. 2007). Black sea bass may live as long as 20 years and reach a length of about 24 in. (Murdy et al. 1997). Spawning occurs in late spring to early fall over nearshore continental shelf habitats near large estuaries (Drohan et al. 2007). Development from egg through larval stages occurs in offshore water with juveniles (1.2 to 2.4 in. in length) migrating into estuaries during summer. There is a small commercial fishery for black sea bass in the Chesapeake Bay, and there is a popular sport fishery for the species (Murdy et al. 2007). Three stocks of black sea bass are used to manage the fishery. The mid-Atlantic stock includes the Chesapeake Bay. Recent year classes within this stock have shown strong growth in contrast to that for the south Atlantic stock (Drohan et al. 2007). The black sea bass recreational fishery has declined recently, although this may have resulted from increased minimum size limits (Kerns 2006).

EFH that includes Chesapeake Bay has been designated for black sea bass juveniles and adults. Inshore EFH for juveniles includes estuaries where black sea bass are identified as being common, abundant, or highly abundant for the mixing (0.5 to 25.0 ppt) and seawater (greater than 25 ppt) salinity zones. In general, juvenile black sea bass are found in waters warmer than 43°F with salinities greater than 18 ppt. Inshore EFH for adult black sea bass is similar to that designated for juveniles (NMFS 2009b).

4.2 Bluefish (Pomatomus saltatrix)

Bluefish are found on the western Atlantic coast from Nova Scotia to Brazil, but are rare in the Caribbean (Murdy et al. 1997). Bluefish of similar sizes form schools and migrate along the Atlantic coast moving up the Middle Atlantic Bight in spring from wintering grounds off Florida, then returning south in fall (Shepherd and Packer 2006). Schools can be large, often covering tens of square miles (Murdy et al. 1997). Bluefish visit the Chesapeake Bay from spring to autumn (Murdy et al. 1997). Spawning occurs in offshore waters during the northward migration with peak spawning off Chesapeake Bay occurring in July (Murdy et al. 1997; ASMFC 2006a). After spawning, smaller fish enter nearshore bays, such as Chesapeake Bay and Delaware Bay, while larger fish swim northward. Juveniles (1.8 to 2.4 in. long) move into estuaries and nearshore environments that serve as nursery grounds in late summer and eventually migrate out of the Bay in the autumn (Harding and Mann 2001; Shepherd and Packer 2006). In Chesapeake Bay, bluefish are abundant near the mouth of the Bay and common in the upper Bay in some years, but rarely occur north of Baltimore (Murdy et al. 1997). Bluefish reach a maximum length of about 45 in. and a weight of about 15 lbs (Shepherd and Packer 2006). Bluefish are voracious top-level predators. Bluefish larvae feed on planktonic copepods and transition to a fish diet at length of about 1.1 in., after which juveniles move into estuaries (Shepherd and Packer 2006). Bluefish feed opportunistically on whatever fish species are abundant (Shepherd and Packer 2006) and also eat invertebrates, such as blue crabs (*Callinectes sapidus*) (Buckel et al. 1999). In Chesapeake Bay, bluefish diet varies with location as fish feeding near oyster reefs eat more invertebrates than fish in the middle Chesapeake Bay (Harding and Mann 2001). This species is one of the most important recreational and commercial species in Chesapeake Bay with the recreational catch exceeding the commercial catch by an estimated five to six times (Murdy et al. 1997; ASMFC 2006a; Harding and Mann 2001). Bluefish are managed as a single stock, and the most recent review concluded that the species was not being overfished (Nygard 2005). Recreational and commercial catches in Maryland have decreased substantially since peak values in the late 1980s but have remained relatively stable since the mid 1990s (MDNR 2008). Despite reduced catches, the bluefish population estimates reflect a substantial increase in biomass from 1997 to 2004 (NOAA 2005).

EFH that includes Chesapeake Bay has been designated for bluefish juveniles and adults. Inshore EFH for juvenile and adult bluefish includes all major estuaries between Penobscot Bay, Maine and the St. Johns River, Florida (NMFS 2009c). Bluefish adults are highly migratory and distribution varies seasonally and according to the size of the individuals composing the schools. Bluefish generally are found where salinities exceed 25 ppt.

4.3 Butterfish (Peprilus triacanthus)

Butterfish range from Nova Scotia to Florida into the Gulf of Mexico (Murdy et al. 1997), but are most abundant between Cape Hatteras and the Gulf of Maine (Cross et al. 1999). Butterfish move into Chesapeake Bay about March and remain until about November. They are most abundant in the lower Bay, but occasionally may be common in the upper Bay as far north as the Patapsco River (Murdy et al. 1997). They overwinter in deep offshore waters. Butterfish are pelagic and form large, loosely structured schools. The short-lived species spawns offshore from May to July in the mid-Atlantic area with eggs remaining offshore during the 48-hr incubation period (Cross et al. 1999). Larvae eventually congregate around floating items, such as jellyfish, seaweed, and other debris. Juveniles, which range from 0.6 to 4.7 in. long (Cross et al. 1999), move into nearshore waters, including estuaries (Murdy et al. 1997) and still may be associated with jellyfish. Adults may reach a length of about 12 in. and, in the Chesapeake Bay, mature by their third summer (Cross et al. 1999). Juvenile butterfish feed on smaller plankton, whereas adults feed more broadly on pelagic tunicates, jellyfish, crustaceans, and small fish. Many predatory fish, including weakfish and bluefish, feed on butterfish. Commercial catches of butterfish peaked about 1973 along the Atlantic coast and have declined fairly steadily since, with the lowest landings occurring in 2005 (Overholtz 2006). Butterfish were of minor commercial importance in the Chesapeake Bay in the late 1990s, with most of the catch coming from Virginia waters (Murdy et al. 1997). There is little recreational fishing for butterfish.

EFH that includes Chesapeake Bay has been designated for butterfish eggs, larvae, juveniles, and adults. Inshore EFH for all butterfish life stages includes the mixing and/or seawater portions of all the estuaries where butterfish eggs are common, abundant, or highly abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (NMFS 2009d). Butterfish eggs usually are found from shore to 6000 ft. Butterfish larvae typically are found at water depths between 33 ft and 6000 ft. Juveniles and adults usually are found in depths between 33 ft and 1200 ft. The only portion of the Bay near the Calvert Cliffs site deeper than 33 ft is in the channel that was dredged for the intake system of Units 1 and 2 (EA Engineering 2007a).

4.4 Clearnose Skate (Raja eglanteria)

Clearnose skates are broadly distributed in coastal waters from Massachusetts to Texas, although they are rare in the northern parts of the range (Murdy et al. 1997; Packer et al. 2003a). Clearnose skates are primarily summer-to-fall residents of the Chesapeake Bay and are most abundant in the lower Bay (Murdy et al. 1997). These skates move out of the Bay to shallow offshore waters in the fall. Clearnose skates generally occur in waters with salinities greater than 22 ppt, particularly in the Chesapeake Bay (Packer et al. 2003a). Reproduction in waters north of Cape Hatteras occurs in spring and summer with each fertilized egg enclosed in a rectangular egg case that is deposited on the sea bottom (Packer et al. 2003a). Juveniles hatch from the egg cases after about 3 months and may eventually reach a length of about 30 in. at an age of more than 6 years. Clearnose skates are nocturnal feeders on many types of benthic invertebrates and small fish. Sharks are the main predators of clearnose skates. Clearnose skate eggs may be attacked by snails capable of boring into the capsules (Cox and Koob 1993). A relatively small fishery exists for skates with smaller skates primarily caught for lobster bait (Packer et al. 2003a; Sosebee 2006). Clearnose skates do not contribute much to the total skate catch and are not being overfished (Sosebee 2006). In the Chesapeake Bay, clearnose skates are considered a nuisance catch (Murdy et al. 1997).

EFH that includes Chesapeake Bay has been designated for clearnose skate juveniles and adults. EFH for juveniles includes soft-bottom substrates along the continental shelf and rocky or gravelly bottom, ranging from the Gulf of Maine south along the continental shelf to Cape Hatteras, North Carolina (NMFS 2009a). Clearnose skate juveniles and adults are most abundant from nearshore to waters less than 360 ft deep.

4.5 Little Skate (Leucoraja erinacea)

Little skates occur from Nova Scotia to Cape Hatteras and are most abundant between Georges Back and Delaware Bay (Murdy et al. 1997; Packer et al. 2003b). Little skates occasionally occur in the lower Chesapeake Bay in the winter and spring (Murdy et al. 1997). Although little skates tolerate relatively low salinities (about 20 ppt), they are most commonly found where salinities are about 30 ppt (Packer et al. 2003b). Like clearnose skates, little skates enclose a single fertilized egg within a capsule that is deposited on the sea floor. Reproduction may occur throughout the year. Development time varies depending on the season in which the capsule is deposited, but typically extends at least 6 months (Packer et al. 2003b). Juveniles are about 4 in. long at hatching. Adults may reach a total length of about 24 in. Little skates feed primarily on benthic invertebrates, particularly crabs and polychaete worms, but also may feed on fish. Little skates are eaten by sharks, other skates, and several boney fish species (Packer et al. 2003b). Little skate eggs may be attacked by snails capable of boring into the capsules (Cox and Koob 1993). Little skates are fished primarily for use as lobster bait and account for most of the bait fishery. They are not presently being overfished (Sosebee 2006). In the Chesapeake Bay, little skates are occasionally caught as bycatch in trawls and by hook and line (Murdy et al. 1997).

EFH that includes Chesapeake Bay has been designated for little skate juveniles and adults. EFH for juvenile and adult little skates includes muddy, sandy, or gravelly bottom habitats from Georges Bank to Cape Hatteras, North Carolina (NMFS 2009a). Both life stages are found in shallow nearshore waters, but generally are most abundant in waters from 240 to 299 ft deep.

4.6 Red Drum (Sciaenops ocellatus)

Although red drum are found from the Gulf of Maine to the northern coast of Mexico, they are less abundant along the Atlantic coast than in the Gulf of Mexico (Murdy et al. 1997). Adults occur in Chesapeake Bay from May to November, with the highest numbers near the mouth in spring and fall with salinities at greater than 15 ppt (Murdy et al. 1997). Red drum may occur as far up the Bay as the Patuxent River. Spawning occurs at night in nearshore coastal waters from late summer through autumn, and tidal currents carry larvae to nursery habitats in estuaries where they stay through the juvenile stage (Murdy et al. 1997; ASMFC 2006b; Rooker et al. 1999). Adult red drum may reach a maximum size of 5 ft and weigh up to 92 lb. Red drum are predators feeding primarily on crustaceans, such as blue crabs, and fish, such as bay anchovy (*Anchoa mitchilli*) and menhaden (*Brevoortia tyrannus*) (Scharf and Schlicht 2000). There is a small red drum fishery in Chesapeake Bay with a small catch in Maryland waters in 2006; an important red drum fishery throughout the Gulf of Mexico; and, to some extent, on the south Atlantic coast (Murdy et al. 1997).

EFH has been designated for red drum eggs, larvae, juveniles, and adults and includes tidal freshwater, emergent vegetated wetlands in estuaries, mangrove fringe in estuaries, submerged rooted vascular plants, oyster reefs and shell banks, soft-bottom sediments, ocean surf zones, and artificial reefs (NMFS 2009e). Many of these habitats, especially submerged vegetation and oyster reefs, occur in Chesapeake Bay. There is an oyster reef but no SAV near the Calvert Cliffs site. EFH for red drum is also included within the Patuxent River (NMFS 2008b).

4.7 Summer Flounder (Paralichthys dentatus)

Summer flounder range from Nova Scotia to South Florida, and most only visit Chesapeake Bay from spring to autumn, although some have been known to overwinter in the Bay (Murdy et al. 1997). Summer flounder migrate out of estuaries in late summer to early fall, but some may leave as late as early winter (Sackett et al. 2007). Tagging studies showed that many individuals return to the same estuary from which they emigrated (Sackett et al. 2007). Summer flounder are more common in the lower Chesapeake Bay than in the upper Bay. Spawning occurs during the migration offshore in the autumn with larvae typically most abundant about 15 to 50 mi from shore (NMFS 2009f). Recently settled juveniles enter Virginia waters in the lower Bay between October and May (Norcross and Wyanski 1994). They remain in inshore areas for the first year of life (Murdy et al. 1997; ASMFC 2007). The maximum adult size is about 37 in. Young-of-the-year (about 1 in. long) may reach the Calvert Cliffs site area sometime in spring (Nichols 2008). Juveniles (about 3 to 10 in. long) may occur in the area from spring through fall (Nichols 2008). Summer flounder are ambush predators that feed on many fish and invertebrate species, although bay anchovy and mysid shrimp (*Neomysis* spp.) make up about half their diet (Latour et al. 2008).

The summer flounder constitutes major commercial and recreational fisheries and is a highly sought food fish (Murdy et al. 1997; ASMFC 2007). The commercial fishery is primarily offshore, whereas the recreational fishery is in estuaries and bays (Latour et al. 2008). Though the summer flounder recreational catch has varied over the years, it approaches the commercial catch because of its popularity with anglers (Murdy et al. 1997; ASMFC 2007). Summer flounder are not yet overfished, but overfishing is occurring (Terceiro 2006). The estimated stock biomass increased substantially during the 1990s and through 2005, but it decreased slightly in 2006.

EFH that includes Chesapeake Bay has been designated for summer flounder larvae, juveniles, and adults (NMFS 2009f). Inshore EFH for summer flounder larvae, juveniles, and adults includes all the estuaries where summer flounder were identified as being present in the mixing and seawater salinity zones. HAPCs that include all native species of SAV, such as macroalgae, seagrasses, and freshwater and tidal macrophytes in beds of any size or in loose aggregations within juvenile and adult summer flounder EFH, have been designated (NMFS 2009f). SAV was not found during recent surveys conducted in the area of the Calvert Cliffs site (EA Engineering 2007b).

4.8 Windowpane Flounder (Scophthalmus aquosus)

Windowpane flounder (or windowpane) range from the Gulf of St. Lawrence to Florida (Murdy et al. 1997) and are most common around Georges Bank (Chang et al. 1999). Windowpane live year round in Chesapeake Bay and may be common as far north as the Choptank River (Murdy et al. 1997). The species can be abundant in the lower Bay. Windowpane spawn from spring to autumn, but they may not spawn during the middle of summer (Murdy et al. 1997; Chang et al. 1999). Eggs float and are about 0.06 in. in diameter. Larvae range in length from about 0.08 to 0.8 in., and juveniles reach lengths of up to about 8 in. (Morse and Able 1995). Adult windowpane can reach a total length of about 18 in. Juveniles and adults have broad diets, but they feed primarily on small crustaceans and worms, with small fish secondarily important (Chang et al. 1999; Link et al. 2002). The main predators of windowpane are spiny dogfish (*Squalus acanthias*), thorny skates (*Amblyraja radiata*), and other fish species (Chang et al. 1999). Windowpane in the mid-Atlantic region are managed as the Southern New England/Middle Atlantic (SNE-MA) stock (Hendrickson 2006). Windowpane catches are not typically targeted but are primarily bycatch for other fisheries probably because of the thinness of the fish. There is no commercial or recreational windowpane fishery in Chesapeake Bay (Murdy et al. 1997). Landings of the SNE-MA windowpane stock increased from the 1970s through 1985 but have since declined to a record low value in 2005 (Hendrickson 2006). Because there is no targeted fishery, the main cause of fishery mortality is probably as discarded bycatch from other targeted fishing. The most recent evaluation showed the stock was overfished, although overfishing was not occurring (Hendrickson 2006).

EFH that includes Chesapeake Bay has been designated for windowpane juveniles and adults. EFH for juveniles and adults includes muddy or fine-grained sandy bottom habitats (NEFMC 1998). Both life stages typically occur where waters are cooler than about 84°F, and salinities range between 5.5 and 36 ppt (NEFMC 1998).

4.9 Winter Skate (Leucoraja ocellata)

Winter skates range from the Gulf of St. Lawrence to Cape Hatteras and are most abundant on Georges Bank and in the northern Mid-Atlantic Bight (Packer et al. 2003c). In the lower Chesapeake Bay, winter skates are occasional residents from winter to spring (Murdy et al. 1997). Winter skates may reproduce all year, although there seems to be peak reproductive activity in summer and fall (Packer et al. 2003c). Fully developed juveniles hatch from egg capsules at about 4 to 5 in. in total length. Adults are relatively large, reaching lengths of about 3 to 4 ft. Winter skates have a diverse diet of invertebrates and fish, the latter being particularly important food for larger skates (Packer et al. 2003c). Sharks, other skates, and gray seals are the main predators of winter skates. Winter skates are fished as part of the export market for skate wings. The biomass of large skates, including winter skates, has decreased since the 1980s, and winter skates are considered as being overfished throughout most of the northwest Atlantic (Sosebee 2006). However, there are no commercial or recreational winter skate fisheries in the Chesapeake Bay (Murdy et al. 1997).

EFH that includes Chesapeake Bay has been designated for winter skate juveniles and adults. EFH for juvenile and adult winter skates includes muddy, sandy, or gravelly bottom habitats in Cape Cod Bay, on Georges Bank, the southern New England shelf, and through the Mid-Atlantic Bight to North Carolina (NMFS 2009a). Winter skate juveniles and adults frequent nearshore waters and are most abundant at depths less than 364 ft.

5.0 Potential Environmental Effects of the Proposed Federal Actions

This section describes the potential impacts from the construction and operation of the proposed Unit 3 at the Calvert Cliffs site to Federally managed estuarine and marine species and their habitats in Chesapeake Bay.

5.1 General Construction Impacts

Impacts to the EFH in Chesapeake Bay from construction of Unit 3 would be associated mainly with the construction of new water intake and discharge systems; construction of a new fish-return system; and the refurbishing of the existing barge dock area, including dredging in Chesapeake Bay. These activities would result in temporary and permanent loss or conversion of aquatic habitat in the Chesapeake Bay.

The major construction events associated with building Unit 3 that would affect EFH in the Chesapeake Bay share certain construction activities, such as dredging, pile driving, and armoring. All work would be conducted in accordance with Federal, State, and local permits that would be obtained by the applicant. EFH in Chesapeake Bay likely would not be adversely affected by the installation of new transmission facilities for Unit 3 because the facilities would be built on the uplands part of the Calvert Cliffs site.

The total proposed project dredging would permanently affect about 248,000 ft^2 (5.7 ac) of tidal open waters. About 52,500 ft^2 (1.2 ac) of the dredging would be backfilled.

5.1.1 Dredging and Pipeline Trenching

Dredging of the Bay bottom would be done by using shore-based or barge-mounted clamshell dredges to reestablish the channel on the south side of the existing CCNPP Units 1 and 2 barge dock and to create the trenches for the fish-return and the cooling water discharge pipelines. Dredging or pipeline trenching constitutes a major, localized impact to the benthos. Additional Bay bottom next to the pipeline trenches would be disturbed by the placement of the dredged material for later use in the backfilling the trenches. Effects of dredging for the installation of the Unit 3 intake pipes would be minimized by construction of a sheet-pile cofferdam and dewatering system. The benthic infauna community in the areas proposed for dredging or trenching for the construction of Unit 3 is similar to the community elsewhere in the region and also to the community type that has been in the area for many years. The community is moderately degraded to degraded (EA Engineering 2007a). Although this community probably provides some forage for fish, the area is not one of high benthic productivity.

In addition to the physical removal of Bay bottom, dredging, pipeline trenching, and backfilling increase the suspended sediment load in the water column. Suspended sediment may affect fish by clogging the gills and altering the feeding behavior of visual predators. It also may affect filter-feeding invertebrates and fish. However, the surficial sediments in the area that would be dredged are primarily sandy (refer to Section 2.1 of this EFH assessment) and likely would settle out of the water column relatively quickly. Some dredged material and water can be lost from the clam dredge as it is raised and deposited into the barge or as material is transferred from the barge to trucks. The potential resuspension of contaminants would not be a concern for the proposed dredging or trenching because the contaminant loads in the sediments in the barge dock area were shown to be very low (EA Engineering 2007a).

5.1.2 Pile Driving

Pile driving would be used in three project areas, all involving the installation of the sheet-pile walls. A vibratory hammer would be used to install the sheet piling and a conventional pile-driving hammer to install the 30-in.-diameter steel soldier piles that would be placed on 10-ft centers to support the sheet piling. The principal impact would be the generation of noise at levels that may be harmful to fish.

Pile driving noise may affect fish by causing temporary hearing loss, auditory tissue damage, and damage to non-auditory tissue, such as the swim bladder (Popper et al. 2006). Two criteria, both measured at a standard distance of 10 m (32.8 ft) from the pile-driving activity, are used to estimate the sound and vibration levels from pile driving that would injure fish. The peak sound-pressure level (peak pressure or peak), measured as decibels (dB) relative to reference level of one micro Pascal (dB re 1 μPa_{peak}), is maximum excursion of pressure associated with the sound (Popper et al. 2006). Peak pressure determines the likelihood that the swim bladder and ear would be exposed to extreme mechanical stress (Popper et al. 2006). The sound exposure level (SEL), measured as dB re 1 µPa2•s, is the constant sound level of 1-second duration that would contain the same acoustic energy as the originally produced sound.

The interim criteria (Popper et al. 2006) specified a peak level of 206 dB and a cumulative SEL level of 187 dB for fish weighing 2 gm and heavier or a cumulative SEL of 183 dB for fish lighter than 2 gm. The noise levels for the pile driving proposed for Unit 3 construction were estimated by applying compilations of measurements of noise and vibration impacts associated with various methods of pile driving, types of materials, and water depth. The estimated peak and cumulative SEL values for driving 24- to 36-in.-diameter steel piles with a conventional pile-driving hammer in about 5-m water depth are about 203 to 208 dB and 177 to 180 dB, respectively. These values suggest that driving 30-in.-diameter steel piles with conventional hammers at the Calvert Cliffs site may produce sound impacts that approach or exceed the peak pressure guidance criterion of 206 dB, but would not likely exceed the minimum SEL criterion of 183 dB for fish lighter than 2 gm. Sheet-pile driving produces peak pressures ranging from 175 dB to 180 dB and cumulative SEL values ranging from 160 dB to 165 dB, which are below the respective interim criteria values (UniStar 2008b). Noise from pile driving would most likely affect small EFH species or those with small lifestages (e.g., butterfish; black sea bass) in the area. Prey of some species also could be affected (e.g., bluefish; red drum).

5.1.3 Armoring

Key underwater structures in the project area would be armored with imported rocks, permanently converting the benthic substrate to rocky bottom. The largest area, about 4652 ft^2

(0.11 ac), that would receive rock armor is next to the new sheet-pile wall that would be installed to create the wedge-shaped pool for Unit 3. The armoring in the area next to the baffle wall would be added to the Bay bottom as a series of four overlying layers, ranging from washed gravel on the bottom to large quarry rock (average about 2 tons each rock) on the top (UniStar 2009d). The overall thickness of the armoring would vary according to the water depth. Armor would also be added to the Bay bottom at the end of the fish-return system, the cooling water discharge diffuser, and the nearshore area of the barge dock. Although some sediment suspension would occur during installation of the rock armor, the major effect would be the conversion of the benthic habitat from a soft-bottom infaunal community to a hard-bottom epifaunal community, which eventually is expected to colonize the rocks. The epifaunal community probably would include oysters, barnacles, mussels, and sea anemones, all of which colonized new hard-bottom habitat near the CCNPP Units 1 and 2 discharge pipe (Abbe 1987). The loss of soft-bottom habitat would likely reduce the potential forage area for some benthic-feeding EFH fish species (e.g., summer flounder, winter flounder, and skates). However, the area is not one of high benthic productivity, and the area that would be lost is relatively small.

5.1.4 Vessel Movements

Vessel use during the dredging or the installation of the in-water structures for Unit 3 would affect the aquatic resources of the area, particularly the benthos. The main effects from using vessels would include turbulence from propellers (prop wash), anchor cable scraping across the Bay bottom, and accidental spills of materials overboard. Vessels would be used during the installation of the cooling water discharge pipeline; during the offloading of materials from barges; and, probably, during the installation of the sheet-pile wall at the new intake area and the fish-return system outfall. The primary occurrence of vessels would be during the operation of the barge dock, which is expected to last about 5 years during construction of the proposed Unit 3. The proposed barge docking procedures would minimize the potential impacts from prop wash (UniStar 2008b). Vessel operation during construction would cause short-term, localized impacts to EFH near the Calvert Cliffs site. These impacts are not expected to affect the general resources in the area of the site or the region along this coast of the Chesapeake Bay.

5.2 General Operational Impacts

For EFH in Chesapeake Bay, the primary concerns related to water intake and consumption are those related to the relative amount of cooling water drawn from the Chesapeake Bay and the potential for organisms to be entrained into the cooling water system, impinged on the trash racks or intake screens, or entrapped in the wedge-shaped pool or common forebay. Entrainment and impingement have the potential to affect EFH species indirectly by reducing key prey species or directly by entrainment or impingement of the EFH species themselves. Entrapment in the wedge-shaped pool is possible but unlikely because fish may be able to swim back out to the Bay following the same route of entry. Entrapment in the common forebay for Unit 3 would not have an escape route with the exception of the fish-return system for organisms impinged on the CWS intake screens.

The intake system design for Unit 3 includes a fish-return system located at the CWS intake screens in the common forebay. There is no fish-return mechanism at the intake pipe openings in the wedge-shaped pool or at the UHS intake screens in the common forebay. The fish-return system may help increase survival following impingement by returning fish and crabs beneath the surface of the Bay.

UniStar stated that a closed-cycle, recirculating, wet cooling system with a cooling tower would be used for Unit 3 (UniStar 2009a). The intake system for Unit 3 would incorporate fish and invertebrate protection measures that may reduce entrainment and impingement. The estimated maximum intake volume of 47,383 gpm for Unit 3 would not exceed the EPA 1-percent water column criterion (UniStar 2009a). Unit 3 would have a fish-return system similar to the one used at existing CCNPP Units 1 and 2. Moreover, the through-screen flow velocity would be less than 0.5 ft/sec (0.15 m/sec) under the worst-case scenario of minimum Chesapeake Bay level with highest makeup demand flow (UniStar 2009a). The projected intake flow for Unit 3 is about 96.8 cfs, which is considerably less than the CCNPP Units 1 and 2 combined flow of 5332 cfs. Because the projected intake flow volume for Unit 3 is about 1.82 percent of that at CCNPP Units 1 and 2 and assuming that the relationship between flows is linear, the projected entrainment and impingement rates at Unit 3 would be correspondingly small.

5.2.1 Entrainment

The EFH species listed do not feed directly on plankton, but some are predators that consume planktivorous fish. The potential impact of Unit 3 from the entrainment of organisms into the cooling water system was evaluated by using historical (1974–1980) data collected at CCNPP Units 1 and 2. Sellner and Kachur (1987) determined that phytoplankton density in the discharge stream for Units 1 and 2 was significantly reduced compared to that in the intake stream. Phytoplankton photosynthesis metabolism was changed during passage through the plant such that carbon fixation was reduced. Importantly, however, Sellner and Kachur (1987) determined that these changes had no discernable effect on the phytoplankton densities or metabolism in the Chesapeake Bay waters near the Calvert Cliffs site. Olson (1987) found that zooplankton densities were less at the discharge point than they were at the intake point, which suggests that entrainment causes some zooplankton cropping. Olson also indicated survival after entrainment is typically very high and that no important changes in the zooplankton community could be detected. However, for this entrainment analysis, the review team used the conservative assumption of 100 percent mortality for entrained organisms.

The potential for direct effects on EFH species can be evaluated by considering information from the ichthyoplankton entrainment sampling that was conducted at the intake system of CCNPP Units 1 and 2 from March 2006 through September 2007 (UniStar 2008c). Additional ichthyoplankton samples were collected just outside the existing baffle wall separating the intake area from the open waters of the Bay from April to December 2006.

The total ichthyoplankton entrainment from March 2006 to September 2007, estimated at the maximum design flow for the intake systems of CCNPP Units 1 and 2, was at least 11.9 billion organisms, including fish eggs, larvae, juveniles, and adults (UniStar 2008c). This value is a minimum estimate of the total potential entrainment because daytime samples were not collected in March 2006, October through December 2006, and January through March 2007.

Most of the entrainment during the study occurred from May to September. The bay anchovy (all life stages), a key prey item for some EFH species, was the predominant taxon entrained, accounting for about 75 percent and 69 percent of the total organisms estimated as entrained during 2006 and 2007, respectively. About 5.7 million adult and 9.2 billion eggs, larvae, and juvenile bay anchovies were estimated to be entrained at the maximum design flow rate for CCNPP Units 1 and 2 during the 19-month study. In 2006, Sciaenid eggs, Atlantic menhaden eggs and larvae (another prey species for some EFH taxa), and naked goby larvae and juveniles (*Gobiosoma bosc*) accounted for about 18.5 percent, 3.3 percent, and 1.5 percent of the entrained organisms, respectively. Hogchoker eggs (*Trinectes maculatus*), sciaenid eggs, and Atlantic menhaden eggs and larvae accounted for about 14.1 percent, 6.0 percent, and 4.9 percent of the organisms, respectively, estimated entrained in 2007. Bay anchovy (all life stages), sciaenid eggs, Atlantic menhaden eggs and larvae, and naked goby larvae and juveniles were the predominant organisms collected just outside the intake system baffle wall, although the proportional contribution of each varied somewhat (UniStar 2008c). Comparisons of the intake and baffle-wall samples showed that most taxa entrained at rates relative to their occurrence in the Bay waters. However, juvenile bay anchovies, American eel (*Anguilla rostrata*) juveniles, Atlantic menhaden eggs and larvae, and sciaenid eggs were more abundant at the intake than they were at the baffle wall.

The April through September Units 1 and 2 entrainment data for each year were used to estimate the potential total entrainment by the Unit 3 intake system because only those months had samples collected during the day and night. The April through September time period was the main period of entrainment captured by the study. Entrainment of most species and lifestages, except Atlantic croaker (*Micropogonias undulatus*) juveniles, was nonexistent or very reduced between October and March. Total estimated entrainment by Units 1 and 2 during April to September varied considerably between the 2 years, with 7.3 billion organisms entrained in 2006 and 759 million entrained in 2007. The estimate also considered that the projected intake flow volume for Unit 3 would be about 1.82 percent of that at CCNPP Units 1 and 2 and assumed that the relationship between flows is linear. The projected April through September ichthyoplankton entrainment by the Unit 3 intake system would range from about 83 million to about 132 million organisms. These values are much less than the variability in entrainment by the two existing units. The projected annual entrainment by Unit 3 would not be much greater than the April to September estimates, with the possible exception of Atlantic croaker juveniles, because entrainment at Units 1 and 2 from April through September is much greater than it is during the rest of the year. The projected combined April through September ichthyoplankton entrainment for all three units during those months would range from about 4.6 billion to 7.4 billion organisms.

5.2.2 Impingement and Entrapment

Impingement sampling was conducted at CCNPP Units 1 and 2 from 1975 through 1995 (Ringger 2000). Peak fish impingement occurred during the spring and summer. Blue crab, a potential prey species for some EFH species, impingement was greatest in spring, summer, or fall. There did not to appear to be annual trends, except that impingement generally appeared to be less after 1986 than it was before. The apparent difference in impingement rates before and after the mid-1980s may be related to several operational and structural modifications to the intake and fish-return systems that were made from about 1984 to 1986, partly in response to severe impingement events that occurred in 1983 (Ringger 2000). The most commonly impinged fish during the 21-year period were bay anchovy, hogchoker, spot (*Leiostomus xanthurus*), and Atlantic menhaden. Blue crab impingement, as that for fish, generally was lower after the mid 1980s than before.

The average annual fish and blue crab impingement rates predicted for Unit 3 are 23,683 fish and 11,403 crabs. These resulted in estimated average annual impingement mortality rates at Unit 3 of 6327 fish and 62 crabs. The impingement mortality estimate for fish and crabs probably is somewhat conservative because the entire 21-year data set was used for the calculations regardless of apparently reduced impingement after modifications made in the mid 1980s. Also, the Unit 3 intake approach velocities within the forebay would be less than 0.5 ft/sec (0.15 m/sec), which would allow more crabs to avoid impingement.

Special Condition N of the NPDES permit for CCNPP Units 1 and 2 requires notification within 24 hours of any impingement on the water intake apparatus of aquatic organisms substantial enough to cause modification to plant operations (UniStar 2009a). Significant fish kills involving cownose rays (*Rhinoptera bonasus*) that were impinged on the trash racks of Units 1 and 2 were reported in summer 2005 (80 to 100 rays) and 2006 (50 to 200 rays) (NRC 2005, NRC 2006a, b).

Water from the wedge-shaped pool would enter the common forebay that would supply water to the CWS and UHS intakes (Section 3.1 of this EFH assessment). Organisms impinged on the trash racks at the intake pipe openings would likely die because there is no rake or return system at that interface with the Bay. Such organisms would likely be larger than 3.5-in., which is the spacing between the trash bars. Because traveling screens and the fish-return system would be located at the CWS intake, smaller organisms would enter the common forebay. Organisms pulled toward the CWS pumps would be entrained as already discussed, impinged at the CWS trash rack, or impinged at the CWS traveling screens then delivered to the fish-return system for passage to the Bay. Organisms pulled toward the UHS pumps during its periodic operation would be lost to impingement at the UHS trash racks or traveling screens because that system would not be connected to a fish-return system. The common forebay would hold a large volume of water, and it is likely that some organisms entering the forebay could become trapped within it without necessarily being entrained or impinged at CWS or UHS intakes. All approach velocities would be small, and all organisms would not be pulled into the pump system. There would be no mechanism to remove entrapped organisms from the common forebay other than the fish-return system associated with the CWS traveling screens (UniStar 2009c). It is not possible to accurately estimate the numbers of the individuals that would be entrapped. The species most likely to become entrapped would be those that were represented in results of entrainment and impingement studies conducted at Units 1 and 2 (Section 5.2.1). Some species may thrive in the common forebay, while others may not. Regardless, all organisms entrapped in the forebay would be effectively removed from the Bay ecosystem.

5.2.3 Aquatic Thermal Impacts

The effluent discharge from Unit 3 would be directly into the Chesapeake Bay and would include blowdown from the CWS cooling tower, the essential service water system (ESWS) cooling towers, the desalination plant, liquid radiological effluent, and site waste streams. CORMIX modeling showed that the expected discharge plume from Unit 3 would be small and would not interact with the plume from Units 1 and 2. Abbe (1987) evaluated the potential effects of the thermal discharge from CCNPP Units 1 and 2, which is almost 1 mi north of the Unit 3 discharge location, and concluded that the thermal discharge from CCNPP Units 1 and 2 had no important adverse impacts on fish or key invertebrate species, such as eastern oysters (*Crassostrea virginica*) and blue crabs. The Maryland Power Plant Research Program (PPRP) concluded that the effects of thermal discharges from the power plants into Chesapeake Bay habitats were localized and not considered significant (MDNR PPRP 2008a). The waste heat from the Unit 3 discharge would dissipate quickly because of the small size of the thermal plume and would not likely affect EFH taxa or habitat significantly.

Cold shock occurs when aquatic organisms that have been acclimated to warm water, such as fish in a power plant’s discharge canal, are exposed to a sudden temperature decrease. This sometimes occurs when power plants shut down suddenly in winter. Abbe (1987) concluded the potential for cold shock associated with the discharge plume from CCNPP Units 1 and 2 probably was not significant because the relatively small area of warmer water did not attract many fish during the winter. The volume of effluent discharge from Unit 3 would be much smaller than that from Units 1 and 2 and small in comparison to the volume of the Bay (UniStar 2009a). Therefore, the warmer effluent water would mix quickly with the cooler ambient water given normal Bay flow patterns so that the thermal discharge would not attract many organisms. Cold shock is unlikely to be a factor for EFH species at the Unit 3 site.

5.2.4 Chemical Impacts

UniStar indicates that chemicals, such as anti-scaling compounds, corrosion inhibitors, and biocides, would be added to the CWS and the ESWS (UniStar 2009a). Biofouling normally would be controlled by injecting chlorine or bromine into the Chesapeake Bay influent water during the spring through fall (UniStar 2009a). The CWS would provide about 90 percent of the effluent discharged into the Chesapeake Bay, with the desalinization plant contributing another 9 percent (UniStar 2008a). UniStar provided estimated concentrations of various constituents in the waste stream, which would include a small radioactive effluent (with a dose low enough not to affect biota), based on design data. To illustrate the expected low concentrations of these constituents, UniStar compared expected concentrations of five metal contaminants (arsenic, chromium, copper, nickel, and zinc) to aquatic life chronic salt water limits specified by the State of Maryland (COMAR 2008). Predicted concentrations within the discharge from Unit 3 would be substantially less than the State aquatic life limits (UniStar 2008a). UniStar would calculate more precise estimates of constituent concentrations in the effluent as part of the permitting process for Unit 3. The NRC determined that the effluent discharge from Units 1 and 2 would not significantly change the salinity gradients near the CCNPP site (NRC 2000). The addition of the relatively small discharge volume from Unit 3 would not be expected to alter this determination.

UniStar expects that the NPDES permit for Unit 3 would require bioassay testing, as does the permit for Units 1 and 2, to assess the potential toxicity of the discharge and provide for corrective action if necessary. To date, the bioassay testing performed for CCNPP Units 1 and 2 has not indicated any toxicity to test organisms (UniStar 2009a).

5.2.5 Physical Impacts from Discharge

The NRC determined that the effluent discharge from Units 1 and 2 would not significantly change the current patterns near the Calvert Cliffs site (NRC 2000). The addition of the relatively small discharge volume from Unit 3 would not be expected to alter this determination. The primary physical and ecological impacts from the CCNPP Units 1 and 2 cooling water discharge are sediment scour near the high-velocity discharge ports. The bottom scour associated with the discharge from CCNPP Units 1 and 2 was about 42 ac (UniStar 2008a). The sand substrate present prior to the operation of CCNPP Units 1 and 2 was scoured by the discharge, leaving a hard clay substrate. The benthic community changed from one characterized by burrowing soft-bottom organisms to one dominated by fouling organisms (UniStar 2008a).

The area of Bay bottom that may be scoured would be minimized by the placement of riprap for about 10 ft on either side of the diffuser (UniStar 2008b). The potential scour area was estimated by comparing the sediment type to expected discharge flow velocities. Sediments in the area are primarily sandy (see Section 2.1 of this EFH assessment), and UniStar calculated that a water velocity of about 1 ft/sec would be required to move sand particles of a size between 0.210 mm and 0.177 mm (0.008 and 0.007 in.) (UniStar 2008a). The distance beyond which water velocities are expected to drop below the 1 ft/sec threshold was estimated to be about 92 ft, which resulted in an estimated potential scour area of 13,256 ft^2 (0.3 ac). Therefore, the physical impacts associated with Unit 3 cooling water discharge would be limited to sediment scour of a small area.

The infaunal community inhabiting the area near the discharge point, which was characterized during 2006 and 2007 (EA Engineering 2007a), was moderately degraded to degraded (Section 2.1 of this EFH assessment). The community had low organism abundance and few species. The predominant taxa were polychaete worms (*Streblospio benedicti*; *Glycinde solitaria*) and a small clam species (*Gemma gemma*). A historical study of benthic fish feeding at a location north of the Calvert Cliffs site (Kenwood Beach) found that nematode worms and polychaetes were among the predominant prey (UniStar 2008a).

The bottom scouring near the discharge from CCNPP Units 1 and 2 caused the habitat to change from sandy sediment to hard clay and also caused a change from a sand-inhabiting infaunal community to an epifaunal community consisting of oysters, mussels, barnacles, and sea anemones (Abbe 1987). A similar, but much less extensive, change is likely if the sediment becomes scoured near the discharge for Unit 3. The small predicted size of the potential scour area and relative impoverishment of the infaunal community that would be replaced would not have much effect on the regional infaunal populations or their predators.

5.3 Potential Effects of the Proposed Federal Actions on EFH Species

5.3.1 Black Sea Bass

The construction activities with the greatest potential to affect black sea bass EFH would be the pile driving associated with the installation of the sheet-pile wall at the proposed wedge-shaped pool and the dredging for the refurbishment of the barge dock, installation of the fish-return pipeline, and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect small black sea bass juveniles as described in Section 5.1.2. Increased water column sediment loads from dredging could affect juveniles and adults, which are visual predators. The overall effects of these would be reduced by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser could provide habitat for black sea bass.

Direct operational impacts to black sea bass EFH would most likely be from impingement and possibly entrapment. Black sea bass occurred in 6 of the 21 yearly impingement samples collected from CCNPP Units 1 and 2 between 1975 and 1995 (Ringger 2000). However, the species only occurred in 1 year from 1984 to 1995, which could indicate a reduced likelihood of impingement and entrapment. Black sea bass eggs and larvae do not occur near Calvert Cliffs (Drohan et al. 2007). Therefore, entrainment or entrapment of early life stages is not expected. Black sea bass eggs, larvae, and juveniles were not found in the entrainment samples collected in the CCNPP Units 1 and 2 intake system or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Some juvenile and adult black sea bass prey, such as bay anchovy and scup (*Stenotomus chrysops*), likely would be entrained, impinged, and/or entrapped by the Unit 3 cooling water system. However, black sea bass diets are diverse (Drohan et al. 2007), and the overall effects likely would not be important. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for black sea bass.

5.3.2 Bluefish

The construction activities with the greatest potential to affect bluefish EFH would be the pile driving associated with the installation of the sheet-pile wall at the new intake location and the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect small bluefish juveniles as described in Section 5.1.2. Increased water column sediment loads from dredging could affect juveniles and adults, which are visual predators. The overall effects of these would be reduced by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation.

Direct operational impacts to bluefish EFH would most likely be from impingement and possibly entrapment. Bluefish occurred in the impingement samples collected from the CCNPP Units 1 and 2 intake system in 9 of the 21 years from 1975 to 1995 (Ringger 2000), although they occurred in only 1 year after 1984, which could indicate a reduced likelihood of impingement and entrapment. Bluefish were not found in the entrainment samples collected in the CCNPP Units 1 and 2 intake system or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Impingement, entrainment, and entrapment could indirectly affect bluefish EFH because some of the key bluefish prey species, Atlantic menhaden and bay anchovy (Hartman and Brandt 1995), are captured by the intake system for CCNPP Units 1 and 2 and, therefore, would likely be affected by CCNPP Unit 3. However, bluefish feed opportunistically on abundant species and likely would feed on prey other than menhaden and bay anchovy if necessary (Shepherd and Packer 2006). Also, the intake system for Unit 3 would draw much less water than that for Units 1 and 2 and would not be expected to add significantly to the numbers of these prey species impinged, entrained, or entrapped. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for bluefish.

5.3.3 Butterfish

The construction activities with the greatest potential to affect butterfish EFH would be the pile driving associated with the installation of the sheet-pile wall at the new intake location and the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect butterfish larvae and juveniles as described in Section 5.1.2. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. However, these life stages typically occur in waters deeper than where pile driving or dredging would occur. The overall effects of these would be reduced further by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation.

Direct operational impacts to butterfish EFH would most likely be from impingement and possibly entrapment. Butterfish occurred in 15 of the 21 yearly impingement samples collected from CCNPP Units 1 and 2 between 1975 and 1995 (Ringger 2000). However, the species only occurred in 5 years from 1984 to 1995, which could indicate a reduced likelihood of impingement and entrapment. The intake system for Unit 3 would draw much less water than that for Units 1 and 2 and would not be expected to add significantly to the numbers of butterfish impinged. Butterfish were not caught in entrainment samples collected from the intake for Units 1 and 2 or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. The planktonic prey of butterfish may be entrained or entrapped by the Unit 3 cooling water system. Entrainment studies conducted at CCNPP Units 1 and 2 showed no significant effects on plankton communities in the area (Section 5.2). The small water volume withdrawn by the Unit 3 intake system reduces the potential for important effects on butterfish prey. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the butterfish.

5.3.4 Clearnose Skate

The construction activities with the greatest potential to affect clearnose skate EFH would be the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. The overall effects of dredging would be reduced by the use of turbidity curtains during dredging and pipeline installation. Noise from pile-driving activities is not expected to adversely affect clearnose skates because the individuals most likely in the area would be relatively large and not as susceptible as smaller fish. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for clearnose skates. Disturbances to the benthos, including armoring, could affect benthic prey resources for clearnose skates. However, the benthic habitat near the Calvert Cliffs site is not highly productive and constitutes only a relatively small portion of the available benthic habitat in the Bay.

Direct operational impacts to clearnose skate EFH would most likely be from impingement on the trash racks. Clearnose skates were not listed in the yearly impingement samples collected from the CCNPP Units 1 and 2 traveling screens between 1975 and 1995 (Ringger 2000). However, other large elasmobranchs (cownose ray) occasionally have impinged in large numbers on the trash racks at the existing CCNPP Units 1 and 2, probably as a result of low oxygen levels during the summer (NRC 2005, NRC 2006a, b). Clearnose skates were not caught in entrainment samples collected from the intake for Units 1 and 2 or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Clearnose skates are benthic feeders whose diets would not be adversely affected by the potential entrainment, impingement, and entrapment of prey by the Unit 3 cooling water intake system. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the clearnose skate.

5.3.5 Little Skate

The construction activities with the greatest potential to affect little skate EFH would be the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. The overall effects of dredging would be reduced by the use of turbidity curtains during dredging and pipeline installation. Noise from pile-driving activities is not expected to adversely affect little skates because the individuals most likely in the area would be relatively large and not as susceptible as smaller fish. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for little skates. Disturbances to the benthos, including armoring, could affect benthic prey resources for little skates. However, the benthic habitat near the CCNPP site is not highly productive and constitutes only a relatively small portion of the available benthic habitat in the Bay.

Direct operational impacts to little skate EFH would most likely be from impingement on the trash racks. Little skates were not listed in the yearly impingement samples collected from the

CCNPP Units 1 and 2 traveling screens between 1975 and 1995 (Ringger 2000). However, other large elasmobranchs (cownose ray) occasionally have impinged in large numbers on the trash racks at the existing CCNPP Units 1 and 2, probably as a result of low oxygen levels during the summer (NRC 2005, NRC 2006a, b). Little skates were not caught in entrainment samples collected from the intake for Units 1 and 2 or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Little skates are benthic feeders whose diets would not be adversely affected by the potential entrainment, impingement, and entrapment of prey by the Unit 3 cooling water intake system. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the little skate.

5.3.6 Red Drum

The construction activities with the greatest potential to affect red drum EFH would be the pile driving associated with the installation of the sheet-pile wall at the new intake location and the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect red drum larvae and juveniles as described in Section 5.1.2. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. The overall effects of these would be reduced further by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for red drum.

Direct operational impacts to red drum EFH would most likely be from impingement and entrapment. Red drum occurred in the impingement samples collected from CCNPP Units 1 and 2 only in 1983 (Ringger 2000), which could indicate a low likelihood of impingement and entrapment. Red drum were not specifically identified in the entrainment samples collected in the CCNPP Units 1 and 2 intake system or from the baffle wall in 2006 and 2007 (UniStar 2008c). However, sciaenid eggs, which were not identified further, were the second most common organism entrained. These were not likely red drum eggs because red drum spawn primarily in nearshore coastal waters. Impingement, entrainment, and entrapment could indirectly affect red drum EFH because some of the potential prey species in the Chesapeake Bay, such as Atlantic menhaden and bay anchovy, are captured by the intake system for CCNPP Units 1 and 2. However, the intake system for Unit 3 would draw much less water than that for Units 1 and 2 and would not be expected to add significantly to the numbers of these prey species impinged, entrained, or entrapped. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the red drum.

5.3.7 Summer Flounder

The construction activities with the greatest potential to affect summer flounder EFH would be the pile driving associated with the installation of the sheet-pile wall at the new intake location and the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect summer flounder juveniles of the size potentially found near the site as described in Section 5.1.2. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. The overall effects of these would be reduced further by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for summer flounder. Disturbances to the benthos, including armoring, could affect benthic prey resources for summer flounder. However, the benthic habitat near the Calvert Cliffs site is not highly productive and constitutes only a relatively small portion of the available benthic habitat in the Bay.

Direct operational impacts to summer flounder EFH would most likely be from impingement and entrapment. Summer flounder occurred in impingement samples collected from the CCNPP Units 1 and 2 intake system in 18 of the 21 years from 1975 to 1995 and was the fifth most-impinged species in 1984 (Ringger 2000). About 90 percent of impinged summer flounder survive. Despite the possible occurrence of smaller individuals at the Calvert Cliffs site, summer flounder were not caught in entrainment samples collected from the intake for Units 1 and 2 or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Impingement, entrainment, and entrapment could indirectly affect summer flounder EFH because one of the key prey species, bay anchovy (Latour et al. 2008), is captured by the intake system for CCNPP Units 1 and 2. However, the intake system for Unit 3 would draw much less water than that for Units 1 and 2 and would not be expected to add significantly to the numbers of these prey species impinged, entrained, or entrapped. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the summer flounder.

5.3.8 Windowpane Flounder

The construction activities with the greatest potential to affect windowpane flounder EFH would be the pile driving associated with the installation of the sheet-pile wall at the new intake location and the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. The noises from pile driving likely would be loud enough to affect windowpane flounder juveniles as described in Section 5.1.2. Increased water column sediment loads from dredging could affect juveniles and adults as described in Section 5.1.1. The overall effects of these would be reduced further by the relatively short time over which pile driving would occur and the use of turbidity curtains during dredging and pipeline installation. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for windowpane flounder. Disturbances to the benthos, including armoring, could affect benthic prey resources for windowpane flounder. However, the benthic habitat near the Calvert Cliffs site is not highly productive and constitutes only a relatively small portion of the available benthic habitat in the Bay.

Direct operational impacts to windowpane flounder EFH would most likely be from impingement and entrapment. Windowpane flounder occurred in 5 of the 21 yearly impingement samples collected from CCNPP Units 1 and 2 between 1975 and 1995 (Ringger 2000). However, the species only occurred in 1 year from 1981 to 1995, which could indicate a reduced likelihood of impingement and entrapment. Windowpane flounder were not caught in entrainment samples collected from the intake for Units 1 and 2 or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Windowpane flounder are benthic feeders whose diets would not be adversely affected by the potential entrainment, impingement, or entrapment of prey by the Unit 3 cooling water intake system. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the windowpane flounder.

5.3.9 Winter Skate

The construction activities with the greatest potential to affect winter skate EFH would be the dredging for the refurbishment of the barge dock and installation of the cooling water discharge and fish-return pipelines. Increased water column sediment loads from dredging could affect larvae, juveniles, and adults as described in Section 5.1.1. The overall effects of dredging would be reduced by the use of turbidity curtains during dredging and pipeline installation. Noise from pile-driving activities is not expected to adversely affect winter skates because the individuals most likely in the area would be relatively large and not as susceptible as smaller fish. Armoring near the new baffle wall, the fish-return discharge point, and the cooling water discharge diffuser would make the habitat less suitable for winter skates. Disturbances to the benthos, including armoring, could affect benthic prey resources for winter skates. However, the benthic habitat near the Calvert Cliffs site is not highly productive and constitutes only a relatively small portion of the available benthic habitat in the Bay.

Direct operational impacts to winter skate EFH would most likely be from impingement on the trash racks. Winter skates were not listed in the yearly impingement samples collected from the CCNPP Units 1 and 2 traveling screens between 1975 and 1995 (Ringger 2000). However, other large elasmobranchs (cownose ray) occasionally have been impinged in large numbers on the trash racks at the existing CCNPP Units 1 and 2, probably as a result of low oxygen levels during summer (NRC 2005, NRC 2006a, b). Winter skates were not caught in entrainment samples collected from the intake for Units 1 and 2 intake system or at the baffle wall in 2006 and 2007 (UniStar 2008c), which indicates that there is a low likelihood of entrainment by the Unit 3 CWS. Winter skates are benthic feeders whose diets would not be adversely affected by the potential entrainment and impingement of prey by the Unit 3 cooling water intake system. Therefore, the construction and operation of the proposed new Unit 3 at the Calvert Cliffs site are likely to have a more than minimal, although not substantial, adverse effect on EFH for the winter skates.

6.0 Cumulative Effects

The NRC and the Corps review team considered potential cumulative effects on EFH and Federally managed fish and shellfish species in conjunction with building and operating a new nuclear unit at the Calvert Cliffs site. For this analysis, past and present actions create the existing baseline conditions, and cumulative effects include the effects of future State, Tribal, local, and private actions that are reasonably certain to occur in the action area considered in this assessment. The future is defined as the start of construction of the proposed Unit 3 until the conclusion of decommissioning. The action area for this evaluation is the Calvert Cliffs site and the mesohaline (salinity ranges from about 5 to 19 ppt) western portion of the Chesapeake Bay. The extent of the mesohaline zone in the Chesapeake Bay varies seasonally, but at its maximum, includes the western Bay shore from near the mouth of the Rappahannock River to Baltimore (MDNR PPRP 2008a; CBP 2009).

Two future non-Federal projects were identified within the action area. Reinforcing an existing pier at the Cove Point liquefied natural gas (LNG) terminal, about 3.5 mi southeast of the Calvert Cliffs site, would involve installing 108-in.-diameter tubular steel monopile mooring dolphins, reinforcing existing and installing new breasting dolphins, installing walkways, and dredging about 30 ac of Bay bottom around the pier to a depth of about −45.0 ft mean low water (USACE 2009). Suitable dredged material would be placed in a stone-reinforced area along 2513 ft of shoreline and extending an average of 225 ft channelward to create a tidal marsh. The effects of this project on EFH would be similar to the effects from construction of the in-water components described for the proposed Unit 3. Because the Cove Point LNG terminal is close to the Calvert Cliffs site, it is likely that similar species and habitats would exist and experience similar localized effects. In additionally, ongoing operation of the terminal could affect EFH as a result of vessel operation, most notably through the use of Chesapeake Bay water for ballast. The addition of ballast water to a vessel would likely remove certain life stages of certain species from the immediate area. Such removal could have similar effects on the populations as impingement, entrapment, and entrainment from operation of the proposed CCNPP Unit 3.

Building and operating a new nuclear reactor on the Calvert Cliffs site could interact with a part of the proposed Mid-Atlantic Power Pathway (MAPP) project, which proposes to build a 500-kV transmission line from Possum Point, Virginia to Salem, New Jersey (MAPP 2009a). The second part of the MAPP project would involve building an underwater crossing through the Chesapeake Bay, extending from Calvert Cliffs to the Maryland eastern shore. The route could include broadband fiber optic cables (PHI 2009). Details of this part of the project are not yet available, but the installation of underwater cables could involve horizontal directional drilling from the shore into the Bay and some type of trenching to install the cable within the Bay. The schedule suggests that the crossing under the Bay is expected to be completed in 2014 (MAPP 2009b). The MAPP project could affect benthic habitats and noise-sensitive species in the same nearshore area off the Calvert Cliffs site, but such impacts are expected to be temporary as benthic organisms would recolonize the area, and mobile organisms would avoid noisy construction areas.

CCNPP Units 1 and 2 will continue to operate during the construction and operation of proposed Unit 3. Calvert Cliffs Nuclear Power Plant, Inc. requested power uprates for the two units that will increase the generating capacity of each unit by about 1.38 percent. The uprate was completed in December 2009 for Unit 2, and a decision is expected by the end of summer 2010 for Unit 1 (NRC 2009). The uprates would likely result in a small increase in water withdrawn from the Bay and a small increase in the temperature of water discharged to the Bay. Neither increase would be expected to add significantly to the present effects of Units 1 and 2 on the Bay, nor the combined effects of Units 1, 2, and 3.

The Calvert Cliffs site operations, other anthropogenic stressors, and climatic events could combine to adversely affect EFH and Federally managed fish and shellfish species of the Chesapeake Bay. Commercial and recreational fishing pressure, the most noticeable anthropogenic stressor, has significantly affected aquatic resources in the Bay, causing population declines for several species (Greiner and Vogt 2009). Heavy fishing pressure, in conjunction with habitat loss and pollution, has caused serious reductions in the populations of many species inhabiting the Bay. Notable among these are the eastern oyster (*Crassostrea virginica*), blue crab (*Callinectes sapidus*), striped bass (*Morone saxatilis*), and several species of forage fish (CBP 2007). Other species, including weakfish (*Cynoscion regalis*), summer flounder (*Paralichthys dentatus*), and Atlantic croaker (*Micropogonias undulatus*), have been affected primarily by overfishing (McBride 2006). Steps to reduce fishing pressure, such as catch limits and moratoria, have contributed to population increases of some of these species (McBride 2006). The operation of proposed Unit 3 at the Calvert Cliffs site could also contribute to population declines by impinging, entrapping, or entraining species, but the effects would be minor relative to the existing Units 1 and 2, which operate using once-through cooling systems.

A significant issue facing the Chesapeake Bay is global climate change. The buildup of greenhouse gas emissions that occurred in the 20th century has assured that some climate change will occur within the 21st century, even without increasing the current rates of emissions (Teng et al. 2006). The projected climate changes are predicted to affect the Chesapeake Bay primarily through increasing sea level, air and water temperatures, and changes in precipitation (Jasinski and Claggett 2009). Increased water acidity, which is a looming issue in some ocean habitats (Doney et al. 2009), is considered a less important factor for the Chesapeake Bay at present (Jasinski and Claggett 2009). Wu et al. (2009) projected that the sea level at Solomons Island, about 7.5 mi south of CCNPP, is expected to rise by about 22 to 24 in. by the end of the 21st century. However, the estimate did not consider that the melting of the West Antarctic Ice Sheet could cause regional differences in sea level rise, which implies that the projection may have underestimated the rise in sea level in the Chesapeake Bay area by as much as one-third (Mitrovica et al. 2009). Najjar et al. (2009) projected that air temperatures in the Chesapeake Bay region could rise by about 5°F to 12°F by the year 2100. Because surface-water temperature is roughly related to air temperature, a similar increase in water temperature could be expected (Wood et al. 2002). Changes in rainfall are difficult to predict and model results often disagree. Most models predict, with considerable variability, that precipitation in winter and spring in the latter part of the 21st century could change an average of 3 percent over current levels (Najjar et al. 2009). One of the effects of increased precipitation is a reduction in salinity, particularly in the winter and spring (Jasinski and Claggett 2009).

The interaction of the operation of the proposed Unit 3 and the predicted rise in Bay water level is difficult to assess, but it is not likely that the plant's operations would add significantly to the potential impacts of sea-level rise (e.g., increased shoreline erosion). Similarly, the small sizes of the discharge plumes from Units 1 and 2 and proposed Unit 3 compared to the volume of water in the Chesapeake Bay suggests that the thermal discharges from all three units would not add importantly to the thermal regime in the Bay. Salinity in the Bay is predominantly related to flow from the Susquehanna River (Gibson and Najjar 2000), and the comparatively small discharges from all three units would not contribute to significant salinity changes in the Bay.

The review team concludes that the incremental contribution of construction and operation of Unit 3 on the Calvert Cliffs site to the cumulative effects on EFH and Federally managed fish and shellfish species in the Chesapeake Bay would be unlikely to noticeably alter populations.

7.0 Mitigation Measures

The primary factors that could affect EFH in the CCNPP Unit 3 project area would be construction activities, such as dredging for the barge dock restoration or pipeline installation and pile driving for the wedge-shaped pool and barge dock renovation. Increased water column turbidity is a primary effect from dredging. UniStar proposes to use methods such as turbidity curtains to reduce the potential turbidity impacts to aquatic resources in Chesapeake Bay (UniStar 2008d). This would include the use of turbidity curtains around dredges or active dredge areas. The State of Maryland, as a condition on granting a Certificate of Public Convenience and Necessity (CPCN), stipulated that UniStar conduct dredging at times of the year that are appropriate to avoid impacts to Natural Oyster Bar (NOB) 19-2, part of which is within the dredging area (MDNR PPRP 2008b).

Pile driving would be a relatively short-term activity with unavoidable adverse impacts. However, the extent of the adverse impacts is mitigable to some degree. UniStar has acknowledged that the effects of noise and vibrations could be reduced by various means, but has not committed to any for the proposed project at this time (UniStar 2008d). These could include placing bubble curtains around large piles and switching to hammers that produce less sound. Turbidity curtains would be used around pile driving areas to reduce the potential for increased water column sediment (UniStar 2008d). Buffered sound and less extensive sediment suspension would result in fewer adverse impacts on designated EFH and on Federally managed fish and shellfish species in the Chesapeake Bay.

There are also potential mitigation measures for operation of the proposed Unit 3 that may reduce adverse effects on designated EFH and on Federally managed fish and shellfish species in the Chesapeake Bay. Although the proposed new unit would include a fish-return system at the CWS intake, there is no proposed fish-return system at the UHS intake or at the entrance to the intake pipelines at the wedge-shaped pool. The UHS intake would not be operated often, so there would not be as great a need for a fish-return system at that location. However, the openings of the intake pipelines are the point of no return for many organisms as they are delivered into the common forebay. The trash racks at the pipe openings would prevent large organisms from being delivered to the common forebay. However, large organisms could be impinged on those trash racks. Any organisms smaller than the trash rack spacing (3.5 in.) likely would be drawn into the common forebay, where they would be subjected to entrainment, impingement, and/or entrapment. Installation of travelling screens and a fish-return system at the pipe openings in the wedge-shaped pool would reduce impingement and entrapment in the common forebay. In addition, to reduce effects of entrapment in the wedge-shaped pool and in the common forebay, a monitoring and rescuing program could be implemented to transfer such organisms back to the Bay. Such a program could include visual inspection, collection with nets or other devices, and delivery by a fish-return pipe or by direct transfer to the Bay in a location less likely to be affected by the intake area for Units 1, 2, and 3.

Although the NRC lacks the statutory authority to require any of the above potential mitigation measures, the staff recognizes that such potential mitigation could further reduce adverse impacts on designated EFH and on Federally managed fish and shellfish species in the Chesapeake Bay. The Corps permit, if issued, could include special conditions such as time-of-year restrictions or specific methods of work to ameliorate potential impacts to EFH for the authorized construction and maintenance dredging activities. EFH Conservation Recommendations necessary to protect EFH may also be included in the Corps DA permit. Mitigation may only be employed after all appropriate and practical steps to avoid and minimize adverse impacts to aquatic resources have been taken. All remaining unavoidable impacts must be compensated to the extent appropriate and practicable.

8.0 Conclusions

The potential impacts of the construction and operation of the proposed Unit 3 at the Calvert Cliffs site on Federally managed species and their designated EFH near the site have been evaluated. The known distributions and records of those species, the potential adverse impacts of the construction and operation to the species, their habitat, and their prey have been considered in this EFH assessment.

The disturbance created by the project, including sediment resuspension, would temporarily disturb EFH species in the area. Wave patterns and littoral drift patterns would be multi-directionally deflected and interrupted by the proposed structures and stone revetment. The proposed project would reduce the benefits and habitat that open water areas provide. However, motile species can move out of the project area during project construction and are expected to return following completion of the project. Benthic repopulation is expected to occur and benthic communities usually recover quickly from the impacts associated with similar projects, where depths dredged to bottom contours are not markedly different from pre-dredge depths. The overall effects of the dredging on the ecosystem and EFH are temporary, and the area proposed to be dredged would continue to be similar depth habitat. The proposed project area could either revert to current depths if maintenance dredging is not conducted through the years, or the waterway ecosystem would adjust to the depth change in the waterway and reach an equilibrium, providing habitat for those fish and wildlife communities that develop with the changes in the waterway.

Vessel traffic at the barge area is limited to the facility uses, and use of the channel may result in the discharge of small amounts of gas, oil, and grease from motors, as well as littering of the waterway with debris. It is expected that vessel traffic in the area and its associated pollution would increase due to improved access. The proposed depth increase would allow for larger vessels to navigate the waterway area, although access would be limited to vessels associated with the nuclear facility property. Increasing depths at the dredge site may reduce concentrations of dissolved oxygen available and reduce light penetration to the bottom, reducing photosynthesis opportunities. However, the proposed depths are similar to the existing waterway depths in the majority of the project area. Also, there is no SAV in the shallower depths closer to the shoreline.

Mechanical dredging uses a crane and bucket to excavate and transfer bottom sediments to a barge for transport to the disposal area. Some dredged material and water can be lost from the bucket as it is raised and deposited into the barge. The amount of material re-entering the water column as it is transferred from the barge to trucks is considered to be *de minimus*. The suspended sediment levels are also expected to return to normal when the off-loading activities are terminated. No toxic substances in toxic amounts are expected to be in the dredged material.

Water quality is expected to change. However, the alteration may not be considerably beneficial or detrimental. Dredging, structures, and stone revetment may not substantially improve water quality or offset other impacts to water quality. In general, the project and resultant uses may have impacts on water quality that may not be discernable from normal water quality fluctuations.

The primary effect of operation of the proposed Unit 3 on EFH would be the removal of water from the Bay and the associated entrainment, impingement, and entrapment of water-dwelling biota. Entrainment and impingement by the cooling water system of the proposed new unit would be much less than that generated by existing Units 1 and 2.

The NRC and the Corps have determined the construction and operation of the proposed Unit 3 at the Calvert Cliffs site would have more than minimal, although not substantial, adverse effect on EFH within the Chesapeake Bay by loss of spawning, nursery, forage, and/or shelter habitat for all of the nine species considered. The NRC lacks the statutory authority to require any mitigation measures that would minimize adverse effects on EFH. The Corps does not recommend any mitigative measures to minimize adverse effects on EFH at this time. This determination may be modified if additional information indicates otherwise and would change the preliminary determination.

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Biological Assessment

U.S. Fish and Wildlife Service

Calvert Cliffs Unit 3 Nuclear Power Plant

Calvert County, Maryland

U.S. Nuclear Regulatory Commission Combined License Application
Docket No. 52-016

U. S. Army Corps of Engineers Permit Application
Permit Application No. NAB-2007-08123-M05 (Calvert Cliffs 3 Nuclear Project, LLC/UniStar Nuclear Operating Services, LLC)

December 2010

U.S. Nuclear Regulatory Commission
Rockville, Maryland

U.S. Army Corps of Engineers
Baltimore District

1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (collectively referred to as UniStar or Applicant) for a combined license (COL) to construct and operate a new nuclear reactor with a design-rated gross electrical output of 1710 megawatts-electric (MW(e)) on the Calvert Cliffs site. The U.S. Army Corps of Engineers (Corps) is reviewing an application from UniStar for a Department of the Army (DA) Individual Permit pursuant to Section 10 of the Rivers and Harbors Appropriation Act of 1899 (Rivers and Harbors Act) and Section 404 of the Clean Water Act (33 U.S.C. 1344) to perform site preparation and construction activities for the proposed new unit at the Calvert Cliffs site. Currently, there are two operating nuclear reactors on the site, Calvert Cliffs Nuclear Power Plant (CCNPP) Units 1 and 2. The proposed new reactor – Unit 3 – would be located adjacent to the existing CCNPP Units 1 and 2. The site is located about 40 mi southeast of Washington, D.C., and 10.5 mi southeast of Prince Frederick, Maryland.

Pursuant to National Environmental Policy Act of 1969, as amended (NEPA), the NRC and the Corps are cooperating agencies with the NRC being the lead agency, and they prepared a draft environmental impact statement (EIS) as part of the agencies' reviews of the COL and DA Individual Permit applications. The Corps is cooperating with the NRC to ensure that the information presented in the EIS is adequate to fulfill the requirements of Corps regulations; the Clean Water Act Section 404(b)(1) Guidelines, which contain the substantive environmental criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S.; and the Corps public interest review process. As required by Title 10 of the Code of Federal Regulations (CFR) Part 51.26, the NRC published in the *Federal Register* a Notice of Intent (73 FR 8719) to prepare an EIS, to conduct scoping, and to publish a draft EIS for public comment. The NRC and Corps issued the draft EIS on April 16, 2010, and the NRC published a notice in the *Federal Register* on its availability (75 FR 20867). The draft EIS can be obtained on the NRC public website at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1936/ and through the NRC's Agencywide Document Management System (ADAMS) through the accession numbers ML101000012 and ML101000013. The final EIS will be published in February 2011. The impact analysis in the EIS includes an assessment of the potential environmental impacts of the construction and operation of a new nuclear power unit at the Calvert Cliffs site and along the associated transmission line corridors, including potential impacts to the threatened and endangered species. If issued, the COL would authorize UniStar to construct and operate the proposed unit. The Corps permit decision will be made following issuance of the final EIS.

The Corps and the NRC are conducting a joint consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended (ESA), and have prepared this biological assessment (BA), which examines the potential impacts of construction and operation of the proposed Unit 3 at the Calvert Cliffs site on threatened or endangered species. This BA examines the potential impacts of the proposed actions on Federally listed species within FWS's jurisdiction and focuses on two threatened species: the Puritan tiger beetle (*Cicindela puritana*) and the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). There are no areas designated as critical habitat near the Calvert Cliffs site.

2.0 Calvert Cliffs Site Description

The Calvert Cliffs site is located on the Chesapeake Bay about 60 mi south of Baltimore; 40 mi southeast of Washington, D.C.; 10.5 mi southeast of Prince Frederick, Maryland; and 7.5 mi north of Solomons, Maryland (Figure 1). The site comprises approximately 2070 ac adjacent to Chesapeake Bay in an unincorporated area of Calvert County, Maryland. Two existing nuclear generating units, CCNPP Units 1 and 2, which are licensed by the NRC, have a combined net electric generating capacity of approximately 1685 MW(e). Unit 1 began commercial operation in 1974, and Unit 2 began commercial operation in 1976. Together, the two existing nuclear units, auxiliary facilities, and onsite transmission line corridors occupy approximately 331 ac of the Calvert Cliffs site. A barge slip, two water intake structures, a single warmwater discharge to the Bay, and a fish-return system are currently onsite, along with associated security, fuel storage, and administrative buildings. Both of the existing units would remain and continue to operate, and they would not be affected by the proposed action.

Per the Chesapeake Bay Critical Area Act of 1984 (Maryland Code Annotated Natural Resources 8-18 2010), the State of Maryland and its Critical Area Commission for the Chesapeake and Atlantic Coastal Bays (CAC) established the Chesapeake Bay Critical Area (CBCA). This includes all land in Maryland within 1000 ft of the mean high water line of tidal waters or the landward edge of tidal wetlands, as well as all waters of and lands under the Chesapeake Bay and its tributaries (CAC 2008a). In addition, regulations that are implemented through local CBCA commissions establish protections for a 100-ft-wide, naturally vegetated, forested buffer landward from the mean high water line of tidal waters or from the edge of tidal wetlands and tributary streams of the Chesapeake Bay regardless of whether they actually occur within the CBCA (CAC 2008b). Within the Calvert Cliffs site both aforementioned listed tiger beetle species (Puritan tiger beetle and northeastern beach tiger beetle) only occur within the CBCA. Thus, any activities with the potential to affect either tiger beetle species would automatically be subject to CBCA restrictions.

In addition to eight different upland cover types, sandy beach and sand cliff habitats are found on the Chesapeake Bay shoreline where previous development has not occurred. Moderately broad, sandy beaches exist on the northern part of the site and on the adjacent Flag Ponds Nature Park. The southern section is dominated by the high cliffs that continue on the adjacent Calvert Cliffs State Park. The cliff face is mostly unvegetated and is preserved this way by wave action and erosion. The mostly narrow beach at the foot of the cliffs can be sandy to rocky.

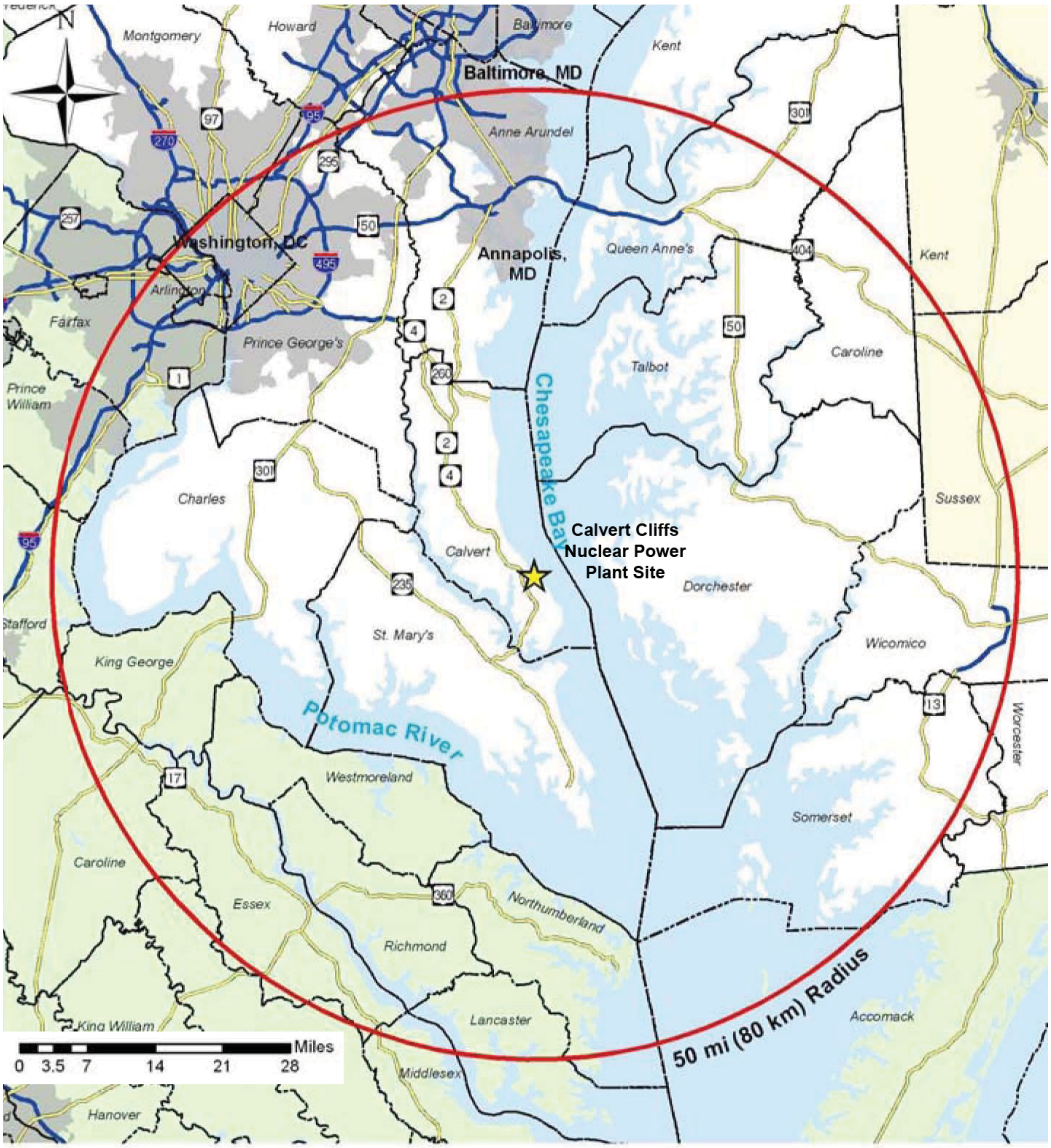

Figure 1. Location of the Calvert Cliffs Site, 50-mi Region (UniStar 2009c)

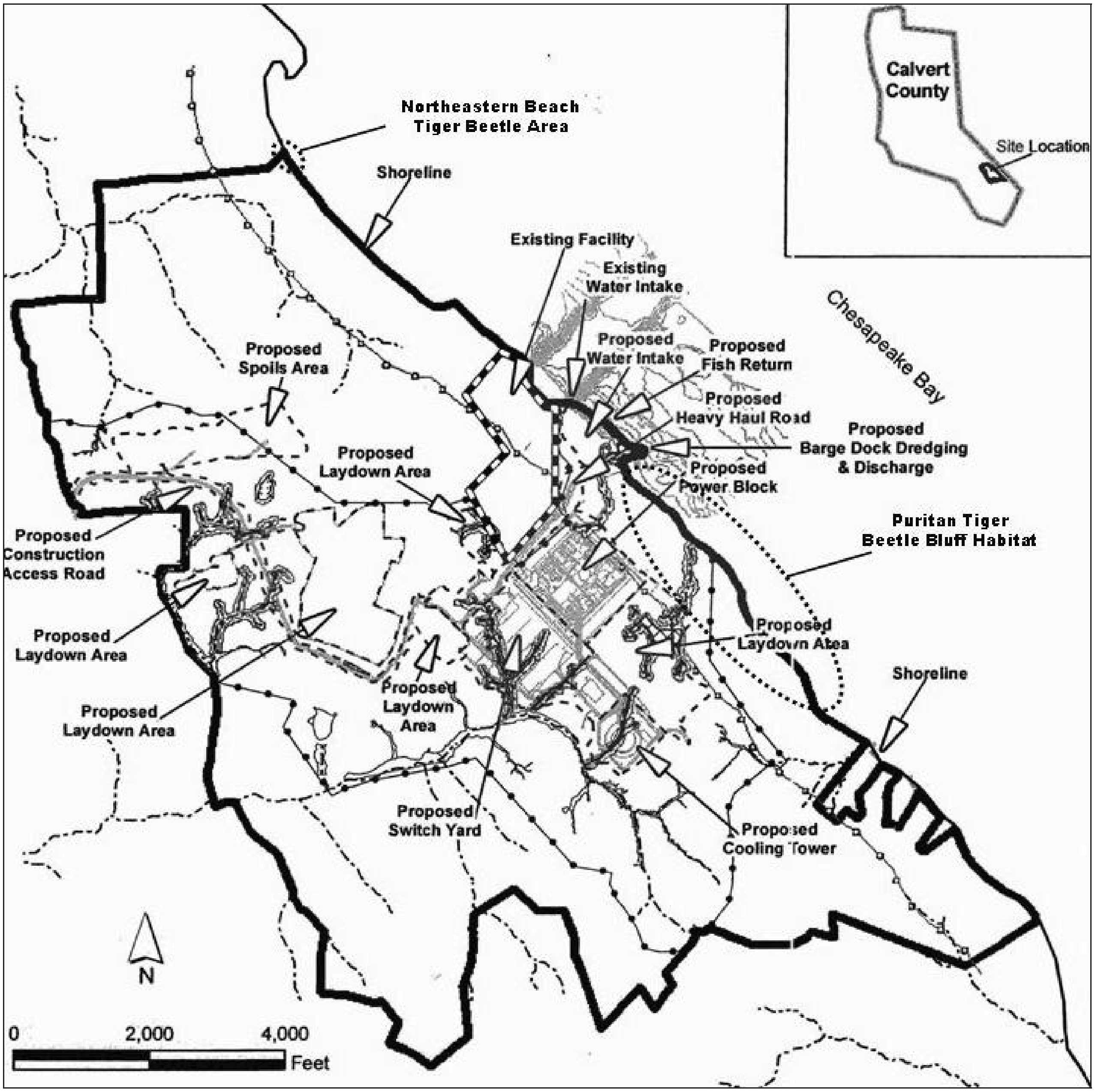

Figure 2. Locations of the Existing CCNPP Units 1 and 2 and the Proposed Location of Unit 3 Facilities (USACE 2008)

3.0 Proposed Federal Actions

This section provides information on the potential terrestrial impacts of construction activities and potential impacts related to the proposed Unit 3 at the Calvert Cliffs site. The proposed Federal actions are the issuance of a COL for the construction and operation of a new nuclear reactor at the Calvert Cliffs site pursuant to 10 CFR Part 52.97, and the decision regarding a DA Individual Permit application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The Corps action is the decision whether to issue a permit pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for proposed structures in and under navigable waters and the discharge of dredged, excavated, and/or fill material into waters of the United States, including jurisdictional wetlands.

The NRC, in a final rule dated October 9, 2007 (72 FR 57416), limited the definition of "construction" to those activities that fall within its regulatory authority in 10 CFR 51.4. Many of the activities required to construct a nuclear power plant are not part of the NRC action to license the plant. Activities associated with building the plant that are not within the purview of the NRC action are grouped under the term "preconstruction." Preconstruction activities include clearing and grading, excavating, erection of support buildings and transmission lines, and other associated activities. These preconstruction activities may take place before the application for a COL is submitted, during the NRC's staff's review of a COL application, or after a COL is granted. Although preconstruction activities are outside the NRC's regulatory authority, many of them are within the regulatory authority of local, State, or other Federal agencies. The distinction between construction and preconstruction is not carried forward in this BA and are being discussed together as construction activities.

Prerequisites to construction activities include, but are not limited to, documentation of existing site conditions within the Calvert Cliffs site and acquisition of the necessary permits (e.g., COL, local building permits, a National Pollutant Discharge Elimination System permit, a Clean Water Act Section 404 permit, a General Stormwater Permit, and other State and local permits). After these prerequisites are completed, planned construction activities could proceed and would include all or some of the activities pursuant to 10 CFR 50.10(e)(1). Following construction, planned operation of the new reactor would proceed according to 10 CFR 50.57.

The construction footprint for the proposed Unit 3 and all associated facilities would cover approximately 460 ac, including about 175 ac of previously disturbed ground. UniStar has proposed to build and operate an AREVA U.S. EPR design pressurized water reactor steam electric system, which is rated at 4590 megawatts-thermal MW(t) with a net of 1562 MW(e). Unit 3 would require cooling water intake and fish-return facilities that are separate from Units 1 and 2 and would also have a separate plant access road and protected area. The existing transmission system for CCNPP Units 1 and 2, which consists of two circuits, would be used to service Unit 3, and no new transmission corridors outside the construction footprint are planned.

Below is a description of the construction, operation, and related activities that could potentially affect the two Federally threatened tiger beetle species. The determination of potential effects was based on habitat affinities, life history considerations, and the nature, spatial, and temporal considerations of the activities.

3.1 Construction Activities

About 460 ac of terrestrial wildlife habitat would be disturbed during construction of proposed Unit 3. Approximately 265 ac of habitat, including 30 ac in the CBCA, would be affected. Activities that have the potential to affect tiger beetles include restoration and extension of an existing barge-unloading facility on the Chesapeake Bay shoreline, reconstruction of a culvert to restore a stream outfall near the barge dock, stream mitigation and stabilization at the mouth of a stream that meets the Chesapeake Bay immediately south of the barge dock area, and modification of land cover above the Chesapeake Bay bluffs.

To accommodate heavy equipment and reactor components that would be barged up the Chesapeake Bay to the existing barge dock on the Calvert Cliffs site, the slip would be refurbished, and the existing heavy haul road from the barge dock would be modified and extended to the proposed Unit 3 construction site and laydown areas. A new sheet-pile wall about 90-ft long would be installed between the barge slip and an existing outfall culvert. A bulkhead would be restored, and a concrete and riprap apron would be installed at the end of the haul road to allow off-loading. Construction of the heavy haul road to the barge dock and barge slip alterations may affect approximately 200 ft of sandy beach located immediately south of the existing barge slip. This particular locale was described as a wide sandy beach without adjacent bluffs and classified as non-habitat for both tiger beetle species (Knisley 2006). However, adult Puritan tiger beetles have been observed in this area. The sandy beach narrows and becomes rocky approximately 150 ft from the barge dock. Work activities on the beach would be restricted to occurring outside the June 1 to August 31 timeframe (UniStar 2010) to avoid affecting adult Puritan tiger beetles that may be present in the barge dock vicinity.

Reconstruction of a culvert to restore a stream outfall would also occur at the barge dock location. Silt build-up has altered the flow from this outfall, and a 40-ft by 40-ft by 2-ft deep riprap apron would be placed directly in front of the existing outfall (UniStar 2009a). This would allow the stream to flow directly into the Bay and avoid siltation of the barge dock area. UniStar has committed to a time-of-year work restriction for barge slip refurbishment activities that would occur landward of mean low water and extend up to the sheet pile bulkhead. Work on the beach would also be restricted within the June 1 to August 31 window (UniStar 2010).

The primary stream enhancement element at the mouth of a stream that flows from Camp Conoy is a channel stabilization feature at the confluence with Chesapeake Bay to prevent the upstream migration of a headcut. Woody riffle/pool grade controls and headwater wetland creation would be used to dissipate energy flow and lift the existing channel. A series of stone step pools would provide grade stability and connection to the Bay (UniStar 2010). Grading proposed on the banks above the step pools coupled with herbicide treatment should eliminate *Phragmites* and allow natural deposition at the cliff base, mimicking processes that create and maintain larval Puritan tiger beetle habitat. Since bare bluffs and narrow, sandy beach exist at this location, both beetles and their habitats have the potential to be disturbed in this locale. Therefore, activities at this area are subject to the same time-of-year restrictions, June 1 to August 31, and are also restricted to a 100-ft-wide corridor at the confluence of the stream with the Chesapeake Bay centered on the run of the stream (UniStar 2009b, 2010).

In addition, a building would be demolished and impervious surfaces removed at the Eagle’s Den located within 50 ft of the cliff face of the bluff that faces Chesapeake Bay and forest would be planted at this location. These bluffs below the Eagle’s Den serve as habitat for larval Puritan tiger beetles and were classified as good habitat during beetle surveys (Knisley 2009). Potential impacts include destabilization of the bluff face and subsequent alteration of the face and the beach below.

3.2 Operation

This section describes potential impacts to the protected beetles related to the operation of proposed Unit 3 and associated facilities at Calvert Cliffs site.

3.2.1 Shoreline Alteration from Water Withdrawal

The cooling water source for the proposed Unit 3 is the Chesapeake Bay. Total water demand from the Bay during normal operations would be 41,095 gpm, although consumptive rates would vary with temperature and humidity. Approximately one-half of this water would be lost to evaporation in the cooling tower, and the rest would be returned to the Bay. The impact of withdrawal from the Chesapeake Bay would be small. Additional shoreline exposure would not be measurable, especially in light of the natural erosive conditions at that location.

3.2.2 Maintenance Dredging and Restoration of the Barge Slip

Beyond refurbishment and restoration of the existing barge slip, maintenance dredging may be needed to transport large equipment, such as replacement steam generators. Nearshore maintenance dredging would occur as needed at the same location that barge slip refurbishment would occur during construction to remove accumulated material. Maintenance dredging activities could affect adult Puritan tiger beetles that may occur occasionally on the beach adjacent to the work area. UniStar has requested a 10-yr maintenance dredging clause be added to the DA Individual Permit, if issued.

4.0 Terrestrial Species Descriptions

Management of listed tiger beetles on the Calvert Cliffs site began when the Baltimore Gas and Electric Company, the prior operator of CCNPP Units 1 and 2, entered a conservation agreement with the Nature Conservancy that designated a Tiger Beetle Habitat Protection Area in 1993 (NRC 1999). Tiger beetle populations have been monitored within Calvert County annually since 1997 and on the Calvert Cliffs site, with the exceptions of 2001 and 2005 (Knisley 2009). Annual pedestrian surveys are conducted along Chesapeake Bay from late June to mid July when adult beetle populations are at their peak seasonally. All adults are counted at the water's edge where the beach is narrow, while wider beach sections are canvassed using a circuitous route. Waypoints are recorded to divide the beach into sections about 328 ft in length, and habitat attributes are noted. The remainder of this section describes the life history and habitat use of the two tiger beetle species that occur on and in the vicinity of the Calvert Cliffs site.

4.1 Puritan Tiger Beetle (*Cicindela puritana*)

Tiger beetles are typically the dominant invertebrate predators in the open sandy dunes and beaches that they inhabit (FWS 1993). The Puritan tiger beetle, measuring 11.5-12.4 mm in length, occurred historically on beaches in Connecticut, New Hampshire, and Massachusetts and along the shore of the Chesapeake Bay in Maryland (55 FR 32088). Recently, the Puritan tiger beetle's distribution has been drastically limited, with only three known locations: the Chesapeake Bay shoreline in Calvert County, around the mouth of the Sassafras River in eastern Maryland, and along the Connecticut River in Connecticut and Massachusetts (Figure 3) (FWS 1993). The largest of these populations, found in Calvert County, has declined in numbers since the early 1990s (Knisley 2006). There also appear to be wide fluctuations in numbers of adults observed at these sites from year to year.

The Puritan tiger beetle was Federally listed as threatened in 1990 due to its limited distribution coupled with threats from habitat loss and degradation, as well as vulnerability to natural and human threats (55 FR 32088). A more recent status review of this species recommended the Puritan tiger beetle be reclassified to endangered, but the listing has not changed to date (FWS 2007). It is also a State of Maryland endangered species (MDNR 2007).

The life cycle of *Cicindela puritana* takes up to 2 years to complete during which they transition through three larval instar stages. The adults emerge in June, and their numbers peak in late June through early July (FWS 1993; 55 FR 32088). Mating activities typically occur in the late afternoon, then the females move up to the adjacent cliff face to deposit their eggs (55 FR 32088). The larvae hatch in late July or August and remain as first instars for 2 to 4 weeks, then overwinter as second instars (FWS 1993). The following spring they molt into third instars and spend the summer and following winter in that stage (FWS 1993).

Puritan tiger beetle larvae in the Chesapeake Bay populations construct and inhabit deep burrows in sparsely vegetated or non-vegetated, sandy clay bluffs adjacent to the beaches where adults are found (FWS 1993; 55 FR 32088). The larvae tend to be most active during cool weather and especially in the fall as evidenced by observed open burrows (FWS 1993). The larvae are carnivorous and feed on small invertebrates that pass within reach of their burrows. They attach themselves to the lip of their burrows with hooks on their abdomen (FWS 1993). Adults exhibit some flexibility in beach habitat preference from wide sandy beaches to narrow beaches below clay banks (FWS 1993). Thus, important habitat is where the larvae inhabit the sparsely vegetated or non-vegetated, sandy clay bluffs adjacent to beaches.

Adults are active day and night and are prey for other predators, including robber flies and spiders, and larvae are parasitized by a wasp (*Methoca* sp.) (FWS 1993). The larval burrows are also susceptible to erosion and destruction from winter storms. However, the largest threat to the survival of these beetles is from loss and destruction of habitat required for larval survival from shoreline stabilization and development (FWS 1993). Natural erosion of cliffs by wave action and rainfall creates newly exposed habitat, suitable for oviposition and larval development, which is being destroyed by cliff stabilization structures such as the construction of bulkheads (55 FR 32088). Development often requires bank stabilization, and as banks are stabilized plant cover becomes established, reducing or eliminating suitable habitat and, thus, occupation by this beetle species (FWS 1993).

Most Puritan tiger beetles that occur along the Chesapeake Bay occur within Calvert County (Figure 3). On the Calvert Cliffs site, this habitat is found on the southern portion of the site only (Figure 2). Calvert County populations have fluctuated from over 9000 in 1988 and 1998 to less than 6000 in the past 3 years (Knisley 2006). Adult counts at the shoreline of the Calvert Cliffs site since 1997 have also fluctuated from a low of 49 in 1999 to a high of 616 in 1998, and the

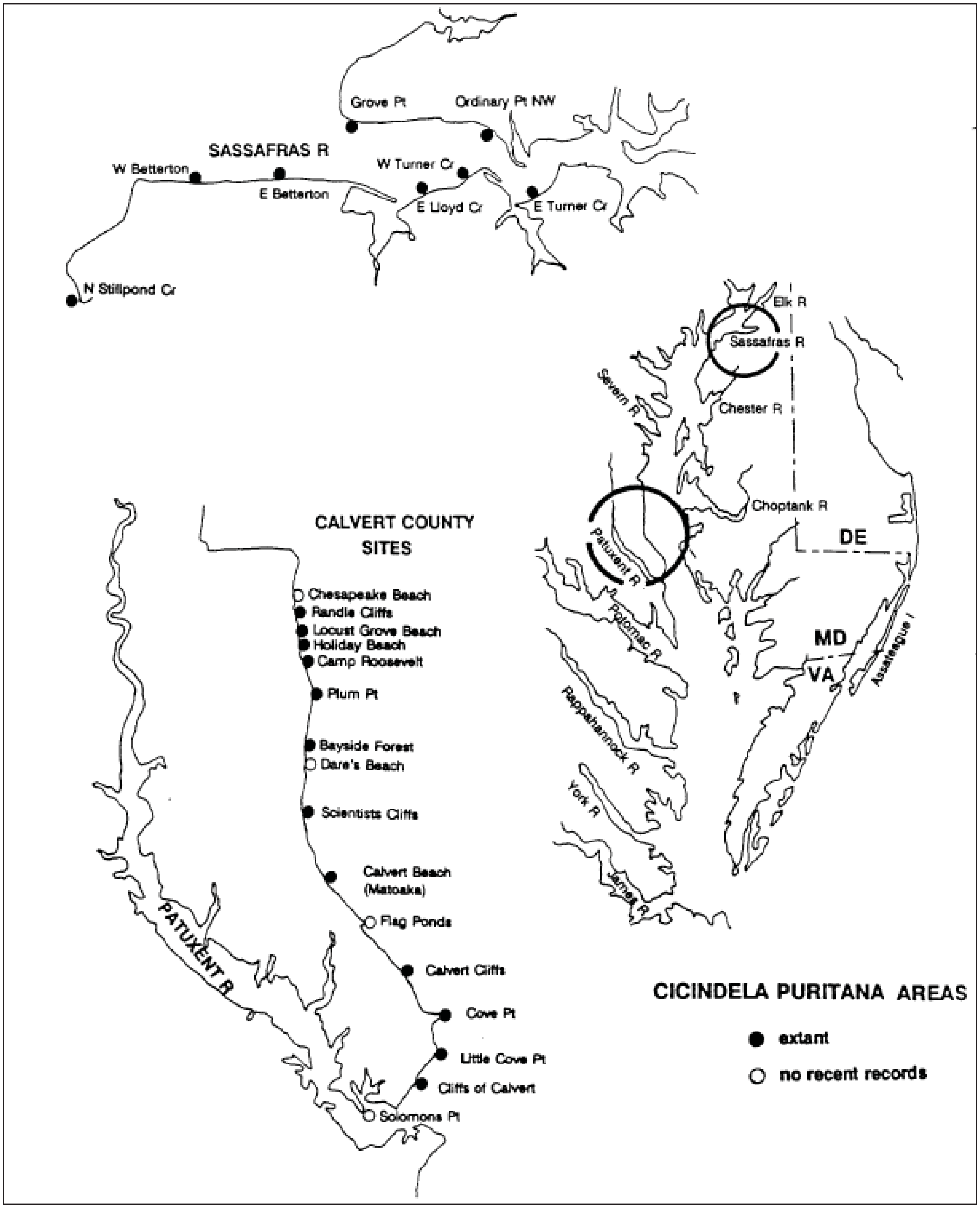

Figure 3. Distribution of the Puritan Tiger Beetle in the Chesapeake Bay Region (FWS 1993)

count was 122 in 2008 (Knisley 2009). Adult beetles were observed where beach habitat was suitable, with most observations occurring south of the barge dock (Figure 4).

4.2 Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*)

Like the Puritan tiger beetle, the northeastern beach tiger beetle is an important invertebrate predator. Its presence is an indication of a healthy beach community. Slightly larger than the Puritan tiger beetle at 13 to 15 mm in length (55 FR 32088), the northeastern beach tiger beetle inhabits dynamic beach environments closer to the water's edge (FWS 1994).

C. dorsalis dorsalis historically occurred from Cape Cod, Massachusetts, south to central New Jersey, and along the shores of the Chesapeake Bay in Virginia and Maryland (FWS 1994). Recently, the species has been extirpated from Rhode Island, Connecticut, Long Island, New York, and New Jersey. The current distribution is limited to two sites in coastal Massachusetts and throughout the Chesapeake shoreline (FWS 1994). Chesapeake Bay populations now constitute a significant portion of the known population of northeastern beach tiger beetles. The northeastern beach tiger beetle is a Federally threatened species and endangered in the State of Maryland (55 FR 32088; MDNR 2007), and a 5-year review of the status by the FWS is pending for this species (73 FR 3991).

Northeastern beach tiger beetles emerge as adults in early June through mid August, peaking in July (55 FR 32088). Adults are diurnally active on wider beach sections near the water's edge on warm, sunny days where they mate and lay their eggs from late June through August (FWS 1994). They preferably inhabit beaches at least 20 ft wide and move into new areas of deposition (Fenster et al. 2006). The adults feed mainly on small amphipods, arthropods, and flies, and have also been observed scavenging dead amphipods, crabs, and fish (FWS 1994).

The larval stages typically last through two winters with the first instar stage beginning in late July and August, and by September most of the larvae are second instars and remain active through November (FWS 1994; 55 FR 32088). Third instars from the previous summer's cohort are also active during the fall, and both cohorts then hibernate over the winter on the beach to around mid March (FWS 1994). The third instar larvae then emerge as adults while the newer cohort remains over the summer and following winter as third instars. However, if they hatch early and have an abundance of food, some can emerge as adults after only one winter (FWS 1994).

Northeastern beach tiger beetle larvae construct and inhabit burrows from which they ambush prey. Unlike Puritan tiger beetle larvae, northeastern beach tiger beetle larvae are found much lower on the beach in the upper intertidal to high-drift zone where prey is abundant (FWS 1994). Although burrows may be inundated at high tide, larvae have adapted by closing the burrow until water levels drop (FWS 1994). Unlike most other species of tiger beetles, the larvae of *C. dorsalis dorsalis* have been observed crawling on the beach, presumably relocating their burrows to more favorable area in response to changing conditions (FWS 1994). The larvae are susceptible to desiccation due to their lack of a hard cuticle and are, therefore, inactive during hot, dry periods (FWS 1994).

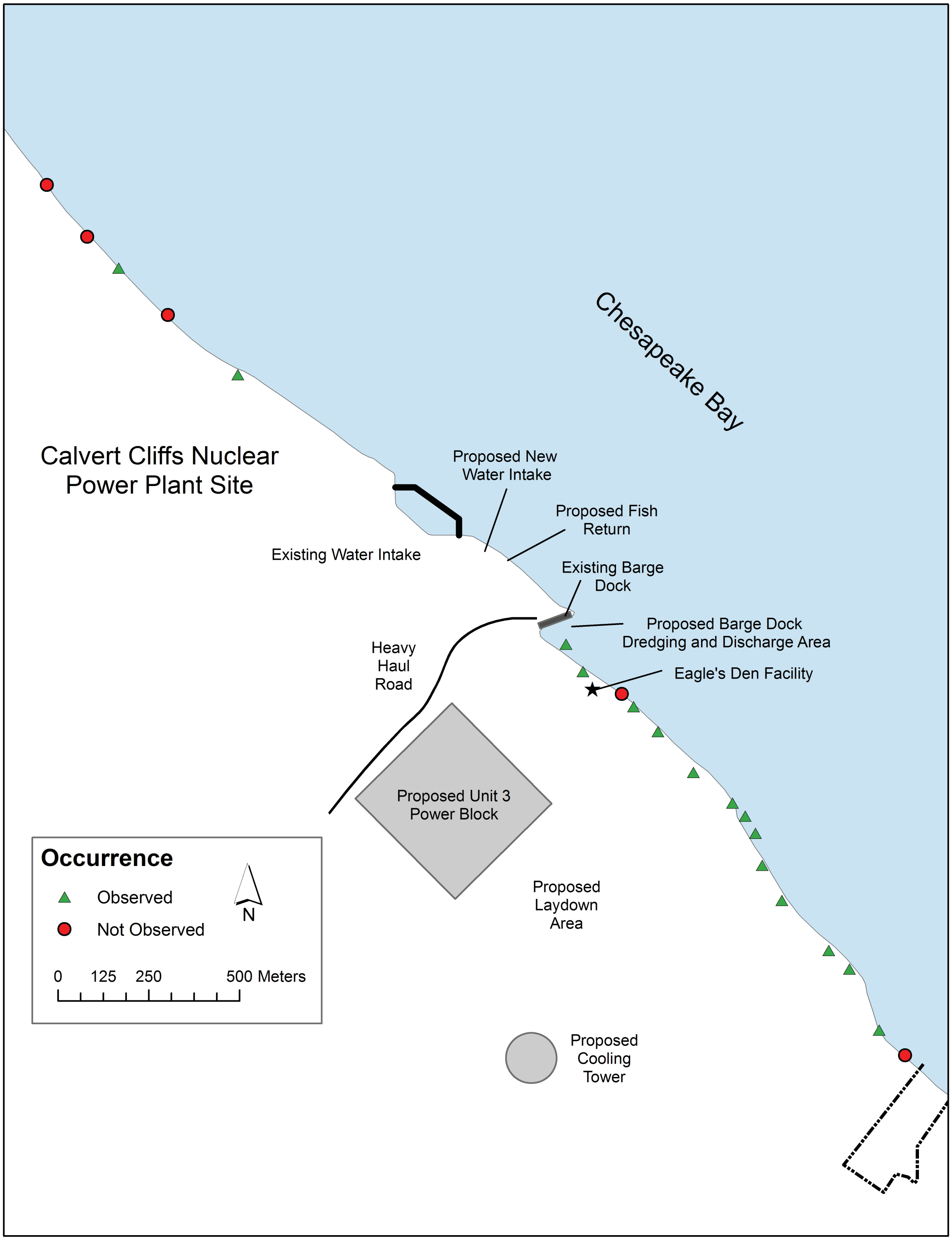

Figure 4. Proposed Facilities and Puritan Tiger Beetle Survey Results from 2006 (Adapted from USACE 2008; Knisley 2009)

Adults are preyed upon by birds, wolf spiders, and asilid flies (Fenster et al. 2006). The larvae are parasitized by an ant-like wasp (*Methocha* sp.) (FWS 1994), and they are also susceptible to erosion, flooding, and food availability. Larvae-to-adult survival may be as low as five percent. Causes for decline of this species have been attributed to beach habitat destruction and direct mortality from recreational use, alteration by stabilization structures, as well as natural phenomena (FWS 1994). The larvae are particularly vulnerable to compaction or destruction of their burrows by human use and vehicular traffic on the beaches where they develop (55 FR 32088).

Annual population levels of this species fluctuate widely, and local extinction and repopulation is likely a survival mechanism as adults are able to disperse widely. Marked individuals have been recovered 5-12 mi away, and some adults have been observed over 50 mi from known populations. Lack of undisturbed beaches and proximate populations are hampering recruitment despite the wide dispersal abilities of the adults (FWS 1994). Northeastern beach tiger beetles prefer large, wide, exposed beaches with fine grain size subject to natural erosion with little disturbance by humans (Fenster et al. 2006; 55 FR 32088).

Historically in Calvert County, northeastern beach tiger beetles have been confined to the northernmost 300-ft section of beach on the Calvert Cliffs site that borders Flag Ponds Natural Area. No known population of the northeastern beach tiger beetle is established within the Calvert Cliffs site, although individuals have been observed on the Calvert Cliffs site. In 2004, four adult northeastern beach tiger beetles were observed on the beach approximately 5000 ft northwest of the existing Calvert Cliffs water intake structure, but none were observed from 2006-2008 despite annual surveys (Knisley 2006; Knisley 2009). This location is the nearest known occurrence of this species to the proposed construction activity. No suitable breeding habitat, larvae, or burrows have been observed on the Calvert Cliffs site, and it is believed that this species does not have an established population on the site (Knisley 2006).

5.0 Adverse Environmental Impacts on Tiger Beetles

This section describes the potential impacts to the two Federally listed tiger beetle species resulting from construction and operation of a proposed third unit at the Calvert Cliffs site.

5.1 Puritan Tiger Beetle

Proposed construction activities with the potential to affect Puritan tiger beetles include refurbishment of the existing barge slip, restoration of a stream outfall immediately adjacent to the barge slip, stream enhancement at the mouth of a stream that flows from Camp Conoy, and removal of the Eagle's Den facilities.

Barge slip modification and construction of a heavy haul road to the barge dock would affect a small, sandy beach immediately south of the existing barge slip. The beach was described as wide and sandy without adjacent cliffs and classified as non-habitat for Puritan tiger beetles (Knisley 2006). However, this qualitative habitat grading scale is based on bluff suitability for larvae. Adults can and do occasionally occur in beach segments classified as non-habitat or marginally suitable habitat. Approximately 150 ft south of the barge slip the beach narrows and becomes rocky, also not ideal habitat. Although habitat for larval Puritan tiger beetles does not exist at this location, adult Puritan tiger beetles have been observed on the beach during 2004, 2006, and 2007 within approximately 300-600 ft of the existing barge dock (Figure 4) (Knisley 2006; UniStar 2009a, 2010). The maximum number observed during a single visit was six individuals (Knisley 2006). Adult Puritan tiger beetles are active during the summer, and UniStar has committed to a time-of-year work restriction for barge slip refurbishment activities that would occur on the beach. No work activities would be allowed on the beach from June 1 to August 31, inclusive of any year (UniStar 2009b, 2010).

Stream stabilization at the mouth of a stream that flows from Camp Conoy that empties into Chesapeake Bay could also affect Puritan tiger beetles. Bluffs that are suitable for Puritan tiger beetle larvae are located within 25-50 ft of the stream outlet. Proposed construction activity would be strictly limited to a 100-ft section of beach centered on the stream outlet and is not expected to affect this habitat (UniStar 2009b, 2010). Vehicles and equipment staged on the beach adjacent to the stream outlet could also affect adult Puritan tiger beetles. No work is proposed below the approximate mean high water shoreline of the Chesapeake Bay. As with the barge slip refurbishment, no vehicle staging related to the headcut or other mitigation activities at this location would be conducted from June 1 to August 31 (UniStar 2009b, 2010; EA Engineering 2009). UniStar agreed to control and monitor all construction access, logistics, and staging to ensure strict adherence to all temporal and spatial work restrictions (UniStar 2010).

The other construction activities with the potential to affect the Puritan tiger beetle are the demolition of the building and removal of impervious surfaces at the Eagle's Den area and reforestation to be conducted at the immediate top of the bluff that faces Chesapeake Bay. The cliff face is where Puritan tiger beetle larvae live (Knisley 2006). The beach immediately below the Eagle's Den is mapped as optimal tiger beetle habitat but is also described as rocky and poorly suited (Knisley 2006). A geotechnical evaluation would be conducted to determine stability of the Eagle's Den area and used to determine appropriate construction loads and methods to avoid disturbance of the bluff (UniStar 2009c). Sediment and erosion control BMPs would also be used to minimize impacts to adjacent beetle habitat (UniStar 2009a).

Beach habitat would not be measurably altered by the proposed Unit 3 use of water from the Chesapeake Bay to operate the closed-cycle cooling system. Tiger beetles, as well as other fauna and flora residing along the Chesapeake Bay shoreline, would likely be unaffected. However, maintenance dredging during operation could reduce the amount of beach adjacent to the barge slip if conducted from land and could affect individual adult Puritan tiger beetles on the beach during work activities. However, only a few individuals have been occasionally observed nearby, and if the work is conducted outside the June 1 to August 31 period, tiger beetles should not be affected. Occasional use of the barge dock during operation is not expected to affect Puritan tiger beetles since the barge dock and the area in the immediate vicinity do not provide suitable habitat. Therefore, proposed Unit 3 construction and operation activities could affect a small number of Puritan tiger beetles.

5.2 Northeastern Beach Tiger Beetle

Proposed construction and mitigation activities would not take place within approximately one mile of where northeastern beach tiger beetle adults have been observed on the Calvert Cliffs site. Even though individuals of the northeastern beach tiger beetle have been found up to several miles from known populations, construction and mitigation activities are not expected to affect the population located at the northern tip of the CCNPP site (Figure 2). Operation of Unit 3 is also not expected to affect this species because there are no known activities that would occur near the known population during operation located at the CCNPP site. Therefore, adverse impacts to northeastern beach tiger beetles from the construction and operation of the proposed Unit 3 are not expected to occur.

6.0 Cumulative Impacts

The NRC and the Corps review team considered potential past, present, and reasonably foreseeable activities that could have cumulative effects on Federally protected species in conjunction with building and operating a new nuclear unit at the Calvert Cliffs site. For this analysis, cumulative effects include the effects of State, tribal, local, and private actions in the vicinity of the Calvert Cliffs site. Future Federal actions that are not related to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the ESA (FWS and NMFS 1998). The future is defined as the start of construction of the proposed Unit 3 until the conclusion of decommissioning, and the area of interest is the Chesapeake Bay shoreline within Calvert County.

Projects and activities within the vicinity of the Calvert Cliffs site with the potential to affect either tiger beetle species include power upgrades and continued operation of CCNPP Units 1 and 2, the Dominion Cove Point pier reinforcement project, Mid-Atlantic Power Pathway (MAPP) transmission line project, continued existence of Flag Ponds Nature Park and Calvert Cliffs State Park, regional urban development, and global climate change.

Power upgrades and the continued operation of Units 1 and 2 would require periodic maintenance dredging of the existing barge dock. Currently Units 1 and 2 do not have a permit from the Corps to conduct maintenance dredging, but the current DA Individual Permit application requests the approval of maintenance dredging for a 10-yr period. Puritan tiger beetles have been observed nearby, and this activity could displace individual adults using the nearby beach if maintenance dredging occurs near the shore and during the season adult beetles are active.

Near the Cove Point Liquid Natural Gas (LNG) facility, Puritan tiger beetles historically occurred at four locations: the Calvert Cliffs site (3.5 mi from the LNG facility), Cove Point (1 mi), Little Cove Point (2.5 mi), and the Cliffs of Calvert (over 4 mi) (FWS 1993). Both small and large populations of the northeastern beach tiger beetle were also found at Cove Point as well as at Flag Ponds Nature Park just north of the Calvert Cliffs site (FWS 1994). Activities with the potential to affect either tiger beetle species include dredging and infrastructure installation and upgrades. The existing LNG facility consists of a dock for unloading LNG and storage and distribution facilities. The dock is approximately 1 mi offshore. Pipelines that connect to the storage facility appear to be subsurface, with the nearest above-ground structure about 0.15 mi from any beach habitat that may be suitable for either beetle species. Pier reinforcement activities would occur at the offshore pier and are not expected to affect shoreline habitats, and any upgrades to the storage facility would occur inland at sufficient distances to preclude impacts to shoreline habitats. No Puritan tiger beetles have been observed in the Cove Point vicinity affected by this project, and the FWS concluded project activities would not affect this species. The conversion of nearshore and beach habitat to marsh from LNG pier reinforcement mitigation activities could affect northeastern beach tiger beetle habitat. However, Cove Point beach habitat where northeastern tiger beetles have been observed has degraded naturally, and the beetle population has declined. The FWS concluded that the absence of adult northeastern beach tiger beetles and suitable larval habitat would result in no adverse affect on this species (USACE 2010).

The MAPP project includes the installation of a submarine 500-kV transmission line from the Calvert Cliffs site to Indian River power plant near Millsboro, Delaware, and would cross the Chesapeake Bay from the Calvert Cliffs site. It is not known exactly where or how the transmission line would be installed at the shoreline. Neither beetle species is known to occur along much of the shoreline within the central part of the Calvert Cliffs site; therefore, if the MAPP project connects to the central portion of the site, no impacts to either species would be anticipated because suitable habitat is not present at that location.

Urban development along the Chesapeake Bay shoreline has occurred and is expected to continue. Beaches may provide ideal building sites, and recreational access to beaches may increase with the local population. Disturbance of these habitats may also allow the establishment of non-native plant species, possibly resulting in habitat loss or degradation. Listed beetle populations on lands already protected from development, such as Calvert Cliffs State Park and Flag Ponds Nature Park would not likely be threatened by urban development. The Chesapeake Bay Critical Area Commission could limit the extent, location, and potential adverse affects by managing future development within suitable Puritan and northeastern beach tiger beetle habitat. Although habitat may be somewhat secure from immediate development, public recreation that occurs on beaches of Chesapeake Bay, including the Flag Ponds Nature Park, could affect the northeastern beach tiger beetle and the Puritan tiger beetle.

Global warming and sea level rise are not likely to affect the Chesapeake Bay shoreline that provides both tiger beetle species with habitat. Puritan tiger beetle adults occupy narrow beaches below the steep bluffs. The bluffs and narrow beaches are maintained as suitable habitat by wave action, and a change in sea level is not expected to affect wave action and the maintenance of the Puritan tiger beetle habitat. Northeastern tiger beetles occupy broad, sandy beaches and are not expected to be affected as sea level rise would likely be accompanied by shifting beaches.

Habitat loss and degradation along the shores of the Chesapeake Bay threaten both the Puritan and the northeastern beach tiger beetles. Residential and industrial development and beach recreation are the main causes. Some habitats are afforded protection from development, and development could be managed by the CBCA Commission.

7.0 Conclusion

The potential impacts of the construction and operation of the proposed Unit 3 at the Calvert Cliffs site on Federally protected species near the site have been evaluated. The known distributions and records of those species and the potential ecological impacts of the construction and operation of Unit 3 to the species and their habitats have been considered in this BA.

Based on this review, the NRC and Corps review team concludes that the construction and operation of proposed Unit 3 at the Calvert Cliffs site may affect a small number of adult Puritan tiger beetles but are not likely to adversely affect or jeopardize the continued existence of the Puritan tiger beetle on the site. Also based on this review, the staff concludes that the construction and operation of Calvert Cliffs Unit 3 are not likely to adversely affect or jeopardize the continued existence of the northeastern beach tiger beetle because the project activities would not occur in close proximity to the nearest northeastern beach tiger beetle.

8.0 References

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Appendix G

Supporting Documentation on Radiological Dose Assessment

Appendix G

Supporting Documentation on Radiological Dose Assessment

The U.S. Nuclear Regulatory Commission (NRC) staff performed an independent dose assessment of the radiological impacts resulting from normal operation of the new and existing nuclear units at and near the Calvert Cliffs Nuclear Power Plant (CCNPP). The results of this assessment are presented in this appendix and are compared to the results from UniStar found in Section 5.9 of this environmental impact statement (EIS), Radiological Impacts of Normal Operations. The appendix is divided into four sections: (1) dose estimates to the public from liquid effluents, (2) dose estimates to the public from gaseous effluents, (3) cumulative dose estimates, and (4) dose estimates to the biota from liquid and gaseous effluents.

G.1 Dose Estimates to the Public from Liquid Effluents

The staff used the dose assessment approach specified in Regulatory Guide 1.109 (NRC 1977) and the LADTAP II computer code (Strenge et al. 1986) to estimate doses to the maximally exposed individual (MEI) and population from the liquid effluent pathway of the proposed Unit 3. The staff used the annual radioactive effluent release reports for the years 2000 to 2009 to estimate doses to the MEI and population from liquid effluent releases from the existing CCNPP units (Constellation 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010).

G.1.1 Scope

Doses from the proposed Unit 3 to the MEI were calculated and compared to regulatory criteria for the following:

- Total Body – Dose was the total for all pathways (i.e., drinking water, fish and shellfish consumption, shoreline usage, swimming exposure, boating) with the highest value for either the adult, teen, child, or infant compared to the 0.03 mSv/yr (3 mrem/yr) per reactor dose design objective in Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix I.

- Organ – Dose was the total for each organ for all pathways (i.e., drinking water, fish and shellfish consumption, shoreline usage, swimming exposure, boating) with the highest value for either the adult, teen, child, or infant compared to the 0.1 mSv/yr (10 mrem/yr) per reactor dose design objective specified in 10 CFR Part 50, Appendix I.

The NRC staff reviewed the exposure pathways and the input parameters and values used by UniStar in its Environment Report (ER) (2009) for appropriateness, including references made to the AREVA NP, Inc. (AREVA) U.S. EPR design certification document (AREVA 2007). Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available from UniStar. The staff concluded that the assumed exposure pathways were conservative in that the Chesapeake Bay is not a source for irrigation or offsite drinking water (except for ship borne desalination facilities).

G.1.2 Resources Used

To calculate doses to the public from liquid effluents, the staff used a personal computer version of the LADTAP II code entitled NRCDOSE, Version 2.3.10 (Chesapeake Nuclear Services, Inc. 2008) obtained through the Oak Ridge Radiation Safety Information Computational Center (RSICC).

G.1.3 Input Parameters

Table G-1 provides a listing of the major parameters used in calculating dose to the public from liquid effluent releases during normal operation.

G.1.4 Comparison of Results

Table G-2 presents a comparison of UniStar's results for a single new unit with those determined by the staff. Doses calculated for the MEI and population were the same as those developed by UniStar.

For calculating the population dose from liquid effluents, the population distribution used by UniStar was for year 2080, 10 years beyond the anticipated operating license. However, Environmental Standard Review Plan (ESRP) Section 5.4.1 (NRC 2000) instructs the NRC staff to use the "...projected population for 5 years from the time of the licensing action under consideration." Assuming the combined license (COL) licensing action occurs in year 2010 and adding 5 years yields year 2015, so the NRC staff considered using the population for 2015 in its analysis. Using the population projections from ER Table 2.5-10 (UniStar 2010) (summarized in Table G-3) yields a population estimate for the year 2015 of 3,853,907. This is significantly smaller than the 2080 projected population (6,418,570), so the doses calculated by UniStar are conservatively high. For comparability, the NRC staff also used 2080 population. Doses for the year 2015 would be a factor of 1.7 less than those reported below.

The staff concurs with the conclusion documented in the ER that the peak MEI and population doses from the existing unit liquid effluent pathway during the period 2002 to 2009 occurred in year 2002. The NRC staff reviewed the annual radioactive effluent release reports for the years 2002 to 2009 (Constellation 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010) to find the peak occurred in year 2002. The staff's review of the 2002 annual report (Constellation 2003) yielded results equivalent to those reported in Tables 4.5-2 and 5.4-14 of UniStar's ER (UniStar 2010).

Table G-1. Parameters Used in Calculating Dose to the Public from Liquid Effluent Releases

Parameter	Staff Value		Comments
New unit liquid effluent source term (Ci/yr)[(a)]	H-3	1.66×10^{3}	Values from AREVA U.S. EPR Design Control Document Table 11.2-4 for a single unit (AREVA 2007). These values are the same as those reported in ER Table 3.5-7 (UniStar 2009).
	Na-24	6.10×10^{-3}	
	Cr-51	1.00×10^{-3}	
	Mn-54	5.40×10^{-4}	
	Fe-55	4.10×10^{-4}	
	Fe-59	1.00×10^{-4}	
	Co-58	1.50×10^{-3}	
	Co-60	1.80×10^{-4}	
	Zn-65	1.70×10^{-4}	
	W-187	4.60×10^{-4}	
	Np-239	5.80×10^{-4}	
	Sr-89	5.00×10^{-5}	
	Sr-91	8.00×10^{-5}	
	Y-91m	5.00×10^{-5}	
	Y-93	3.60×10^{-4}	
	Zr-95	1.30×10^{-4}	
	Nb-95	1.00×10^{-4}	
	Mo-99	1.80×10^{-3}	
	Tc-99m	1.70×10^{-3}	
	Ru-103	2.50×10^{-3}	
	Ru-106	3.10×10^{-2}	
	Ag-110m	4.40×10^{-4}	
	Te-129m	6.00×10^{-5}	
	Te-129	4.00×10^{-5}	
	Te-131m	3.10×10^{-4}	
	Te-131	6.00×10^{-5}	
	I-131	3.40×10^{-2}	
	Te-132	4.80×10^{-4}	
	I-132	1.20×10^{-3}	
	I-133	3.50×10^{-2}	
	Cs-134	2.60×10^{-3}	
	I-135	1.50×10^{-2}	
	Cs-136	3.10×10^{-4}	
	Cs-137	3.50×10^{-3}	
	Ba-140	4.20×10^{-3}	
	La-140	7.60×10^{-3}	
	Ce-141	5.00×10^{-5}	
	Ce-143	6.10×10^{-4}	
	Ce-144	1.30×10^{-3}	
	Pr-144	1.30×10^{-3}	

Table G-1. (contd)

Parameter	Staff Value	Comments
Discharge flow rate (ft^3/s)	46.8	Site-specific value of 21,109 gpm from Table 5.4-1 of the ER (UniStar 2010).
Source term multiplier	1	Single-unit source term.
Site type	Saltwater	Discharge is to the saltwater Chesapeake Bay.
Reconcentration model	No impoundment	
Impoundment total volume (ft^3)	0	Set to zero for "no impoundment" model (Strenge et al. 1986).
Shore width factor	1.0	Suggested value for tidal basin (NRC 1977; Strenge et al. 1986; UniStar 2009).
Dilution factors for aquatic food and boating, shoreline and swimming, and drinking water	296	Site-specific value from Table 5.4-1 of the ER (UniStar 2010).
Transit time (hr)	0	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Consumption and usage factors for adults, teens, children, and infants	Shoreline and Boating usage (hr/yr) 200 (adult) 200 (teen) 200 (child) 200 (infant) Swimming usage (hr/yr) 100 (adult) 100 (teen) 100 (child) 100 (infant)	Site-specific values from Table 5.4-2 of the ER (UniStar 2009) and LADTAP II code default values (NRC 1977; Strenge et al. 1986).
	Drinking water usage (L/yr) 730 (adult) 510 (teen) 510 (child) 330 (infant) Fish consumption (kg/yr) 21 (adult) 16 (teen) 6.9 (child) 0 (infant)	MEI drinking water assumes water is desalinated by shipborne water treatment facilities.
Total 50-mi population	6,418,570	Site-specific value from Table 2.5-10 of the ER (UniStar 2010|.
Total 50-mi sport fishing harvest (kg/yr)	1,290,000	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).

Table G-1. (contd)

Parameter	Staff Value	Comments
Total 50-mi sport invertebrate harvest (kg/yr)	1,580,000	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Total 50-mi commercial fishing harvest (kg/yr)	152,200,000	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Total 50-mi commercial invertebrate harvest (kg/yr)	26,400,000	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Total 50-mi shoreline usage (person-hr/yr)	37,843,909	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Total 50-mi swimming usage (person-hr/yr)	30,133,372	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).
Total 50-mi boating usage (person-hr/yr)	44,285,377	Site-specific value from Table 5.4-1 of the ER (UniStar 2009).

(a) Only radionuclides included in Regulatory Guide 1.109 are considered (NRC 1977).

Table G-2. Comparison of Doses to the Public from Liquid Effluent Releases for a New Unit

Type of Dose[a]	UniStar ER (2010)[a]	Staff Calculation
Total Body (mrem/yr)	0.013 (adult)	0.013 (adult)
Organ Dose (mrem/yr)	0.077 (adult GI-LLI)	0.077 (adult GI-LLI)
Thyroid (mrem/yr)	0.068 (child)	0.068 (child)
Population dose from liquid pathway (person-rem/yr)	0.17	0.17

(a) Results from UniStar ER Tables 5.4-7, 5.4-8 and 5.4-10 (UniStar 2010).

Table G-3. Population Projections from 2000 to 2080 Within 50 mi of the Calvert Cliffs Site

	Population Projections within Radii/Distances mi						Annual Average Percent Change for the 10-Year Period
Year	**0 to 10 mi [a]**	**10 to 20 mi**	**20 to 30 mi**	**30 to 40 mi**	**40 to 50 mi**	**0 to 50 mi [d]**	
2000[b]	48,755	112,841	162,006	618,907	2,267,761	3,202,260	NA
2010[c]	46,272	128,170	183,991	703,086	2,576,246	3,637,765	1.36%
2015[c]	49,031	135,788	194,909	744,798	2,729,381	3,853,907	NA
2020[c]	51,126	141,542	203,279	776,201	2,843,806	4,015,954	1.04%
2030[c]	55,256	152,988	219,647	839,208	3,075,213	4,342,312	0.81%
2040[c]	61,716	170,849	245,359	936,915	3,432,515	4,847,354	1.160%
2050[c]	66,723	184,811	265,321	1,013,675	3,714.072	5,244,602	0.82%
2060[c]	71,781	198,759	285,436	1,090,176	3,994,214	5,640,366	0.75%
2080[e]	81.633	226,166	324,618	1,240,436	4,545,717	6,418,570	0.62%

Source: UniStar 2010, Table 2.5-9.
(a) Population estimates and projections include transient and residential population in the 0 to 10 mi range.
(b) Residential population in 2000, U.S. Census Bureau, Decennial Census (UniStar 2010).
(c) The populations for years 2010 through 2060 have been projected by calculating a growth rate using state population projections (by county) as the base.
(d) Transient population is only included in the 0 to 10 mi distribution.
(e) Population used in GASPAR II Population runs (UniStar 2010).

G.2 Dose Estimates to the Public from Gaseous Effluents

The NRC staff used the dose assessment approach specified in Regulatory Guide 1.109 (NRC 1977) and the GASPAR II computer code (Strenge et al. 1987) to estimate doses to the MEI and to the population within a 50-mi radius of the proposed Unit 3 site from the gaseous effluent pathway for both the proposed and existing units.

G.2.1 Scope

The staff and UniStar calculated the maximum gamma air dose, beta air dose, total body dose, and skin dose from noble gases at the exclusion area boundary location 0.88 mi SE of the proposed Unit 3 site. Dose to the MEI was calculated at 0.88 mi SE of the site for plume immersion, inhalation, and ingestion of locally produced beef at 0.86 mi S of the site for direct shine from deposited radionuclides and at 0.98 mi SE of the site for the ingestion of local garden vegetables. The milk ingestion pathway is not considered because there are no known milk cows within 5 mi of the Unit 3 site (UniStar 2010).

The staff reviewed the input parameters and values used by UniStar (2010) for appropriateness, including references made to the AREVA U.S. EPR design control document (2007). Default values from Regulatory Guide 1.109 (NRC 1977) were used when input parameters were not available. The staff concluded that the assumed exposure pathways and input parameters and values used by UniStar were appropriate. These pathways and parameters were used by the staff in its independent calculations using GASPAR II.

Joint frequency distribution data of wind speed and wind direction by atmospheric stability class for the Unit 3 site provided in Table 2.7-42 of the ER (UniStar 2010) were used as input to the XOQDOQ code (Sagendorf et al. 1982) to calculate long-term average χ/Q and D/Q values for routine releases. The staff's independent results compare favorably to those reported in ER Tables 2.7-101 to 2.7-104 (UniStar 2010).

Population doses were calculated for all types of releases (e.g., noble gases, iodines and particulates, and H-3 and C-14) using the GASPAR II code for the following exposure pathways: plume immersion, direct shine from deposited radionuclides, ingestion of vegetables, and ingestion of milk and meat.

G.2.2 Resources Used

To calculate doses to the public from gaseous effluents, the staff used a personal computer version of the XOQDOQ and GASPAR II codes entitled NRCDOSE Version 2.3.10 (Chesapeake Nuclear Services, Inc. 2008) obtained through the Oak Ridge RSICC.

G.2.3 Input Parameters

Table G-4 provides a listing of the major parameters used in calculating dose to the public from gaseous effluent releases during normal operation.

Table G-4. Parameters Used in Calculating Dose to Public from Gaseous Effluent Releases

Parameter	Staff Value		Comments
New unit gaseous effluent source term (Ci/yr)[(a)]	Ar-41	3.4×10^{1}	Values from AREVA U.S. EPR Design Control Document Table 11.3--3 (AREVA 2007). Except for rounding differences, these values are the same as those reported in ER Table 3.5-8 (UniStar 2009).
	Kr-85m	1.6×10^{2}	
	Kr-85	3.4×10^{4}	
	Kr-87	5.6×10^{1}	
	Kr-88	1.9×10^{2}	
	Xe-131m	3.5×10^{3}	
	Xe-133m	1.9×10^{2}	
	Xe-133	8.6×10^{3}	
	Xe-135m	1.5×10^{1}	
	Xe-135	1.2×10^{3}	
	Xe-138	1.2×10^{1}	
	I-131	8.8×10^{-3}	
	I-133	3.2×10^{-2}	
	H-3	1.8×10^{2}	
	C-14	7.3×10^{0}	
	Cr-51	9.7×10^{-5}	
	Mn-54	5.7×10^{-5}	
	Co-57	8.2×10^{-6}	
	Co-58	4.8×10^{-4}	
	Co-60	1.1×10^{-4}	
	Fe-59	2.8×10^{-5}	
	Sr-89	1.6×10^{-4}	
	Sr-90	6.3×10^{-5}	
	Zr-95	1.0×10^{-5}	
	Nb-95	4.2×10^{-5}	
	Ru-103	1.7×10^{-5}	
	Ru-106	7.8×10^{-7}	
	Sb-125	6.1×10^{-7}	
	Cs-134	4.8×10^{-5}	
	Cs-136	3.3×10^{-5}	
	Cs-137	9.0×10^{-5}	
	Ba-140	4.2×10^{-6}	
	Ce-141	1.3×10^{-5}	

Table G-4. (contd)

Parameter	Staff Value		Comments
Existing Units 1 and 2 gaseous effluent source term (Ci/yr)[(a)]	H-3 Ar-41 Co-58 Co-60 Kr-85m Kr-85 Sr-89 Sr-90 Xe-131m Xe-133m Xe-133 Xe-135 I-133 I-131	$4.79 \times 10^{+0}$ 2.72×10^{-3} 8.99×10^{-6} 7.19×10^{-6} 8.60×10^{-2} $1.88 \times 10^{+2}$ 9.08×10^{-9} ND $1.51 \times 10^{+1}$ $6.49 \times 10^{+0}$ $2.58 \times 10^{+2}$ $2.67 \times 10^{+1}$ 2.32×10^{-2} 3.28×10^{-2}	Values from 2006 annual radioactive effluent release report Table 4.5-7 (UniStar 2009) and Table 1C (Constellation 2007).
Population distribution	Table 2.5-10 of the ER (UniStar 2009)		Population distribution used by UniStar and the NRC staff was for year 2080. Note that ESRP Section 5.4.1 requires use of "projected population for 5 years from the time of the licensing action under consideration." Assuming the ESP licensing action occurs in year 2010 and adding 5 years yields year 2015. See discussion of population dose in Section G.2.5.
Wind speed and direction distribution	Table 2.7-42 of the ER (UniStar 2009)		Site-specific data provided by UniStar for 5-year period from 2000 to 2005.
Atmospheric dispersion factors (s/m^3)	Tables 2.7-99 to 2.7-110 of the ER (UniStar 2009)		Site-specific data provided by UniStar for 5-year period from 2000 to 2005.
Ground deposition factors (m^{-2})	Tables 2.7-111 to 2.7-114 of the ER (UniStar 2009)		Site-specific data provided by UniStar for 5-year period from 2000 to 2005.
Milk production rate within a 50-mi radius of the Calvert Cliffs site (kg/yr)	$2.48 \times 10^{+8}$		Site-specific data provided by UniStar (2010).
Vegetable/fruit production rate within a 50-mi radius of the Calvert Cliffs site (kg/yr)	$9.48 \times 10^{+8}$		Site-specific data provided by UniStar (2010).

Table G-4. (contd)

Parameter	Staff Value	Comments
Meat production rate within a 50-mi radius of the Calvert Cliffs site (kg/yr)	$3.02 \times 10^{+8}$	Site-specific data provided by UniStar (2010).
Pathway receptor locations (direction, distance, and atmospheric dispersion factors) - nearest site boundary, vegetable garden, residence, meat animal	Table 5.4-6 and Tables 2.7-105 to 2.7-107 of the ER (UniStar 2010)	Site-specific data provided by UniStar (2010).
Consumption factors for milk, meat, leafy vegetables, and vegetables	Milk (L/yr) 310 (adult) 400 (teen) 330 (child) 330 (infant) Meat (kg/yr) 110 (adult) 65 (teen) 41 (child) 0 (infant) Leafy vegetables (kg/yr) 64 (adult) 42 (teen) 26 (child) 0 (infant) Vegetables (kg/yr) 520 (adult) 630 (teen) 520 (child) 0 (infant)	Table 5.4-5 of the ER (UniStar 2009) and Regulatory Guide 1.109 (NRC 1977).
Fraction of year leafy that vegetables are grown	0.58	Site-specific value from Table 5.4-4 of the ER (UniStar 2009).
Fraction of year that milk cows are on pasture	0.58	Site-specific value from Table 5.4-4 of the ER (UniStar 2009).
Fraction of MEI vegetable intake from own garden	0.76	Default value of GASPAR II code (Strenge et al. 1987).
Fraction of milk-cow intake that is from pasture while on pasture	1	Default value of GASPAR II code (Strenge et al. 1987).

Table G-4. (contd)

Parameter	Staff Value	Comments
Average absolute humidity over the growing season (g/m^3)	8.4	Site-specific value from Table 5.4-4 of the ER (UniStar 2009).
Average temperature over the growing season (°F)	66.8	Site-specific value from Table 5.4-4 of the ER (UniStar 2009).
Fraction of year beef cattle are on pasture	0.58	Site-specific value from Table 5.4-4 of the ER (UniStar 2009).
Fraction of year beef cattle intake that is from pasture while on pasture	1	Default value of GASPAR II code (Strenge et al. 1987).

(a) To convert Ci/yr to Bq/yr, multiply the value by 3.7×10^{10}.

G.2.4 Comparison of Doses to the Public from Gaseous Effluent Releases

Table G-5 compares results documented in the ER (UniStar 2010) for doses from noble gases at the exclusion area boundary with the results calculated by the NRC staff. The doses provided by UniStar and those calculated by the NRC were the same.

Table G-6 presents doses to the MEI calculated by the NRC staff. Doses to the MEI were calculated at the nearest residence, nearest garden, and nearest beef cattle. UniStar revised these calculations in Revision 7 to the ER subsequent to the issuance of the draft EIS. The revisions estimated the doses for ingestion of vegetables and ground deposition at locations closer to proposed Unit 3, and made other changes in meteorological dispersion estimates that increased the dose estimates for the MEI for all gaseous pathways. UniStar's dose estimates for ingestion of vegetables from the nearest garden increased by up to 80 percent, and the dose estimates for direct radiation from ground deposition increased by up to 13 percent. All other increases were seven percent or less. The dose increases were all proportional to the increases in meteorological dispersion and deposition factors. The doses provided by UniStar and those calculated by the NRC were the same to two significant digits.

G.2.5 Comparison of Results – Population Doses

Table G-7 compares the UniStar population dose estimates taken from Table 5.4-13 of the ER (UniStar 2010) with the NRC staff estimates for the new unit. The staff's independent calculation for population dose yields results that are comparable to the UniStar ER estimates for the proposed Unit 3. Both UniStar and the NRC staff used a population estimate for the year 2080 which is a factor of 1.7 times higher than the population estimated for the year 2015 (5 years past the expected licensing action).

Table G-5. Comparison of Doses to the Public from Noble Gas Releases for a New Unit

Type of Dose	UniStar ER (2010) [a]	Staff Calculation
Gamma air dose at exclusion area boundary – noble gases only (mrad/yr)	0.35	0.35
Beta air dose at exclusion area boundary – noble gases only (mrad/yr)	2.9	2.9
Total body dose at exclusion area boundary – noble gases only (mrem/yr)	0.22	0.22
Skin dose at exclusion area boundary – noble gases only (mrem/yr)	2.1	2.1

(a) Results from UniStar ER Table 5.4-12 (UniStar 2010).

Table G-6. NRC Staff Estimates of Doses to the MEI from Gaseous Effluent Releases for a New Unit

Location	Pathway	Total Body Dose (mrem/yr)	Bone Dose (mrem/yr)	Skin Dose (mrem/yr)
Nearest residence, 0.88 mi southeast	Plume	0.22	0.22	2.11
Nearest residence, 0.86 mi South	Ground	0.00167	0.00167	0.00196
Nearest residence, 0.88 mi southeast	Inhalation			
	Adult	0.00444	7.55×10^{-5}	0.00443
	Teen	0.00447	9.21×10^{-5}	0.00447
	Child	0.00396	1.12×10^{-4}	0.00394
	Infant	0.00228	5.91×10^{-5}	0.00227
Nearest garden, 0.98 mi southeast	Vegetable			
	Adult	0.0408	0.185	0.0401
	Teen	0.0648	0.304	0.0639
	Child	0.151	0.732	0.149
Nearest meat animal, 0.88 mi southeast	Meat			
	Adult	0.0179	0.0842	0.0179
	Teen	0.0149	0.0711	0.0148
	Child	0.0275	0.134	0.0275

Table G-7. Comparison of Population Total Body Doses from Gaseous Effluent Releases for Proposed Unit 3

Pathway	UniStar ER (2010) (person-rem/yr)[a]	Staff Estimate Population (person-rem/yr)
Noble gases	2.43	2.47
Iodines and particulates	NR[b]	0.0268
Tritium and C-14	NR[b]	1.19
Total	3.70[c]	3.70

(a) Results from UniStar ER Table 5.4-13 (UniStar 2010).
(b) Values not reported separately in ER (UniStar 2010).
(c) Value includes all radionuclides and pathways.

G.3 Cumulative Dose Estimates

Table G-8 compares UniStar's results for cumulative dose estimates to the MEI with those calculated by the NRC staff. Cumulative dose estimates include doses from all pathways (i.e., direct radiation, liquid effluents, and gaseous effluents) for both the proposed Unit 3 and the existing Units 1 and 2 at the Calvert Cliffs site. These cumulative dose estimates were estimated for comparison to the dose standards of 40 CFR Part 190. Cumulative dose estimates calculated by UniStar (2010) and the NRC staff were the same.

Table G-8. Comparison of Cumulative Doses to the Maximally Exposed Individual

Dose	UniStar ER (2010)[a][b]	Staff Estimate[c]	40 CFR Part 190 Dose Standards
Whole body (mrem/yr)	**0.48**	**0.48**	**25**
Thyroid dose (mrem/yr)	0.93	0.93	75
Dose to other organ – (mrem/yr)[d]	2.0	2.0	25

(a) Doses from direct radiation were determined to be negligible (UniStar 2010).
(b) Sum of dose from liquid and gaseous effluent releases for the two existing units and the proposed unit are from Table 5.4-15 of the ER (UniStar 2010).
(c) The staff calculation included the sum of doses from liquid and gaseous effluent releases from the two existing units and the new proposed unit. Doses from liquid and gaseous effluents for existing units were the maximum annual reported dose from the 2000 to 2009 annual effluent reports for Units 1 and 2
(d) UniStar combined the critical organ for liquids (adult GI-LLI) and gaseous effluents (child – bone) to conservatively represent the maximum dose (UniStar 2010). Staff combined the maximum organ from all pathways as a conservative estimate of maximum organ dose.

G.4 Dose Estimates to the Biota from Liquid and Gaseous Effluents

To estimate doses to the biota from the liquid and gaseous effluent pathways, the staff used the LADTAP II code (Strenge et al. 1986), the GASPAR II code (Strenge et al. 1987), and input parameters supplied by UniStar (2009) in its ER.

G.4.1 Scope

The staff estimated the doses to biota other than humans using surrogate species; using the characteristics of surrogate species to represent a range of species is an accepted methodology. Fish, invertebrates, and algae are used as surrogate aquatic biota species. Muskrats, raccoons, herons, and ducks are used as surrogate terrestrial biota species. The staff recognizes the LADTAP II computer program as an appropriate method for calculating dose to the aquatic biota and for calculating the liquid-pathway contribution to terrestrial biota. The LADTAP II code calculates an internal dose component and an external dose component and sums them for a total body dose. The staff reviewed the input parameters used by UniStar for appropriateness. Default values from Regulatory Guide 1.109 (NRC 1977) were used when site-specific input parameters were not available. The staff concluded that all of the LADTAP II input parameters used by UniStar were appropriate. These parameters were used by the staff in its independent calculations using LADTAP II.

The LADTAP II code calculates biota dose only from the liquid effluent pathway. Terrestrial biota could also be exposed via the gaseous effluent pathway. The gaseous pathway doses would be the same as doses for the MEI calculated using the GASPAR II code. UniStar (2009) used the MEI doses at the exclusion area boundary (0.88 mi from the plant) to estimate these doses. However, because animals may live within the site boundary, closer than maximally exposed humans, the staff used a location 0.25 mi from the release point for estimating onsite biota exposures. The ratio of radionuclide concentrations in air at the biota location to the concentrations at the MEI location is used to adjust (or scale) the dose. Dose from exposure to atmospheric plumes is directly proportional to air concentration. To account for the greater proximity of the main body mass of animals to the ground compared to humans, the biota calculation assumed a ground deposition factor twice that used in the human MEI calculation. The gaseous pathway doses are summed and combined with the liquid pathway doses for a total dose for the representative biota species.

G.4.2 Resources Used

To calculate doses to the biota, the staff used a personal computer version of the LADTAP II and GASPAR II computer codes entitled NRCDOSE Version 2.3.10 (Chesapeake Nuclear Services, Inc. 2008). NRCDOSE was obtained through the Oak Ridge RSICC.

G.4.3 Input Parameters

The NRC staff used the input parameters for LADTAP II and GASPAR II specified in Sections G.2.3 and G.2.4 to calculate biota dose.

G.4.4 Comparison of Results

Table G-9 compares UniStar's biota dose estimates from liquid and gaseous effluents taken from Table 5.4-19 of the ER (UniStar 2010) with the NRC staff's estimates. Dose estimates were similar until staff added ingestion of vegetables and calculated the doses from gaseous releases at a location closer to the gaseous release point. Even though percent differences are large for gaseous doses, all of the estimated doses are well below National Council on Radiation Protection and Measurements and International Atomic Energy Agency guidelines (Section 5.9.5 of this EIS).

Table G-9. Comparison of Dose Estimates to Biota from Liquid and Gaseous Effluents, Unit 3

Biota	Pathway	UniStar ER (2010) (mrad/yr)	Staff Calculation (mrad/yr)	Percent Difference
Fish	Liquid	0.281	0.327	16
	Gaseous[(a)]	NA	NA	-
Muskrat	Liquid	1.16	1.20	3.4
	Gaseous	0.227	7.25	3094
Raccoon	Liquid	0.0469	0.046	-1.9
	Gaseous	0.227	7.25	3094
Heron	Liquid	0.173	0.17	-1.7
	Gaseous	0.227	7.25	3094
Duck	Liquid	1.17	1.02	-12.8
	Gaseous	0.227	7.25	3094
Algae	Liquid	5.62	5.97	6.2
	Gaseous[(a)]	NA	NA	NA
Invertebrate	Liquid	2.33	2.67	14.6
	Gaseous[(a)]	NA	NA	NA

(a) Fish, invertebrate species, and algae would not be exposed to gaseous effluents.

G.5 References

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

40 CFR Part 190. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations."

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Appendix H

Authorizations, Permits, and Certifications

Appendix H

Authorizations, Permits, and Certifications

This appendix contains a list of the environmental-related authorizations, permits, and certifications potentially required by Federal, State, regional, local, and affected Native American tribal agencies related to the combined license for the Calvert Cliffs Nuclear Power Plant, Unit 3. The table is adapted from Table 1.3-1 of the Environmental Report submitted to the U.S. Nuclear Regulatory Commission (NRC) by UniStar.

Table H-1. Authorizations/Permits Required for Combined License

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
NRC	10 Code of Federal Regulations (10 CFR) Part 40	Source Material License	Possession, use and transfer of source material.	Submitted March 2008; to be issued as part of the COL
NRC	10 CFR Part 52, Subpart C	Combined License	Construction and operation of a nuclear power plant.	Submitted Part 1 July 2007, full application submitted March 2008
NRC	10 CFR Part 70	Special Nuclear Material License	Possession, delivery, receipt, use, transfer of fuel.	Submitted March 2008; to be issued as part of the COL
NRC	10 CFR Part 30	By-product Material License	Production, transfer, receipt acquisition, ownership, possession of nuclear byproduct materials	Submitted March 2008; to be issued as part of the COL
NRC	Clean Air Act Section 176 (42 U.S.C. 7506); 40 CFR Part 93 Subpart B	Air Conformity Analysis	Conformity with State Implementation Plan for criteria air pollutants in non-attainment zones	Prior to issuance of the combined license
Federal Aviation Administration	49 U.S.C. 44718; 14 CFR 77.13	Construction Notice	Construction of structures (>200 feet) affecting air navigation	Issued August 2009
U.S. Army Corps of Engineers (USACE)	Federal Water Pollution Control Act, Section 404; 33 CFR 322-323; Rivers and Harbors Act 33 U.S.C. 403 Section 10; 33 U.S.C. 1344	Individual Permit	Excavation, dredging, and/or disposal of dredged material in navigable waters; filling of waters of U.S.	Submitted May 2008

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
Maryland Department of the Environment (MDE)	Coastal Zone Management Act, 16 U.S.C. 1451 *et seq*., 15 CFR 930.57	CZMA Consistency Certification and Approval	Activities affecting the state's coastal zone resources.	Incorporated as part of USACE/MDE Joint Permit Application submitted May 2008
U.S. Fish and Wildlife Service (FWS)	Endangered Species Act (ESA) Section 7, 16 U.S.C. 1536	Consultation regarding potential to adversely impact protected species	Identification of protected species and critical habitat onsite and in the vicinity of site, assessment of construction and operation impacts.	Began Informal consultation January 2009
National Marine Fisheries Service (NMFS)	ESA Section 7, 16 U.S.C. 703 *et seq*.; 50 CFR 402	Consultation regarding potential to adversely impact protected species	Identification of protected species and critical habitat onsite and in the vicinity of site, assessment of construction and operation impacts.	Incorporated as part of USACE/MDE Joint Permit Application submitted May 2008
NMFS	Magnuson-Stevens Fishery Conservation Management Act Section 305(b); 16 U.S.C. 1801 *et seq.*	Consultation regarding potential impacts to essential fish habitat (EFH)	Identification of EFH in the site vicinity, assessment of project operations impacts	Incorporated as part of USACE/MDE Joint Permit Application submitted May 2008
FWS	Bald and Golden Eagle Protection Act, 16 U.S.C. 668(a); Migratory Bird Permits, 50 CFR 21	Eagle Scientific Collecting Permit	Eagle management activities	Issued March 26, 2009

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
State Historic Preservation Office (SHPO) / MD Historical Trust	National Historic Preservation Act (NHPA) 16 U.S.C. 470 *et seq.*; 36 CFR 800	Cultural Resources Review and Consultation	Identification, description and evaluation of cultural resources on and in the site vicinity with the potential to be impacted by construction and operation.	Phase I and II completed 2007 and 2008, respectively. MOA issued March 2010.
Maryland Public Service Commission (MPSC)	Annotated Code of MD 7-207 and 7-208; Code of Maryland Regulations 20.79	Certification of Public Convenience and Necessity (CPCN)	Site preparation for construction and operation of electric generating station	Issued June 26, 2009
MPSC	Annotated Code of MD 7-207 and 7-208; Code of Maryland Regulations 20.79	CPCN	Modification to an existing permit.	Issued August 24, 2010
MPSC	Annotated Code of MD 7-207 and 7-208; Code of Maryland Regulations 20.79	CPCN	Construction or modification of transmission lines (Lines to be modified)	Issued June 26, 2009
MDE	Federal Water Pollution Control Act 33 U.S.C. 1341 *et seq.*, Code of Maryland Regulations 26.08.02.10	Section 401 Water Quality Certification	Compliance with state water quality standards	Issued on April 25, 2011.
U.S. Environmental Protection Agency (EPA)	Federal Water Pollution Control Act Section 316(a), Code of Maryland Regulations 26.08.03.03	Water quality impact assessment	Demonstrate thermal discharges to water comply with thermal discharge criteria, and are protective of aquatic species	With NPDES permit application to be submitted December 2013
EPA/MDE	Federal Water Pollution Control Act Section	Best Technology Available	Demonstrate cooling water intake structure represents Best	With NPDES permit application to be

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
	316(b), Code of Maryland Regulations 26.08.03.05	demonstration	Technology Available in minimizing potential for entrainment/impingement of aquatic species.	submitted December 2013
MDE	Federal Water Pollution Control Act Section 402; 33 U.S.C. 1342; Code of Maryland Regulations 26.08.04	National Pollution Discharge Elimination System (NPDES) permit	Discharge of industrial wastewater and stormwater during operation	Application to be submitted in December 2013
Maryland Department of Natural Resources	Code of Maryland Regulations 08.03.08.03	Maryland listed threatened species	Removal of bald eagle nest within Limit of Disturbance	Issued January 2010
MDE	Code of Maryland Regulations 26.08.04.09	General NPDES permit for stormwater associated with construction activity	Discharge of stormwater during construction	Issued February 2008
MPSC/ MDE	Code of Maryland Regulations 26.24 and 20.79.03.02.B(4)(g)	Maryland Tidal Wetlands License	Construction work in tidal wetlands	Submitted May 2008 under Joint Permit Application and included in CPCN application
MPSC/ MDE	Code of Maryland Regulations 26.23 and 20.79.03.02.B(4)(g)	Maryland Non-Tidal Wetlands Permit	Construction work in non-tidal wetlands	Submitted May 2008 under Joint Permit Application

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
MDE	Code of Maryland Regulations 26.17.04	Waterway and 100-year floodplain permits	Any activity that changes the course, current, or cross-section of a non-tidal stream or body of water, including the 100-year floodplain	Submitted May 2008 under Joint Permit Application
MDE	Code of Maryland Regulations 26.17.01	Erosion and Sediment Control Plan	Land clearing, grading, or other earth disturbance (construction)	November 2009
MDE	Code of Maryland Regulations 26.17.02	Stormwater Management Plan	Land development activity (construction and operation)	November 2009
Chesapeake Bay Critical Area (CBCA) Commission	Code of Maryland Regulations 27.02	CBCA conformance	Construction and operation of an electric generating facility in the CBCA	Issued August 2008, Revised plan approval issued August 2009
MPSC	Code of Maryland Regulations 26.17.06; 20.79.03.02.B(3)(e)	Water appropriation permit	Withdrawal of groundwater for construction and withdrawal of surface water during operation	Issued June 26, 2009
MDE	Code of Maryland Regulations 26.03.12	Major Water Facilities Permit	Construction of potable water supply system	Application to be submitted 2nd quarter 2015
MDE	Code of Maryland Regulations 26.03.12	Major Sewerage System Permit	Construction of sanitary waste treatment system for operation	Application to be submitted 2nd quarter 2015

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
MDE	Code of Maryland Regulations 26.04.06	Sewage Sludge Utilization Permit	Disposal of sludge from sewage treatment plant	Application to be submitted 2nd quarter 2015
EPA / MDE	40 CFR 262.12, Code of Maryland Regulations 26.13.03	Hazardous Waste Generator Registration	Generation and storage of hazardous waste for ≤90 days	Application submitted January 2010
MDE	Code of Maryland Regulations 26.12.01.01	State Radioactive Materials License	Possession, use, acquisition, ownership, transfer of radioactive materials not regulated by NRC	January 2015
MDE	Code of Maryland Regulations 26.10.01.07	Oil Operations Permit	Storage of oil in above ground storage tanks ≥10,000 gal and/or >1,000 gal of used oil	January 2015
MPSC	Code of Maryland Regulations 26.11.02	State Air Permit to Construct – Construction Phase	Construction of construction-phase air pollutant emission sources	Encompassed within CPCN issued June 26, 2009
MPSC	40 CFR 52.21; Code of Maryland Regulations 26.11.01 and 26.11.02	Prevention of Significant Deterioration (PSD) – Construction Phase	Construction and operation of construction-phase major stationary sources of attainment pollutants	Encompassed within CPCN issued June 26, 2009
MPSC	Code of Maryland Regulations 26.11.01, 26.11.02, 26.11.17	New Source Review (NSR) – Construction Phase	Construction of construction-phase major stationary sources of nonattainment pollutants	Encompassed within CPCN issued June 26, 2009

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
MPSC	Code of Maryland Regulations 26.11.02; 20.79.03.02.B(2)(c)	State Air Permit to Construct – Operational Phase	Construction of operational-phase air pollutant emission sources	Encompassed within CPCN issued June 26, 2009
MPSC	40 CFR 52.21; Code of Maryland Regulations 26.11.01, 26.11.02 and 20.79.03.02.B(2)(c)	PSD-Operational Phase	Construction of major stationary sources of attainment pollutants for operational phase facilities	Encompassed within CPCN issued June 26, 2009
MPSC	Code of Maryland Regulations 26.11.01, 26.11.02, 26.11.17, and 20.79.03.02.B(2)(c)	NSR – Operational Phase	Construction of major stationary sources of nonattainment pollutants for operational phase facilities	Encompassed within CPCN issued June 26, 2009
MDE	Code of Maryland Regulations 26.11.03; 20.79.03.02.B(2)(c)	Clean Air Act Title V Operating Permit State Operating Permit	Operation of existing facility with major stationary sources of air emissions	Application submitted May 2010
Maryland State Highway Administration	Annotated Code of MD 8-625 and Code of Maryland Regulations 11.04.05	Highway Access Permit	Construction of new or modified entrances on state highways	Estimated completion in 2012
Calvert County Department of Planning and Zoning	Calvert County Code, Ordinances and Resolutions Chapter 18, Building Code of Calvert County	County Grading Permit	Clearing and grading of land	Approved February 19, 2010

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
Calvert County Department of Planning and Zoning	Calvert County Code, Ordinances and Resolutions Chapter 18, Building Code of Calvert County	County Building Permit, and Related Site Development Plan	Construction of buildings and other structures.	Application to be submitted in 3rd quarter 2011
Calvert County Department of Planning and Zoning; Inspections and Permits	Calvert County Zoning, Ordinance, Article 4	County Use and Occupancy Permit	Use and occupancy of buildings	Certificate of Occupancy issued as defined by Building Permit
Federal Energy Regulatory Commission	Section 205 of the Federal Power Act	Market Based Rate Authorization and related energy regulatory matters (e.g., Exempt Wholesale Generator filing)	Authority to sell power at market-based rates	Based on agency guidance
Calvert County Department of Planning and Zoning	Calvert County Code, Ordinances and Resolutions Chapter 18, Building Code of Calvert County	County Permit for Structure Demolition or Move	Demolish certain structures and move certain structures at Camp Canoy	Approved January 2010
EPA	40 CFR 82.162	Ozone-Depleting Substance (ODS) Compliance Certification	Recovery and recycling of ODS	To be determined

Table H-1. (contd)

Agency	Authority	Requirement	Activity Covered	Permit Issued or Authorization Obtained/Status
U.S. Department of Energy	Nuclear Waste Policy Act of 1982	Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste	Disposal of spent nuclear fuel and/or high-level radioactive waste	November 2008
U.S. Department of Transportation	49 CFR 107, Subpart G	Certificate of Registration	Transportation of hazardous materials	Application to be submitted in April 2011
Tennessee Department of Environment and Conservation-Division of Radiological Health	Tennessee Department of Environment and Conservation Rule 1200-2-10.32	Tennessee Radioactive License for Delivery	Transportation of radioactive waste into the State of Tennessee (below regulatory limits materials)	Application to be submitted in November 2015
State of Utah Department of Environmental Quality – Division of Radiological Control	Utah Radiation Control Rules R313-26	General Site Access Permit	Transportation of radioactive waste into the State of Utah	Application to be submitted in November 2015

Appendix I

Severe Accident Mitigation Alternatives

Appendix I

Severe Accident Mitigation Alternatives

I.1 Introduction

UniStar has submitted an application to construct an AREVA NP Inc. (AREVA) U.S. EPR at the Calvert Cliffs site. Current policy developed after the Limerick decision (Limerick 1989) requires that the U.S. Nuclear Regulatory Commission (NRC) staff consider alternatives to mitigate the consequences of severe accidents in a site-specific environmental impact statement (EIS). The severe accident mitigation alternative (SAMA) review presented here considers both severe accident mitigation design alternatives (SAMDAs) and procedural alternatives.

In Title 10 of the Code of Federal Regulations (CFR), 10 CFR 52.79(a)(38), the NRC requires that an applicant for a combined license (COL) include "… a description and analysis of design features for the prevention and mitigation of severe accidents…" in the Final Safety Analysis Report (FSAR). The UniStar COL application provides this information in the FSAR (UniStar 2010a). The Environmental Report (ER) (UniStar 2010b) also includes information regarding the SAMA analysis.

In 10 CFR 52.47(a)(23), the NRC requires that applicants for design certification include "… a description and analysis of design features for the prevention and mitigation of severe accidents…" in the application for design certification. In 10 CFR 52.47(a)(27) the NRC requires a description of a "…plant-specific probabilistic risk assessment (PRA) and its results," and in 10 CFR 52.47(b)(2) the NRC requires an ER that contains the information required by 10 CFR 51.55. AREVA has submitted all of this information in documents that are part of the application for certification of the U.S. EPR design.

While the NRC staff has not completed its generic SAMDA review of the U.S. EPR for design certification, the staff has conducted a review of the UniStar SAMDA analysis specific to operation of a U.S. EPR at the Calvert Cliffs site. The staff reviewed the input parameters and values used by UniStar (2009) for appropriateness, including references made to the U.S. EPR design certification ER (AREVA 2009). The UniStar analysis is based on:

1. the PRA included as Section 19.1 of the U.S. EPR FSAR (AREVA 2010) and the SAMDA analysis in the U.S. EPR ER (AREVA 2009), and
2. results of the analysis of probability-weighted risks of the U.S. EPR design at the Calvert Cliffs site described in Section 5.11.2 of this EIS.

An analysis for a U.S. EPR at a generic site is presented first; then the analysis is extended to include consideration of Calvert Cliffs site-specific information. These analyses have been updated by the NRC staff based on Revision 2 to the U.S. EPR FSAR (AREVA 2010). The SAMDA analysis for the proposed U.S. EPR design certification will be finally resolved through the design certification rulemaking process.

I.2 U.S. EPR SAMDA Review – Generic Site

This section addresses the generic analysis of SAMDAs conducted by AREVA, the applicant for the design certification of the U.S. EPR design. The SAMA review in Section I.3 extends the generic SAMDA analysis to include Calvert Cliffs site-specific factors including meteorology, population, and land use. Section I.3 also addresses SAMAs that were not included in the generic analysis because they do not involve reactor system design.

I.2.1 U.S. EPR PRA Results

AREVA, the applicant for certification of the U.S. EPR design, conducted Level 1 and Level 2 PRAs to estimate the core damage frequencies (CDF) that might result from a large number of initiating events and accident sequences. Table I-1 lists these CDF estimates and estimates of the large release frequencies (LRF) of iodine, cesium, or tellurium. Releases associated with containment bypass, containment isolation failure, or containment failure at or before reactor vessel failure are considered to be large. Table I-1 also lists NRC staff goals related to CDFs and LRFs.

Table I-1. Comparison of U.S. EPR PRA Results with the Design Goals

	NRC Design Goal[a]		U.S. EPR PRA Results[b]	
	Core Damage Frequency (yr^{-1})	**Large Release Frequency (yr^{-1})**	**Core Damage Frequency (yr^{-1})**	**Large Release Frequency (yr^{-1})**
Internal At Power Events	1.0×10^{-4}	1.0×10^{-6}	2.8×10^{-7}	2.2×10^{-8}
Internal Flooding Events	1.0×10^{-4}	1.0×10^{-6}	6.1×10^{-8}	1.1×10^{-9}
Internal Fire Events	1.0×10^{-4}	1.0×10^{-6}	1.8×10^{-7}	3.6×10^{-9}
Low Power and Shutdown Events	1.0×10^{-4}	1.0×10^{-6}	5.8×10^{-8}	5.7×10^{-9}

(a) SECY-90-016 (NRC 1990)
(b) From Chapter 19 of the U.S. EPR FSAR (AREVA 2010)

Although the U.S. EPR PRAs did not provide quantitative estimates of CDFs and LRFs for seismic and other external initiating events such as hurricanes and tornadoes, they are discussed in the FSAR. The Section 19.1.5.1 of the FSAR (AREVA 2010) presents the results of a seismic margins analysis in which PRA methods are used to identify potential vulnerabilities in the design and so corrective measures can be taken to reduce risk. Similarly, FSAR Section 19.1.5.4 addresses risks associated with high winds, tornado missiles, external flooding, and external fires. Risks associated with these events are considered to be insignificant by AREVA.

I.2.2 Potential Design Improvements

In the ER submitted as part of the design certification application (AREVA 2009), AREVA identified 167 candidate alternatives based on a review of industry documents, including previous SAMDA reviews and NRC evaluations of those reviews, and consideration of plant-specific enhancements. The candidate alternatives were then screened to identify candidates for detailed evaluation. The categories used in screening were

- not applicable
- already implemented
- combined
- excessive implementation cost
- very low benefit
- not required for design certification
- consider for further evaluation.

The development of the U.S. EPR design has benefitted from insights gained in numerous PRAs. The low CDFs and LRFs in Table I-1 are attributable to the implementation of design improvements already incorporated into the U.S. EPR design. The following are examples of the 67 candidate alternatives already included in the design:

- increase direct current battery capacity
- improve direct current bus load shedding
- provide an additional diesel generator
- install self-actuating containment isolation valves
- replace steam generators with new designs
- install relief valves in the component cooling water system
- create a reactor coolant depressurization system

- add a motor-driven feedwater pump
- improve seismic ruggedness of plant components.

The screening process eliminated 21 candidate alternatives as being inapplicable for the U.S. EPR design; 4 candidate alternatives were combined with similar alternatives; and 51 candidate alternatives were procedural or administrative rather than design alternatives. Of the remaining 24 candidate alternatives, 1 was categorized as very low benefit because it would not significantly reduce risk, and 23 were categorized as having excessive implementation costs. No candidate alternatives were identified for further evaluation.

I.2.3 Cost-Benefit Comparison

AREVA used the cost-benefit methodology found in NUREG/BR-0184, *Regulatory Analysis Technical Evaluation Handbook* (NRC 1997), to calculate the maximum attainable benefit associated with completely eliminating all risk for the U.S. EPR.

This methodology involves determining the net value for a SAMDA according to the following formula:

Net Value = (APE + AOC + AOE + AOSC) - COE

where

APE	=	present value of averted public exposure ($)
AOC	=	present value of averted offsite property damage costs ($)
AOE	=	present value of averted occupational exposure costs ($)
AOSC	=	present value of averted onsite costs ($); this includes cleanup, decontamination, and long-term replacement power costs
COE	=	cost of enhancement ($)

If the net value of a SAMDA is negative, the cost of implementing the SAMDA is larger than the benefit associated with the SAMDA and it is not considered to be cost beneficial.

To assess the risk reduction potential for SAMDAs, AREVA (AREVA 2009) assumed that each design alternative would work perfectly to completely eliminate all severe accident risk from the internal events. This assumption is conservative as it maximizes the benefit of each design alternative. AREVA estimated the public exposure benefits for the design alternative on the basis of the reduction of risk expressed in terms of whole body person-rem per year received by the total population within a 50-mi radius of the generic site hosting a U.S. EPR.

Table I-2 summarizes AREVA's estimates of each of the associated cost elements. The provided results are based on the approach, parameters, and data listed in NUREG/BR-0184. Baseline risks used in the analysis were 1.98 $\times 10^{-1}$ person-rem/yr population dose risk and $182 per year for cost risk for internal events during full-power operation (AREVA 2009).

Table I-2. Summary of Estimated Maximum Averted Costs for a Generic Site

Quantitative Attributes		Averted Cost Estimate ($)[a] 7% discount	3% discount
Health	Public (APE)	5094	10,072
	Occupational (AOE)	264	607
Property	Offsite[b] (AOC)	2603	5147
	Onsite	NA[c]	NA[c]
Cleanup and Decontamination	Onsite (AOSC)[d]	8215	19,110
Replacement Power	(AOSC)[d]	36,888	148,960
Total[e]		53,063	164,179
Total with seismic risk		70,574	218,358

(a) From the design certification ER (AREVA 2009).
(b) Includes offsite cleanup and decontamination costs.
(c) Not Analyzed.
(d) AOSC includes onsite cleanup and decontamination costs and the cost of replacement power.
(e) Based on internal event, internal flooding, and internal fire risks.

The monetary present value estimate for each risk attribute does not represent the expected reduction in risk resulting from a single accident; rather, it is the present value of a stream of potential losses extending over the projected lifetime of the facility (in this case projected to be 60 years). Therefore, the averted cost estimates reflect the expected annual loss resulting from a single accident, the possibility that such an accident could occur at any time over the licensed life, and the effect of discounting these potential future losses to present value.

As indicated above, AREVA estimated the total present dollar value equivalent associated with complete elimination of severe accidents at a single U.S. EPR unit site to range between about $53,100 and about $164,200. The estimated cost of replacement power has the largest effect on the averted cost. To account for the seismic risks, AREVA increased these estimates by a factor 1.33. The resulting best estimate of maximum averted costs is about $70,600 with an upper bound estimate of about $218,400. For any SAMDA to be potentially cost beneficial, the enhancement cost must be less than $218,400. Based on a cost estimate of $70,600, AREVA concluded that none of the SAMDA candidates are cost beneficial. Based on screening estimates, AREVA (2009) estimated that the minimum implementation cost for a SAMDA would be about $150,000. AREVA also noted that the costs estimates for public health impacts (APE) and offsite costs (AOC) could double without affecting the SAMDA analysis.

I.2.4 Staff Evaluation

In 10 CFR 52.47(a)(27), the NRC requires that an applicant for design certification perform a plant- or site-specific PRA. The aim of this PRA is to seek improvements in the reliability of core and containment heat removal systems that are significant and practical. The set of potential design improvements considered for the U.S. EPR include those from industry guidance, previous SAMDA review, and review of the U.S. EPR design. The U.S. EPR design already incorporates many design enhancements related to severe accident mitigation. Such design improvements have resulted in a CDF that are two orders of magnitude lower than the CDFs for the existing Calvert Cliffs Units 1 and 2.

AREVA's averted cost estimates are based on point-estimate values, without consideration of uncertainties in CDF or offsite consequences. Even though this approach is consistent with that used in previous design alternative evaluations, further consideration of these factors could lead to significantly higher risk reduction values, given the extremely small CDF and risk estimates in the baseline PRA. Uncertainties either in CDF or in offsite radiation exposures resulting from a core damage event are fairly large because key safety features of the U.S. EPR design are unique, and their reliability has been evaluated through analysis and testing programs rather than through operating experience.

Further, in evaluating the costs of SAMDA candidates, AREVA did not explicitly assess the capital costs associated with the various alternatives. Instead, AREVA used estimated costs of back fitting of similar SAMDAs provided by industry in license renewal applications. This approach has the potential to overestimate the actual costs of SAMDAs because the cost of implementing a modification to a reactor that has been built is always greater than implementing the modification in a design that is still evolving.

I.3 Calvert Cliffs Site-Specific SAMA Review

The discussion above evaluates SAMDAs for the U.S. EPR at a generic site. The discussion that follows updates that evaluation to include consideration of Calvert Cliffs site-specific factors including meteorological conditions, population distribution, and land use. It is based on the UniStar SAMDA analysis presented in the ER (UniStar 2010b) and the U.S. EPR ER (AREVA 2009) revised to account for changes in the U.S. EPR FSAR (AREVA 2010). The last part of this discussion deals with procedural and training SAMAs.

I.3.1 Risk Estimates

UniStar estimated severe accident risks for a U.S. EPR at the Calvert Cliffs site in Section 7.2 of its ER (UniStar 2010b). The NRC staff evaluated the information for the U.S. EPR design supplied by AREVA and UniStar (AREVA 2010; UniStar 2010a and 2010b) and Calvert Cliffs site-specific data (meteorology, demographics, and land use) provided by UniStar (UniStar 2010a, 2010b). The results of these analyses are found in Table 5-16 in Chapter 5 of this EIS (Vol. 1).

Table 5-16, gives a CDF of 5.3×10^{-7} yr^{-1}, and population dose and cost risks of 3.47×10^{-1} person-rem yr^{-1} and \$363 yr^{-1}, respectively. These risks are based on internally initiated events, internal flooding events, and internal fire events that occur while the reactor is at power. The U.S. EPR FSAR (AREVA 2010) gives a total CDF for events occurring while the reactor is at low power or shutdown that is about an order of magnitude less than the total at power CDF.

I.3.2 Cost-Benefit Comparison

In Section 7.3.2 of the ER (UniStar 2010b), UniStar estimates the averted costs associated with eliminating all severe accident risks associated for a U.S. EPR at the Calvert Cliffs site. The UniStar analysis is an update of the AREVA SAMDA analysis (AREVA 2009) to include site-specific information. UniStar substituted population dose and offsite cost risks based on 2050 population projections for the Calvert Cliffs site for the population dose and offsite property costs in the AREVA analysis. Table I-3 shows both the AREVA generic averted cost estimates and the UniStar estimates.

Table I-3. Summary of Estimated Averted Costs for the Calvert Cliffs Site

		Averted Cost Value Estimate (\$)			
		AREVA Generic[(a)]		Calvert Cliffs Site[(b)]	
Quantitative Attributes		7% discount	3% discount	7% discount	3% discount
Health	Public (APE)	5094	10,072	9766	22,812
	Occupational (AOE)	264	607	264	607
Property	Offsite[(c)] (AOC)	2603	5147	5108	10,100
	Onsite	NA[(d)]	NA[(d)]	NA[(d)]	NA[(d)]
Cleanup and Decontamination	Onsite (AOSC)[(e)]	8215	19,110	8202	19,110
Replacement Power	(AOSC)[(e)]	36,888	129,243	36,859	129,243
	Total	**53,063**	**164,179**	**60.018**	**178,369**
Total with seismic risk		**70,574**	**218,358**	**79,824**	**237,231**

(a) From design certification ER (AREVA 2009).
(b) UniStar estimates (UniStar 2010b) .
(c) Includes cleanup and decontamination costs.
(d) Not Analyzed.
(e) AOSC includes onsite cleanup and decontamination cost and the cost of replacement power.

In assessing the risk reduction potential of design improvements for the U.S. EPR, the NRC staff evaluated the AREVA risk reduction estimates for the various design alternatives and assessed the potential impact of uncertainties on the results. The analyses in Table I-2 and Table I-3 present the value of reducing the severe accident risk to zero. These values are used in screening potential SAMDAs. Using the results in Table I-2, AREVA concluded that no candidate alternative from an initial list of 167 alternatives would be cost beneficial. The Calvert Cliffs site-specific values, although higher than those estimated for a generic site, are below the minimum estimated cost for a design change. Moreover, no SAMDA can reduce the risk to zero. Therefore, the staff concludes that it is highly unlikely that any SAMDA would be cost beneficial at the Calvert Cliffs site.

I.3.3 Procedural and Training SAMAs

The original list of 167 U.S. EPR SAMDAs included 51 candidate alternatives that were procedural or training in nature. These items were eliminated from consideration because they did not involve design changes. Examples of items screened out for this reason include

- develop procedures for replenishing diesel fuel oil
- emphasize steps in recovery of offsite power after a station blackout in training
- institute simulator training for severe accident sequences
- delay containment spray actuation after a large loss of coolant accident
- implement procedures to stagger high-pressure safety injection pump use after a loss of service water
- provide operator training on manually actuating the extra borating system.

These candidate alternatives fall within the scope of the SAMA review that the NRC staff conducts as part of its environmental review of applications. However, such SAMAs generally involve operational and training procedures that have not been developed and that are typically not developed until construction has been completed and the plant is approaching operation.

The staff reviewed the candidate alternatives that were previously screened out because they did not involve design changes. Because the maximum attainable benefit is so low, a SAMA based on procedures or training for a U.S. EPR at the Calvert Cliffs site would have to reduce the CDF or risk to near zero to become cost beneficial. Based on its evaluation, the staff concludes that it is unlikely that any of the SAMAs based on procedures or training would reduce the CDF or risk that much. Therefore, the staff further concludes it is unlikely that these SAMAs would be cost effective.

UniStar (2009) has stated that "… the plant administrative processes, procedures, and training program will be developed to address appropriate maintenance and use of the U.S. EPR design features which have been credited with the reduction of risk associated with postulated severe accidents." Based on this statement, the staff expects that UniStar will consider risk insights and mitigation measures in the development of procedures and training; however, this expectation is not crucial to the staff's conclusions because the staff already concluded procedural and training SAMAs would be unlikely to be cost effective.

I.3.4 Conclusions

Based on its evaluation of the U.S. EPR PRA (AREVA 2010) and SAMDA analysis (AREVA 2009), the Calvert Cliffs site-specific severe accident and SAMDA analyses (UniStar 2010b) and its own independent review, the staff concludes that that there are no U.S. EPR SAMDAs that would be cost beneficial at the Calvert Cliffs site. The staff expects that UniStar will consider risk insights and mitigation measures in the development of procedures and training; however, this expectation is not crucial to the staff's conclusions because the staff concludes procedural and training SAMAs would be unlikely to be cost effective.

I.4 References

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

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

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Appendix J

UniStar's Least Environmentally Damaging Practicable Alternative (LEDPA) and Onsite Alternatives Analysis

Appendix J

UniStar Least Environmentally Damaging Practicable Alternative (LEDPA) and Onsite Alternatives Analysis

UniStar provided an alternative site analysis (UniStar 2009) that describes the offsite alternatives relative to wetland and stream impacts and a statement on the least environmentally damaging practicable alternatives (LEDPA). UniStar also provided an onsite alternative analysis that describes the onsite alternative layouts relative to wetland and stream impacts. These alternative site analyses are shown in the balance of this appendix.

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Appendix F—US Army Corps of Engineers (USACE) Information

This appendix contains: 1) Project Purpose, 2) the Least Environmentally Damaging Practicable Alternative (LEDPA) Analysis.

Section F1 - Purpose

The basic purpose for the project is to generate electricity for additional baseload capacity.

The overall purpose of the project is to construct a nuclear power plant facility to provide for additional baseload electrical generating capacity to meet the growing demand in the State of Maryland.

Section F2 – LEDPA Analysis

Table 9.3-12 of ER Chapter 9 of the Calvert Cliffs Unit 3 COLA presents the impacts of the EPR project at four sites; the proposed site and three alternative sites. The relevant information from the subject table needed for a 404(b)1 analysis and subsequent LEDPA determination by the USACE has been provided in the COLA ER Tables 9.3-12, 9.3-13, and 9.3-14 below.

Review of the tables identifies that relative to impacts to Waters of the U.S. *on the site itself,* EASTALCO would be the LEDPA site. However, further evaluation of associated off-site impacts required for water line and transmission line right-of-way (ROW) construction associated with the Alternative Sites, supports Calvert Cliffs Unit 3 as the LEDPA site.

A LEDPA analysis, by regulation, should help identify a site with the least impact to Waters of the U.S. *and with no significant adverse impacts to other environmental resources* as the Least Environmentally Damaging Practicable Alternative Accordingly, based upon a comprehensive evaluation, including 41 other environmental impact criteria used to evaluate the four sites, Calvert Cliffs Unit 3 Alternative Site Evaluation Report (ASER) and supporting materials clearly demonstrate that the Calvert Cliffs Unit 3 site has the smallest overall impact to environmental resources and therefore is the environmentally preferred location for construction of the EPR within the defined Region of Interest, Maryland.

The dredging for barge access is unique to Calvert Cliffs due to its location and existing nuclear facilities. The proposed tidal wetland impact is approximately 5.7 acres (4.5 acres due to the barge slip restoration and the balance of 1.2 acres is associated with the intake structure, discharge pipe, and fish return). The barge facility restoration work to access the pier and improve navigation would have eventually been necessary to service the existing facilities at Units 1 and 2. The tidal work does not impact the overall LEDPA conclusion, as Calvert Cliffs was selected based on a comprehensive evaluation as described below.

The Alternative Sites Bainbridge and EASTALCO share a similar navigable riverine environment where in-water Cooling Water Intake Structure (CWIS) components are proposed. Similar methods of in-water work and identical impacts below Ordinary High Water (OHW) or Mean High Water shoreline (MHW) were assumed. Certain assumptions were used in the calculations of impacts associated with in-water work, estimated at 0.23 acre (100'x100'). These assumptions are based on understanding of the physical environment, based on screening level data and experience of the UniStar Nuclear Energy team with similar projects. Primary factors included the following: an assumption that 0.23 acre would accommodate the cooling water intake system components and any necessary turbidity curtain array or coffer dam; work within the 0.23 acre disturbance footprint could accommodate dredging, blasting, drilling, or any other typical construction methods; the use of horizontal directional drilling (HDD) could be employed to avoid open cut or surface lay pipeline impacts; the pump house and support structures can be sited outside of any regulatory resource area.

The Thiokol Alternative Site is located along the Patuxent River. Because of the soft muddy substrate documented to be in the river at the location of the cooling water intake and discharge locations and a shallow shelf along the southern shoreline that must be spanned to reach suitable water depths, the following assumptions were included in the calculation of impacts presented here: 1) HDD will not be an effective technology, 2) dredging must be employed for the pipe trench and CWIS component locations, 3) the CWIS would need to be located 1000' or greater offshore. Under this scenario, work would be proposed to impact approximately 2.25 acres of waters below MHW, and require approximately 8,000 cubic yards of (in-place) sediment.

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Table 9.3-12 Comparison of Wetland and Waterway Impacts from Alternative Sites Evaluation (Reconnaissance Level Data)

	Proposed Site		Alternative Sites					
	Calvert Cliffs 3[16]		Bainbridge		EASTALCO		Thiokol[17]	
Property Acreage	2057.2		1068.6		1742.1		620.0	
Wetlands – Total Property[1] (ac)	173.2		4.6		22.0		49.8	
Wetlands – Site[2] (ac)	6.6		0.0		0.0		34.5	
Streams – Total Property[3] (LF)	21805		8654		32944		7055	
Streams – Site[4] (LF)	3604		1557		1311		3435	
Wetlands Affected – Site[5] (ac)	6.6		0.0		0.0		34.5	
Streams Affected – Site[6] (LF)	3604		1557		1311		3435	
Section 10 Waters: Tidal (ac)	5.7[7]		NA		NA		2.25[8]	
Navigable Riverine (ac)	N/A		0.23[9]		0.23[9]		NA	
Off-Site Wetlands/Waterways Affected –ROWs and Interconnects (ac/LF)[7]	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams
CWIS (in-water components)(ac)[11]	0.23	0	0.23	0	0.23	0	0.23	0
CW Pump House (ac.)[12]	NA	NA	0	0	0	0	0	0
Water Line ROW (ac)[13]	NA	NA	1.3	0	3.2	865	0.4	0
Transmission Line ROW (ac)[14]	0	0	5.2	3517	0.2	1820	26.6	4051
RR Spur/Improvements (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Access Roadways (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Other Off-Site Uses (ac)[15]	NA	NA	NA	NA	NA	NA	NA	NA

[1] "*Total Property*" includes the entirety of the alternate site facility contiguous land holdings (black outline).

[2] "*Site*" includes the 420 parcel on the Total Property selected for EPR development (red outline).

[3] Describes the total length of all streams on the Total Property in linear feet. Includes both mapped perennial and intermittent waterways and obvious drainage ways observed during site inspections or interpreted from desktop mapping.

[4] Describes streams within the 420 EPR Site, calculated in the same manner as streams for "Total Property".

[5] An assumption has been made that any wetlands within the 420 acre Site would be affected.

[6] An assumption has been made that any streams within the 420 acre Site would be affected by construction.

[7] The actual, not estimated, proposed impacts to Sec. 10 regulated tidal waterways below ordinary high water (OHW) or mean high water shoreline (MHW) is approximately 5.7 acres.

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[8] The Thiokol site cooling water intake and discharge structures are located within the Patuxent River. Directional drilling would not be possible based on soft mud substrate, and suitable water depths are located 1000' feet into the river channel seaward of OHW or MHW. Accordingly, dredging of a 1000' x 45' pipe trench (4' deep) in addition to 0.5 acres for aquatic structures is proposed, totaling approximately 2.25 acres. Dredging volume (in place) is estimated to be approximately 8,000 cubic yards.

[9] For both the Bainbridge and EASTALCO Alternative Sites, 0.23 acre (100'x100') of wetland disturbance below OHW is assumed. This estimation of impact is based upon prior experience in similar environments, and assumes use of directional drilling to approach intake sites, and the ability to contain the intake and discharge structures within a coffer dam or turbidity curtain array with area 0.23 acres.

[10]An assumption has been made that any wetlands or streams within the ROWs or interconnects would be affected by construction. Impacts associated with ROW construction and some in-water construction activities are temporary in nature.

[11]An assumption has been made to allow a 100'x100' area of impact for in-water cooling water intake system (CWIS) components. No alternate sites are proposed to use shoreline intake structures; all intake/discharge structures are proposed to be sited at a depth of -20' MLW or greater. Horizontal directional drilling (HDD) is proposed to access off shore locations.

[12]A cooling water pump house would be located alongshore to the selected cooling water source, and would occupy 0.5 acre total area.

[13]For the purposes of this evaluation, it has been assumed that any water line ROW would require a 120' width for construction to allow installation of 2-60" pipes.

[14]For new transmission line construction or reconductoring of existing circuits to accommodate the EPR, a 300' wide cleared ROW is assumed to be required. The Transmission Corridor for the Thiokol site is different from the one in the March 2009 Requests for Additional Information Responses (UN#09-140)

[15]Other off-site uses include any required parking, laydown, staging requiring land alteration.

[16]ER Section 4.1.1.1 (Rev. 5) states the CCNPP3 and supporting facilities will be located on 2,070 acres; ER Section 4.3.1.3 (Rev. 5) states the construction of CCNPP3 will permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas. This table provides data primarily for the approximate 420-acre EPR Site (see Footnote 2) for consistent comparison with the alternative sites and, therefore, some data in this table will be different from quantities of affected acreage stated in the ER Rev. 5.

[17] ER Section 9.3.2.4.5 (UN#09-319) states that the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream within the 619 ac Thiokol site. This table provides data primarily for an approximate 420-acre EPR site within the overall property boundary. Therefore the data on affected wetlands and streams in this table will differ from the data presented in ER Section 9.3.2.4.5 (UN#09-319).

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.
MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

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Table 9.3-13 Summary of Wetlands on Alternate Sites

	Number of discrete wetlands or systems	Wetland types (NWI classification)	Description
Calvert Cliffs 3	5	1. Freshwater Forested/Shrub Wetland 2. Freshwater Pond 3. Freshwater Pond 4. Freshwater Forested/Shrub Wetland 5. Freshwater Pond	1. 4.7 ac of PFO[1] 2. 0.5 ac of PUB[2] 3. 0.02 ac of PUB 4. 0.5 ac of PFO 5. 0.9 ac of PUB
Bainbridge	5	1. Freshwater Forested/Shrub Wetland 2. Freshwater Pond 3. Riverine 4. Riverine 5. Freshwater Forested/Shrub	1. 3.7 ac 2. 0.9 ac 3. 1.3 ac 4. 3.2 ac 5. 0.7 ac
EASTALCO	10	1. Freshwater Emergent Wetland 2. Freshwater Emergent Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Emergent Wetland 7. Riverine 8. Freshwater Emergent Wetland 9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland	1. 0.2 ac 2. 0.4 ac 3. 0.1 ac 4. 0.3 ac 5. 0.9 ac 6. 0.03 ac 7. 1.3 ac 8. 0.2 ac 9. 0.3 ac 10. 0.7 ac

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Table 9.3-13 Summary of Wetlands on Alternate Sites

	Number of discrete wetlands or systems	Wetland types (NWI classification)	Description
Thiokol	14	1. Freshwater Forested/Shrub Wetland 2. Freshwater Forested/Shrub Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Forested/Shrub Wetland 7. Freshwater Forested/Shrub Wetland 8. Freshwater Pond 9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland 11. Freshwater Emergent Wetland 12. Estuarine and Marine Wetland 13. Estuarine and Marine Deepwater 14. Freshwater Emergent Wetland	1. 2.5 ac of PFO 2. 31.9 ac of PFO 3. 0.08 ac 4. 0.3 ac 5. 4.3 ac 6. 0.1 ac 7. 0.1 ac 8. 0.5 ac 9. 1.9 ac 10. 5.2 ac 11. 1.1 ac 12. 6.3 ac 13. 6.8 ac 14. 0.3 ac

[1] PFO is a palustrine forested wetland
[2] PUB is a palustrine unconsolidated bottom wetland

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.

MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Table 9.3-14 Summary of Waterways on Alternate Sites

	Number of/names of streams	Stream type	Description
Calvert Cliffs 3	A. Johns Creek	A. Perennial	A. 4661 LF
	B. Tributary to the Bay	B. Perennial	B. 2093 LF
	C. Tributary of Johns Creek	C. Perennial	C. 7400 LF
	D. Goldstein Branch	D. Perennial	D. 2051 LF
	E. Tributary of Perrin Branch	E. Intermittent	E. 4517 LF
	F. Tributary of Perrin Branch	F. Perennial	F. 1083 LF
Bainbridge	A. Tributary of Susquehanna River	A. Perennial	A. 2638 LF
	B. Happy Valley Branch	B. Perennial	B. 6016 LF
	C. Tributary of Susquehanna River	C. Perennial	C. 1279
	D. Tributary of Susquehanna River	D. Perennial	D. 312 LF
	E. Tributary of Susquehanna River	E. Perennial	E. 308 LF
	F. Octoraro Creek	F. Perennial	F. 1433 LF
	G. Tributary to Octoraro Creek	G. Perennial	G. 185 LF
EASTALCO	A. Tributary of Tuscarora Creek	A. Perennial	A.2693 LF
	B. Tuscarora Creek	B. Perennial	B. 12319 LF
	C. Tributary of Tuscarora Creek	C. Intermittent	C. 6001 LF
	D. Tributary of Tuscarora Creek	D. Perennial	D. 3399 LF
	E. Tributary of Tuscarora Creek	E. Intermittent	E. 4634 LF
	F. Horsehead Run	F. Intermittent	F. 3898 LF
	G. Tributary of Tuscarora Creek	G. Intermittent	G. 120 LF
	H. Tuscarora Creek	H. Perennial	H. 745 LF
	I. Tributary of Tuscarora Creek	I. Perennial	I. 395 LF
	J. Tributary of Tuscarora Creek	J. Perennial	J. 327 LF
	K. Tributary of Tuscarora Creek	K. Perennial	K. 378 LF
	L. Tributary of Tuscarora Creek	L. Perennial	L. 403 LF
	M. Tributary of Tuscarora Creek	M. Perennial	M. 317 LF
Thiokol	A. Tributary of Burnt Mill Creek	A. Perennial	A. 5430 LF
	B. Rich Neck Creek	B. Perennial	B. 2250 LF
	C. Tributary of Burnt Mill Creek	C. Perennial	C. 312 LF
	D. Horse Landing Creek	D. Perennial	D. 486 LF
	E. Tributary of Persimmon Creek	E. Perennial	E. 332 LF
	F. Persimmon Creek	F. Perennial	F. 324 LF
	G. Tributary of Killpeck Creek	G. Perennial	G. 300 LF
	H. Killpeck Creek	H. Perennial	H. 300 LF
	I. Tributary of Patuxent Creek	I. Perennial	I. 445 LF
	J. Tributary of Patuxent Creek	J. Perennial	J. 354 LF
	K. Tributary of Patuxent Creek	K. Perennial	K. 308 LF
	L. Tributary of Patuxent Creek	L. Intermittent	L. 201 LF
	M. Tributary of Patuxent Creek	M. Perennial	M. 310 LF
	L. Swanson Creek	L. Perennial	L. 379 LF

Sources:
USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed June 17, 2009.
MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

J.1 Onsite Alternatives Analysis

Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material ("Guidelines"), stipulate that no discharge of dredged or fill material into a waters of the United States (including jurisdictional wetlands) shall be permitted if there is a practicable alternative which would have less adverse impact on the aquatic environment, so long as the alternative does not have other significant adverse environmental consequences. Even if an applicant's preferred alternative is determined to be the least environmentally damaging practicable alternative, the Corps must still determine whether the LEDPA is in the public interest. The Corps Public Interest Review (PIR), described at 33 CFR 320.4, directs the Corps to consider a number of factors in a balancing process. A permit will be not be issued for an alternative that is not the LEDPA, nor will a permit be issued for an activity that is determined to be contrary to the public interest. In considering both the LEDPA and the PIR the Corps must consider compliance with other applicable substantive laws such as the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA) as well as consult with other Federal Agencies. The Corps also must follow procedural laws such as National Environmental Policy Act (NEPA), and other applicable laws described in 33 CFR 320.3.

Section 230.10(a) of the Guidelines requires that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." Section 230.10(a)(2) of the Guidelines states that "an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant that could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered." Thus, this analysis is necessary to determine which alternative is the LEDPA that meets the project purpose and need.

Where the activity associated with a discharge is proposed for a special aquatic site (as defined in 40 CFR Part 230, Subpart E), and does not require access or proximity to or siting within these types of areas to fulfill its basic project purpose (i.e., the project is not "water dependent"), practicable alternatives that avoid special aquatic sites are presumed to be available, unless clearly demonstrated otherwise (40 CFR 230.10(a)(3)).

As part of the Corps permit review process, the Corps requested a detailed analysis on the steps taken to minimize UniStar's proposed onsite impacts and to quantify potential permanent and temporary impacts to all waters of the United States, including jurisdictional wetlands, for each onsite project alternative. The onsite analysis does not preclude the necessity to evaluate the alternative site analysis.

UniStar described the site layout study to select an appropriate location on the Calvert Cliffs Nuclear Power Plant (CCNPP) campus for Unit 3 (UniStar 2008). The UniStar layout study, including design options to minimize impacts, evaluated north, south, and west parcel configurations. The criteria and considerations included environmental; security; land use and zoning; construction feasibility; switchyard/transmission lines; impact to existing facilities or structures; and process studies. UniStar also studied aesthetics; wetlands and streams; threatened and endangered species; and areas of historic and archeological resources. According to UniStar's delineation, the Calvert Cliffs campus has approximately 133 acres of wetlands and 94,200 linear feet of streams (UniStar 2008). Table J-1 describes the UniStar delineated potential wetland and stream impact areas for the four studied locations. UniStar determined that its selected south parcel would be the most ecologically sound location of proposed Unit 3.

Table J-1. Wetland and Stream Impact Areas of Onsite Alternatives

Onsite Alternative	Approximate Wetland Impact	Approximate Stream Impact
Option A layout Northern	29.27 ac	9753 linear ft
Option B layout Northern	29.27 ac	9753 linear ft
Option C layout Northern	29.67 ac	11,474 linear ft
UniStar's selected layout Southern	11.7 ac	8350 linear ft

At the request of the Corps, UniStar minimized potential project impacts to waters of the United States, including wetlands. Site layout for this project was based on an extensive site layout study to determine a layout that would most practicably avoid and minimize impacts to Corps jurisdictional waters and wetlands (UniStar 2008). Efforts were made to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and streams and to avoid direct or indirect support of new construction in wetlands and streams wherever there was a practicable alternative. The proposed impacts were further reduced through relocation of or reconfiguration of facility components. Project siting was limited by design constraints, which allowed integration with the existing Units 1 and 2 and exclusion zones. UniStar prepared a summary of the stages of avoidance and/or minimization of potential onsite wetland and stream impacts within the selected southern layout that reduced wetland impacts from the initially proposed 18.6 ac reduced to 11.7 ac by relocating a construction road and the batch plant; reducing impact from stormwater drainage basins; optimizing the switchyard; and refining the wetland delineation (UniStar 2008). Decision options available to the Corps (which embraces all of the applicant's alternatives) are issue the permit; issue with modifications or conditions; or deny the permit.

J.2 References

33 CFR Part 320. Code of Federal Regulations. Title 33, *Navigation and Navigable Waters*, Part 320, “General Regulatory Policies.”

40 CFR Part 230. Code of Federal Regulations, Title 40, *Protection of Environmen*t, Part 230, “Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material.”

Clean Water Act. 33 U.S.C. 1251, *et seq*. (also referred to as the Federal Water Pollution Control Act [FWPCA]).

Endangered Species Act of 1973, as amended (ESA). 16 U.S.C. 1531 *et seq*.

National Environmental Policy Act of 1969, as amended (NEPA). 42 U.S.C. 4321, *et seq*.

National Historic Preservation Act of 1966, as amended (NHPA). 16 U.S.C. 470, *et seq.*

UniStar Nuclear Energy (UniStar). 2008. Letter from Dimitri Lutchenkov (UniStar) to Mr. William Seib (Corp) dated November 11, 2008. “Subject: Joint Federal/State Application of Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, Calvert Cliffs Nuclear Power Plant Site, Lusby, Calvert County, Maryland, USACE Tracking No. NAB-2007-08123-M05”. Accession No. ML091530687.

UniStar Nuclear Energy (UniStar). 2009. Letter from G. Gibson (UniStar) to NRC dated October 15, 2009. “Subject: UniStar Nuclear Energy, NRC Docket No. 52-016, Calvert Cliffs Nuclear Power Plant, Unit 3, Supplemental Response to Environmental Report, RAI No. 1019, U.S. Army Corps of Engineers (USACE), Question No. 1 and No. 5.” Accession No. ML092920352.

Appendix K

UniStar's Phase II Final Mitigation Plan Summary for Wetlands, Streams, and Tidal Waters Impacts

Appendix K
UniStar's Phase II Final Mitigation Plan Summary for Wetlands, Streams, and Tidal Waters Impacts

SUMMARY OF PHASE II COMPENSATORY MITIGATION PLAN FOR NONTIDAL WETLAND, STREAM, AND TIDAL WATERS IMPACTS ASSOCIATED WITH CALVERT CLIFFS UNIT 3

The proposed compensatory "in kind" mitigation for the proposed impacts to wetlands and surface waters of the proposed Unit 3 project at the Calvert Cliffs site is intended to meet the mitigation requirements of the U.S. Army Corps of Engineers (USACE or the Corps) Baltimore District, and includes the creation and enhancement of wetlands and streams to conditions more suitable for use by wildlife species native to the region. Also, tidal water habitat mitigation is proposed to enhance the substrate bottom for aquatic species. Appropriate and practicable steps to minimize adverse impacts were conducted through analysis of multiple site development plan concepts. The nontidal mitigation areas were chosen following a mitigation site selection process. Four general mitigation strategies were initially identified: (1) onsite and in-kind; (2) onsite and not in-kind; (3) offsite and in-kind; and (4) offsite and not in-kind. The mitigation strategy chosen for the proposed Unit 3 project at the Calvert Cliffs site provides for onsite and in-kind mitigation, as this strategy, or mitigation action, would replace nontidal wetland acreage and functional losses more effectively than the other three strategies. The project was designed to adhere to the Code of Maryland Regulations (COMAR) 26.23.04.03. Phase I of this plan was included in the draft environmental impact statement (EIS) for the proposed Calvert Cliffs Unit 3 combined license (NRC 2010). This Phase II summary incorporates updates to the plan as submitted by UniStar to the Corps (UniStar 2009, 2010, 2011a, 2011b).

The Final Phase II Nontidal Wetland and Stream Mitigation Plan was prepared in accordance with "Compensatory Mitigation for Losses of Aquatic Resources: Final Rule" (Mitigation Rule) (33 CFR Parts 325 and 332) dated April 10, 2008. The applicant proposes onsite and in-kind wetland and stream restoration and enhancement as well as tidal water habitat enhancements to mitigate the proposed impacts to the Corps jurisdictional nontidal and tidal waters. The plan proposes to replace functions and values that would be lost with the construction of the proposed project. Tables K-1, K-2 and K-3 at the end of this appendix summarize projected impacts to nontidal wetlands and waters, and acreages of proposed nontidal wetland and stream mitigation actions.

Compensatory mitigation for unavoidable impacts to approximately 11.72 ac of jurisdictional, nontidal forested wetlands, emergent (herbaceous) wetlands, and surface waters (including Camp Conoy Fishing Pond) (USACE and/or MDE jurisdictional); 8350 linear ft of stream habitat; and 4.5 ac of select tidal waters habitat would be required to satisfy the Section 404 standards of the Clean Water Act and to obtain regulatory authorization for Unit 3 construction.

This work includes the enhancement of one manmade, abandoned sediment basin within the Lake Davies Disposal Area; the enhancement of portions of Johns Creek; the creation of forested and herbaceous wetland habitat within the largest manmade abandoned, sediment basin on the Lake Davies disposal area; creation of forested wetland habitat within the Camp Conoy area; stream restoration; and stream enhancement. The wetland mitigation proposes to create open water pond habitat; freshwater marsh; bottomland hardwood forest; eradication of invasive vegetation and enhancement of bottomland hardwood forest; enhancement of wetlands abutting Johns Creek by eradication of invasive vegetation and enhancement of bottomland hardwood forest; and creation of forested wetland habitat. The stream mitigation proposes to restore stream functions along stream portions by employing treatments such as instream habitat structures (cover logs, lateral/longitudinal diversity and root wads); bank stabilization (vegetative and bioengineering solutions); and riparian wetland enhancements (hydraulic and vegetative). The stream mitigation also proposes to enhance specific stream portions by improving aquatic habitat, constructing bank stabilization and planting native riparian vegetation. These projects would be monitored for a 5-year period and would be protected in perpetuity through establishment of a legally binding protection mechanism. Proposed tidal-water mitigation actions are described below:

- Implement tidal mitigation at a 1:1 ratio for 4.5 ac of tidal sand/coarse (NMFS 3020) substrate enhancement to mitigate for the proposed dredging impacts to meet Corps mitigation requirements

- Provide a capped amount of up to $45,000 per acre (in 2008 dollars) to fund the cost of moving, creating or restoring oyster habitat equal to the area of the bottom in Natural Oyster Bar 19-2 that is expected to be impacted, as required by the State of Maryland Certificate of Public Convenience and Necessity (CPCN) (MPSC 2010).

K.1 Wetland Mitigation

After field reconnaissance and site walk-through of the Calvert Cliffs site during 2007 and 2008, including the Unit 3 project area, specific locations were identified as having ecological lift potential for wetland enhancement, or as being suitable for the creation of wetland communities from upland landscape.

Among the group of wetlands that would not be impacted by development of the Unit 3 facility, specific sites were selected that would benefit from mitigation providing for an increase in wetland values and functions. The wetland mitigation actions would include creation and enhancement within the Lake Davies Disposal Area (former sediment settling basins), the portion of Johns Creek to the south of the sediment basins, and an upland grassed field at the Camp Conoy area (wetland creation site). Phragmites (*Phragmites australis*) is found throughout the entire site, especially within the wetland sites proposed for mitigation. By eradicating Phragmites, the wetlands infested with this invasive nuisance species would have uplift for wildlife habitat and other important wetland functions. Increased diversification of native plant species would also be provided by planting these mitigation sites with native bottomland hardwood tree species and/or shrubs. Finally, by removing the Phragmites from the degraded wetlands, a more normal hydrologic regime would be established.

The wetland mitigation component of the compensatory mitigation plan includes the following proposed activities:[MAP1]

- Create forested wetland habitat within the Camp Conoy area that lies within the Chesapeake Bay Critical Area (CBCA) (Mitigation Site WC-1)
- Create palustrine forested and emergent wetland habitats within the middle manmade, abandoned, sediment basin of the Lake Davies Disposal Area (Mitigation Site WC-2)
- Enhance a smaller manmade, abandoned, sediment basin within the Lake Davies Disposal Area (Mitigation Site WE-1)
- Enhance a portion of Johns Creek and a linear drainageway extension occurring to the south of the Lake Davies Disposal Area (Mitigation Site WE-2)
- Eradicate Phragmites through herbicide application and establish a native vegetation community (Mitigation Sites WC-2, WE-1, and WE-2)
- Use soil material from impacted onsite wetland areas that do not contain phragmites as a supplemental growth medium within wetland creation sites (Mitigation Sites WC-1 and WC-2).

Following the onsite wetland creation and wetland enhancement activities for the proposed Unit 3 project, a 5-year annual monitoring program would be implemented in accordance with the requirements of the *Mitigation and Monitoring Guidelines* (USACE) (33 CFR Parts 325 and 332) and the protocols in the *Maryland Compensatory Mitigation Guidance* (Interagency Mitigation Task Force 1994). Furthermore, the monitoring program would be conducted pursuant to the Maryland Department of the Environment (MDE), Water Management Administration mitigation monitoring guidelines and protocols (COMAR 26.23.04).

Mitigation credit ratios for activities designed to replace impacted forested wetlands functions and values are 2:1 for creation and 3:1 for enhancement. The use of a 3:1 mitigation credit ratio for enhancement is based on controlling Phragmites coupled with the planting of native bottomland hardwood species. The credit ratio for the mitigation activity to replace impacted emergent wetlands functions and values is 1:1 for creation and 1:4 for enhancement. UniStar proposes additional mitigation to replace some of the 2.63 ac impact to open waters through forested wetland creation and enhancement.

K.2 Stream Mitigation

The proposed Unit 3 site contains five proposed stream restoration reaches and five proposed stream preservation reaches (perennial and intermittent) onsite. The stream reaches proposed for mitigation activities are primarily contained within the Woodland Branch and Johns Creek watershed, and secondarily in the Camp Conoy area that lies within the CBCA.

The stream mitigation component of the compensatory mitigation plan includes the following proposed activities:

- Restore [MAP2] the stream channel corridor within the onsite portion of upper and lower Woodland Branch;
- Preserve the stream channel within the middle reach of Woodland Branch and two unnamed tributaries;
- Restore the stream channel within an unnamed tributary to and a portion of the mainstem of Johns Creek;
- The preservation of stream channel within an additional unnamed tributary to Johns Creek; and
- Restoreand preserve the stream channel within unnamed tributaries of the Camp Conoy area.

The proposed stream restoration and stream preservation measures are intended to compensate for the unavoidable, direct loss of physical, biological and/or riparian function of impacted streams. Stream restoration would take advantage of opportunities to reconnect channels to their historic flow paths and restore active connection to wooded floodplains. Areas where degraded channels are abandoned would be designed to function as pockets of seasonal wetlands, ephemeral ponds, and oxbow lakes in the riparian zone. Stream preservation activities, intended to improve existing stream physical and ecological functions within the channel's current flow path include bank grading operations and floodplain creation at lower elevations, bank treatments, and native plantings.

The stream restoration and preservation mitigation opportunities, combined with the proposed stormwater management plan, would offset losses to watershed functions by increasing the ability to provide floodwater storage, naturally recharge local aquifers, improve water quality, and maintain stream and riparian functions that support corresponding ecology.

The amount of stream mitigation proposed is based on a mitigation ratio of 1:1 for stream restoration and stream preservation impacts.

K.3 Tidal Waters Mitigation

Compensatory mitigation for unavoidable impacts to approximately 4.5 ac of dredging is necessary for restoration of the existing barge slip. The proposed tidal substrate enhancement measures are intended to compensate for the unavoidable, direct loss of physical and biological function of impacted Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 04-267). Tidal habitat enhancement would involve depositing suitable substrate in 4.5 ac (total) areas to provide improved bottom habitat for spawning, nursery, foraging and/or shelter life stages of aquatic species.

The tidal mitigation would offset impacts to EFH by increasing optimal substrate habitat areas within Chesapeake Bay and/or tributaries to Chesapeake Bay.

Table K-1. Summary of Impacts to Nontidal Wetlands and Waters

Wetland Type	Area of Impact	Impact Type
Forested wetland	7.88 ac	Permanent grading/fill
Emergent wetland	1.21 ac	Permanent grading/fill
Open water	2.63 ac	Permanent grading/fill
Total Area of Permanent Impacts = 11.72 ac		

Table K-2. Summary of Stream Impacts and Proposed Mitigation

Proposed Stream Impacts Total (linear ft)	Required Stream Mitigation (linear ft)	Proposed Stream Mitigation, Totals and Types (linear ft)	Total Surplus Stream Mitigation (linear ft)
8,350	Stream Restoration: 8,350	Stream restoration: 10,236	1,886
	Stream Preservation: None	Stream Preservation: 930	930
Total Surplus = 1,886 + 930 = 2,816 linear ft			

Table K-3. Summary of Nontidal Wetland and Waters Mitigation

Proposed Wetlands and Waters Impact Acreage	Required Mitigation Ratio/Type	Required Wetland and Waters Mitigation	Proposed Wetland/ Waters Mitigation	Acreage Involved in Mitigation	Surplus Wetland/ Waters Mitigation
Forested Wetland: 7.88 ac	1:2 Forested Creation	Forested Creation: 15.76 ac	Forested Creation: 12.26 ac	@1:2 = 12.26 ac	Creation Deficit[a]: 3.5 ac Enhancement Surplus[a]: 4.64 ac **Net Surplus**: **1.14 ac**
	1:4 Forested Enhancement	Forested Enhancement: None	Forested Enhancement: 4.64 ac	@1:4 = 18.54 ac	
Emergent Wetland: 1.21 ac	1:1 Emergent Creation	Emergent Creation: 1.21 ac	Emergent Creation: 1.61 ac	@1:1 = 1.61 ac	Creation Surplus: 0.40 ac Enhancement Surplus: 0.27 ac **Net Surplus: 0.67 ac**
	1:4 Emergent Enhancement	Emergent Enhancement: None	Emergent Enhancement: 0.27 ac	@1:4 = 1.08 ac	
Open Water: 2.63 ac	--	Open Water Creation: 2.63 ac	Open Water Creation: 0.90 ac	0.90 ac	**Deficit:** 1.73 ac
Total (all types): 11.72 ac	**--**	**Total (all types): 19.60 ac**	**Total (all types): 19.68 ac**	**Total (all types): 34.39 ac**	**Overall Surplus: 0.08 ac**

(a) Note: 2.63 ac of open water being mitigated as forested mitigation and are included in the forested wetland creation and enhancement totals.

The Phase II Final Mitigation Plan for Wetlands, Streams, and Tidal Waters Impacts will be included in the Corps permit decision and is available for review and inspection (although not for distribution) at:

U. S. Army Corps of Engineers, Baltimore District
Operations Division, Regulatory Branch
City Crescent Building
10 South Howard Street
Baltimore, MD 21201

Note: Please contact either Mr. Woody Francis, Regulatory Project Manager, by e-mail at woody.francis@usace.army.mil or phone number (410) 962-5689, or Ms. Melody Quinn at 410-962-4500 to make arrangements for reviewing the Mitigation Plan.

K.4 Reference

33 CFR Part 325. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters,* Part 325, "Processing of Department of the Army Permits."

33 CFR Part 332. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters,* Part 332, "Compensatory Mitigation for Losses of Aquatic Resources."

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UniStar Nuclear Energy (UniStar). 2011b. Letter from D Lutchenkov (UniStar) to W. Francis (USACE), “Subject: Final Phase II Nontidal Wetland and Stream Mitigation Plan for Calvert Cliffs Nuclear Power Plant, Unit 3.” April 18, 2011. Accession No. ML111190230.

U.S. Nuclear Regulatory Commission (NRC). 2010. *Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3—Draft Report for Comment.* NUREG-1936, volumes 1 and 2. Washington, D.C. Accession Nos. ML101000012 and ML101000013.

Appendix L

Carbon Dioxide Footprint Estimates for a 1000-MW(e) Reference Reactor

Appendix L

Carbon Dioxide Footprint Estimates for a 1000-MW(e) Reference Reactor

The review team has estimated the carbon dioxide (CO_2) footprint of various activities associated with nuclear power plants. These activities include building, operating, and decommissioning the plant. The estimates include direct emissions from the nuclear facility and indirect emissions from workforce transportation and the uranium fuel cycle.

Construction equipment estimates listed in Table L-1 are based on hours of equipment use estimated for a single nuclear power plant at a site requiring a moderate amount of terrain modification. Equipment usage for a multiple unit facility would be larger, but it is likely that it would not be a factor of 2 larger. A reasonable set of emissions factors used to convert the hours of equipment use to CO_2 emissions are based on carbon monoxide (CO) emissions (UniStar 2007) scaled to CO_2 using a scaling factor of 165 tons of CO_2 per ton of CO. This scaling factor is based on emissions factors in Table 3.3-1 of AP-42 (EPA 1995). Equipment emissions estimates for decommissioning are one-half of those for construction.

Table L-1. Construction Equipment CO_2 Emissions (metric tons equivalent)

Equipment	Construction Total[(a)]	Decommissioning Total[(b)]
Earthwork and Dewatering	1.1×10^4	5.4×10^3
Batch Plant Operations	3.3×10^3	1.6×10^3
Concrete	4.0×10^3	2.0×10^3
Lifting and Rigging	5.4×10^3	2.7×10^3
Shop Fabrication	9.2×10^2	4.6×10^2
Warehouse Operations	1.4×10^3	6.8×10^2
Equipment Maintenance	9.6×10^3	4.8×10^3
TOTAL[(c)]	3.5×10^4	1.8×10^4

(a) Based on hours of equipment usage over 7-yr period.
(b) Based on equipment usage over 10-yr period.
(c) Total not equal to the sum due to rounding.

Workforce estimates are typical workforce numbers for new plant construction and operation based on estimates in various combined license applications, and decommissioning workforce emissions estimates are based on decommissioning workforce estimates in NUREG-0586 S1, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1 Regarding the Decommissioning of Nuclear Power Reactors* (NRC 2002). A typical construction workforce averages about 2500 for a 7-year period with a peak workforce of about 4000. A typical operations workforce for the 40-year life of the plant is assumed to be about 400, and the decommissioning workforce during a decontamination and dismantling period of 10 years is assumed to be 200 to 400. In all cases, the daily commute is assumed to involve a 100-mi roundtrip with 2 individuals per vehicle. Considering shifts, holidays, and vacations,1250 roundtrips per day are assumed each day of the year during construction, 200 roundtrips per day are assumed each day during operations, and 150 roundtrips per day are assumed 250 days per year for the decontamination and dismantling portion of decommissioning. If the SAFSTOR decommissioning option is included in decommissioning, 20 roundtrips each day of the year are assumed for the caretaker workforce.

Table L-2 lists the review team's estimates of the CO_2 equivalent emissions associated with workforce transport. The table lists the assumptions used to estimate total miles traveled by each workforce and the factors used to convert total miles to metric tons CO_2 equivalent. CO_2 equivalent accounts for other greenhouse gases, such as methane and nitrous oxide that are emitted by internal combustion engines. The workers are assumed to travel in gasoline-powered passenger vehicles (cars, trucks, vans, and SUVs) that get an average of 19.7 mi per gallon of gas (FHWA 2006). Conversion from gallons of gasoline burned to CO_2 equivalent is based on U.S. Environmental Protection Agency (EPA) emissions factors (EPA 2007a, 2007b).

Table L-2. Workforce CO_2 Footprint Estimates

	Construction Workforce	**Operational Workforce**	**Decommissioning Workforce**	**SAFSTOR Workforce**
Roundtrips per day	1250	200	150	20
Miles per roundtrip	100	100	100	100
Days per year	365	365	250	365
Years	7	40	10	40
Miles traveled	3.2×10^{8}	2.9×10^{8}	3.8×10^{7}	2.92×10^{7}
Miles per gallon[(a)]	19.7	19.7	19.7	19.7
Gallons fuel burned	1.6×10^{7}	1.5×10^{7}	1.9×10^{6}	1.58×10^{6}
Metric tons CO_2 per gallon[(b)]	8.81×10^{-3}	8.81×10^{-3}	8.81×10^{-3}	8.81×10^{-3}
Metric tons CO_2	1.4×10^{5}	1.3×10^{5}	1.7×10^{4}	1.3×10^{4}
CO_2 equivalent factor[(c)]	0.971	0.971	0.971	0.971
Metric tons CO_2 equivalent	1.5×10^{5}	1.3×10^{5}	1.7×10^{4}	1.3×10^{4}

(a) FHWA 2006
(b) EPA 2007b
(c) EPA 2007a

Published estimates of uranium fuel cycle CO_2 emissions required to support a nuclear power plant range from about 1 percent to about 5 percent of the CO_2 emissions from a comparably sized coal-fired plant (Sovacool 2008). A coal-fired power plant emits about 1 metric ton of CO_2 for each megawatt hour generated (Miller and Van Atten 2004). Therefore, for consistency with Table S-3 of Title 10 of the Code of Federal Regulations (CFR) Part 51.51, the NRC staff estimated the uranium fuel cycle CO_2 emissions as 0.05 metric tons of CO_2 per MWh generated and assumed an 80 percent capacity factor. Finally, the review team estimated the CO_2 emissions directly related to plant operations from the typical usage of various diesel generators on site using EPA emissions factors (EPA 1995). The review team assumed an average of 600 hours of emergency diesel generator operation per year (total for 4 generators) and 200 hours of station blackout diesel generator operation (total for 2 generators).

Given the various sources of CO_2 emissions discussed above, the review team estimates the total life CO_2 footprint for a reference 1000-MW(e) nuclear power plant with an 80-percent capacity factor to be about 18 million metric tons. The components of the footprint are summarized in Table L-3. The uranium fuel cycle component of the footprint dominates all other components. It is directly related to power generated. As a result, it is reasonable to use reactor power to scale the footprint to larger reactors.

Table L-3. Reference Reactor Lifetime Carbon Dioxide Footprint

Source	Activity Duration (yr)	Total Emissions (metric tons)
Construction Equipment	7	3.5×10^4
Construction Workforce	7	1.5×10^5
Plant Operations	40	1.9×10^5
Operations Workforce	40	1.3×10^5
Uranium Fuel Cycle	40	1.7×10^7
Decommissioning Equipment	10	1.8×10^4
Decommissioning Workforce	10	1.7×10^4
SAFSTOR Workforce	40	1.3×10^4
TOTAL		1.8×10^7

In closing, the review team considers the footprint estimated in Table L-3 to be appropriately conservative. The CO_2 emissions estimates for the dominant component (uranium fuel cycle) are based on 30-year-old enrichment technology, assuming that the energy required for enrichment is provided by coal-fired generation. Different assumptions related to the source of energy used for enrichment or the enrichment technology that would be just as reasonable could lead to a significantly reduced footprint.

Emissions estimates presented in the body of this environmental impact statement (EIS) have been scaled to values that are appropriate for the proposed project. The uranium fuel cycle emissions have been scaled by reactor power using the scaling factor determined in Chapter 6 of this EIS and by the number of reactors to be built. Plant operations emissions have been adjusted to represent the number of large CO_2 emissions sources (e.g., diesel generators, boilers) associated with the project. The workforce emissions estimates have been scaled to account for differences in workforce numbers and commuting distance. Finally, equipment emissions estimates have been scaled by estimated equipment usage. As shown in Table L-3, only the scaling of the uranium fuel cycle emissions estimates makes a significant difference in the total carbon footprint of the project.

L.1 References

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

Federal Highway Administration (FHWA). 2006. *Highway Statistics 2005* (Table VM-1). Washington, D.C.

Miller, P.J. and C. Van Atten. 2004. *North American Power Plant Air Emissions*. Commission for Environmental Cooperation of North America, Montreal.

Sovacool, B.K. 2008. "Valuing the greenhouse gas emissions from nuclear power: A critical survey." Energy Policy 36:2940-2953.

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U.S. Environmental Protection Agency (EPA). 1995. *Compilation of Air Pollutant Emission Factors Volume 1: Stationary and Point and Area Sources*. AP-42, 5th Ed. Research Triangle Park, North Carolina.

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U.S. Environmental Protection Agency (EPA). 2007b. "Conversion Factors to Energy Units (Heat Equivalents) Heat Contents and Carbon Content Coefficients of Various Fuel Types." In *Inventory of U.S. Greenhouse Gas Emissions and Sinks: Fast Facts 1990-2005*. EPA-430-R-07-002. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2002. *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1 Regarding the Decommissioning of Nuclear Power Reactors.* NUREG-0586 S1, Vol. 1, Washington, D.C.

Appendix M

UniStar Responses to Comments Received by the U.S. Army Corps of Engineers from the Draft Environmental Impact Statement's Public Notice

Appendix M

UniStar Responses to Comments Received by the U.S. Army Corps of Engineers from the Draft Environmental Impact Statement's Public Notice

In accordance with 33 CFR 325.2(a)(3) of the U.S. Army Corps of Engineers' (Corps') regulations, if the District determines, based on comments received in response to the public notice, that the views of the applicant on a particular issue is necessary to make a public interest determination, the applicant will be given the opportunity to furnish views on such issues. The Corps has provided UniStar with the opportunity to furnish resolutions or rebuttals of all objections and comments. The Corps will evaluate and consider comments, objections, and rebuttals as part of the permit review process. The Corps alone is responsible for reaching a decision on the merits of any application.

The Corps will base its evaluation of the Department of the Army Individual Permit application on the requirements of Corps regulations, the Clean Water Act Section 404(b)(1) Guidelines, and the Corps' public interest review process. The Corps' permit decision will be made in its Record of Decision.

Greg Gibson
Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202

UniStar
NUCLEAR ENERGY

November 19, 2010

UN#10-293

Woody Francis, Project Manager
U.S. Army Corps of Engineers – Baltimore District
10 S. Howard Street
Baltimore, Maryland 21201

Subject: UniStar Response to Selected Comments on the Calvert Cliffs Nuclear Power Plant, Unit 3 Draft Environmental Impact Statement (EIS)

The purpose of this letter is to respond to selected comments submitted to the Nuclear Regulatory Commission (NRC) and the U.S. Army Corps of Engineers (ACOE) relating to the Calvert Cliffs Nuclear Power Plant (CCNPP), Unit 3, Draft Environmental Impact Statement (Draft EIS) published by the NRC in April, 2010.

Geologic

A comment was submitted that Dr. Susan Kidwell and Dr. Thomas Vogt suggest that additional geologic studies should have been performed. This comment is apparently related to the Safety Evaluation Report (SER) portion of the Combined License Application (COLA) and not to the Environmental Report (ER) portion of the COLA. As such, the comment is not related to environmental impacts of either the issuance of a Combined Operating License or a Wetlands Permit. Rather, the comment is a "safety" comment as addressed by the Nuclear Regulatory Commission as stated in the Draft EIS, Sect. 2.8:

> '*Considering the geological characteristics of the site and vicinity are essential to the safe design and operation of the plant, but building and operating the plant does not have a significant environmental impact on geological resources. . . .*'
>
> *Draft EIS, § 2.8 at 2-131.*

Notwithstanding the above, UniStar notes that the statements of both Dr. Kidwell and Dr. Vogt were that the geologic study could have been broader in scope. UniStar notes that the site characterizations performed met or exceeded all requirements in applicable Federal requirements, including NRC Regulatory Guide, 1.206 and the NRC Standard Review Plan, NUREG-0800.

As stated in the Draft EIS, a detailed description of the geological, seismological and geotechnical conditions at the CCNPP site was provided in Section 2.5 of the UniStar Final Safety Analysis Report (FSAR) *(Draft EIS, Sect. 2.8)*. As stated in the FSAR, as part of the

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comprehensive site investigations performed, UniStar engaged Bechtel to conduct a review of previously published reports on geology and seismology with respect to the Calvert Cliffs site, including published geologic literature which updates the existing geological and seismological information and unpublished geologic literature, studies and projects identified through the U.S. Geological Survey.

UniStar also engaged the nationally respected William Lettis and Associates to conduct field investigations of regional and site tectonics and structural geology, which included field reconnaissance of the site and within a 25 mile radius. Geologists in teams of two or more visited the site in late summer and autumn 2006 and focused on exposed portions of the Calvert Cliffs, other cliff exposures along the west shore of the Chesapeake Bay and roads traversing the site within a 5 mile radius. Aerial reconnaissance within a 25 mile radius of the site was conducted by two geologists in 2007, to determine the geomorphology of the Chesapeake Bay area and to target numerous previously mapped geologic features and potential seismic sources within a 200 mile radius of the CCNPP site (e.g., Mountain Run fault zone, Stafford fault system, Brandywine fault zone, Port Royal fault zone and Skinkers Neck anticline). *FSAR, Sect. 2.5, at 2-1051 - 1052.*

Dr. Kidwell was interviewed by John Baldwin of William Lettis and Associates, during which she discussed her theory of "the ***postulated*** fault at Moran Landing and possible structural control of drainage patters in Southern Maryland." [emphasis added] *(Testimony of Dr. Susan Kidwell, Maryland Public Service Commission, Case No. 9218, April 19, 2010, p. 103 (line 15) – p. 104 (line 21)).* Accordingly, input from Dr. Kidwell and Dr. Vogt was formally evaluated and considered by William Lettis and Associates and Bechtel during the investigative and analytical phases of the site characterizations. However, no confirmatory evidence of a postulated fault was identified from the detailed site reconnaissance, despite repeated attempts.

In summary, UniStar concludes the Draft EIS is complete and accurate, and appropriately concludes that the construction and operation of CCNPP Unit 3 will not impact geological resources.

Water Resources

A concern apparently has been made that authorization by the Maryland Public Service Commission (MPSC) to utilize groundwater from the Aquia aquifer could cause residential wells to "run dry" and that excessive draw down of the aquifer could exacerbate the arsenic levels that have been detected in the aquifer. UniStar conducted detailed utilization studies of groundwater which were evaluated in depth during the original MPSC proceedings, and resulted in the MPSC issuing a Certificate of Public Convenience and Necessity (CPCN) specifically authorizing groundwater withdrawal.

Under Maryland law, the MPSC has exclusive authority to authorize groundwater use by proposed electric generating stations, but it does so in consultation with the Power Plant Research Program (PPRP) of the Maryland Department of Natural Resources and the Maryland Department of the Environment. *Md. Code, Public Utilities Commission § Art. 7-208(h)(1); See also Envt. Art. 5-502(e); Nat. Res. 3-306(a).*

The Environmental Review Document submitted in the MPSC proceedings by PPRP specifically concluded that UniStar's proposed withdrawal will result in very small drawdown amounts (15 – 17.3 feet at distances up to 3.5 miles, 5 years into usage) as compared to the available drawdown calculated pursuant to Maryland regulations (254 feet). On that basis, the state authorities concluded that "the drawdown in the Aquia will not cause an unreasonable impact to

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the nearby users for the limited five year period of construction for Unit 3." Environmental Review Document at 6-23, MPSC Case No. 9127, July 2008.

On the basis of the minimal projected drawdown, UniStar agrees with the NRC conclusion in the Draft Environmental Impact Statement that UniStar's use of groundwater would have no significant impact. *Draft EIS, § 5.2.2.2 at 5-5, and § 5.2.3.2 at 5-7.*

Air Impacts

Comments have apparently been made that water from the Chesapeake Bay has been tested for salinity and at times had Total Dissolved Solids (TDS) (primarily salt) at levels as high as 20,000 ppm, but the annual emissions of particulates were based on an assumed salinity level of 17,500 ppm. As PPRP pointed out in its Environmental Review Document submitted in the original proceedings, and relied upon by the MPSC in its issuance of a Certificate of Public Convenience and Necessity, salinity will be controlled by UniStar by controlling the "cycles of concentration" of the intake water.

The final conditions of the CPCN allow up to 35,000 ppm TDS, which would result if the intake water contained 17,500 ppm of TDS and went through two cycles, thus becoming doubly concentrated with TDS. If the TDS concentration of the intake water were lower, more cycles of concentration could potentially occur without exceeding the 35,000 ppm TDS level. Similarly, if the intake water had a higher concentration than the assumed 17,500, UniStar could control the final concentration by managing the cycles of concentration. Thus, it does not matter whether the Chesapeake Bay water sometimes has TDS concentrations higher than 17,500 ppm so long as the emissions limit is met by managing the cycles of concentration.

Importantly, an emission limit is set in CPCN Condition 77, which establishes maximum daily and annual emissions of particulate matter (PM, PM10 and PM 2.5). The CPCN does not set a maximum TDS concentration, but rather allows UniStar to manage to the concentration that assures the PM limit is met.

UniStar notes the MPSC has exclusive authority to issue air emissions approvals pursuant to the Federal Clean Air Act, Prevention of Significant Deterioration (PSD) permit program. *Baltimore Gas and Electric Co. v. Dept. of Health and Mental Hygiene, 284 Md. 216, 231 (1979)* ("The overall [regulatory scheme] is for the Public Service Commission to be vested with the sole power and authority to approve on behalf of the State of Maryland the erection of electric generating stations. This approval includes all matters involving or concerned with environmental impact.")(emphasis added). The CPCN statute provides that the grant of a CPCN "constitutes . . . registration and a permit to construct, as required under Title 2, Subtitle 4 of the Environment Article." *Md. PUC Art. 7-208(h)(2).* Accordingly, the CPCN serves also as the construction permit required under the Federal New Source Review program. *47 Fed. Reg. 7834, Approval of Revision of the Maryland State Implementation Plan (February 23, 1982).* PSD approvals have been determined to be the "functional equivalent" of National Environmental Policy Act (NEPA) review by the federal courts. *Portland Cement Association v. Ruckelshaus, 486 F.2d 375 (DC Cir. 1973).* Thus, in the DEIS the NRC relied on the extensive review of the air quality impacts of operation of the proposed Unit 3 that were conducted by PPRP to conclude that the air impacts from operation of Unit 3 would be minimal.

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Noise

Comments have apparently been made regarding UniStar noise studies because they considered a "leaf off" scenario, but not a "cleared" scenario, and because the study centered around the cooling tower for the plant.

UniStar conducted significant studies of projected noise from the Project. The studies were conducted by a noise specialist, Hessler Associates. The noise assessment consisted of measuring and documenting baseline or existing conditions, predicting noise emissions from the existing and planned facilities, assessing any potential impact during construction and operation of the planned expansion and demonstrating compliance with the state regulatory limits for noise. The studies considered seven potentially sensitive residential receptor locations.

Hessler predicted operational noise emissions on the basis of computer noise modeling for the plume-abated cooling tower, which it determined would be the major acoustic source from the planned Project. Hessler concluded that the project at the Calvert Cliffs site can and will be acoustically designed to comply with the requirements of Maryland law regulating industrial noise emissions. Further, construction and operational noise from the project will meet all applicable regulations without restrictions or exceptions. Preliminary Environmental Noise Assessment, Hessler Associates, Inc. May 2008. *See MPSC Case No. 9127, Technical Report, Appendix A, Volume 8, July 2008.*

On the basis of the above studies, the Power Plant Research Program determined that the Project would meet applicable noise requirements. UniStar agrees with the PPRP conclusion because the "leaf off" scenario is comparable to a "cleared scenario" and because, in noise studies, the dominant noise source controls the projected noise level. Therefore, not modeling the smaller, less significant sources of noise besides the cooling tower, is unlikely to affect the outcome. As the PPRP explained in its Environmental Review Document, Section 3.6.1, filed in the MPSC proceedings:

> *'Because sound levels are expressed as relative intensities, multiple sound sources are not directly additive. Rather, the total noise is primarily a result of the source of highest intensity. For example, two sources, each having a noise rating of 50 dBA, will together be heard as 53 dBA; a source of 65 dBA combined with a source of 85 dBA will result in a noise level of 85.1 dBA. As the intensity difference between the two sources increases, the effects of the lower sound sources become negligible.'*

In addition, PPRP conducted an independent analysis of potential noise impacts from both construction and operation of the proposed Calvert Cliffs Unit 3 and concluded that regulatory requirements for noise would be met. Specifically, Section 7.4 of the Environmental Review Document states:

> *'There is a large buffer distance available between the areas of disturbance during construction and the property boundaries where potential noise receptors are located. As a result, the construction noise is projected to comply with State regulatory limits for allowable noise at the site boundary, and no adverse impacts to the community are anticipated.*
>
> *Continuous noise at the facility during operation will be significantly less than during peak construction. The primary noise source will be the hybrid mechanical cooling tower, but due to the distance buffer between the noise*

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source and the nearest receptors, the cooling tower is projected to comply with all applicable noise limits. To ensure that noise impacts from the cooling tower are acceptable, PPRP is recommending a licensing condition that requires UniStar to conduct noise monitoring after the plant becomes operational, at the plant boundaries in locations of closest proximity to residentially zoned land.'

In addition, UniStar will be required by Condition 55 of the final CPCN to conduct post-construction noise testing to demonstrate compliance with State regulatory limits.

<u>Summary</u>

UniStar is pleased to provide this discussion of the facts and circumstances of selected concerns about the Draft EIS to the U.S. Army Corps of Engineers – Baltimore District. UniStar has diligently met the regulatory requirements and guidance for carefully and thoroughly characterizing and evaluating all aspects of the proposed project, including but not limited to, the geological, seismic, hydrological, water quality, air emissions, and noise impacts. UniStar supports and concurs with the independent evaluation and conclusions of the U.S. Nuclear Regulatory Commission in the Draft EIS.

If you have any questions concerning the attached document, please call Mr. Dimitri Lutchenkov at (410) 470-5524.

Sincerely,

Greg Gibson

cc: Susan Gray – Power Plant Research Program
Laura Quinn – NRC

M.1 References

33 CFR Part 325. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters*, Part 325, “Processing of Department of the Army Permits.”

Clean Water Act of 1972. 33 U.S.C. 1251, *et seq.* (also referred to as the Federal Water Pollution Control Act of 1972 [FWPCA]).

NRC FORM 335 (12-2010) NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

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(See instructions on the reverse)

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Office of New Reactors
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10. SUPPLEMENTARY NOTES

Docket 52-016

11. ABSTRACT *(200 words or less)*

This environmental impact statement (EIS) has been prepared in response to an application submitted to the U.S. Nuclear Regulatory Commission (NRC) by Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (collectively referred to as UniStar) for a combined license (COL). UniStar also submitted a joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland to the U.S. Army Corps of Engineers (Corps). The Corps is a cooperating agency on this EIS. This EIS includes the analysis by the NRC and Corps staff that considers and weighs the environmental impacts of constructing and operating a new nuclear unit at the Calvert Cliffs site and at alternative sites, and migitation measures available for reducing or avoiding adverse impacts.

After considering the environmental aspects of the proposed NRC action, the NRC staff's recommendation to the Commission is that the COL be issued as requested. This recommendation is based on (1) the application, including the envrionmental report (ER), submitted by UniStar and responses to requests to additional information; (2) consultation with Federal, State, Tribal, and local agencies; (3) the staff's independent review; (4) the staff's consideration of comments related to the environmental review that were received during the public scoping process and on the draft EIS; (5) the assessments summarized in the EIS, including the potential mitigation measures identified in the ER and this EIS. The Corps' permit decision will be made after the issuance of the final EIS.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

combined license, combined license application, COL, COLA
Calvert Cliffs Unit 3
final environmental impact statement, FEIS, EIS
environmental review
National Emvironmental Policy Act, NEPA
Calvert Cliffs 3 Nuclear Project, UniStar Nuclear Operating Services, UniStar

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