Appendix H
UniStar Data Request Responses
Utilized in Preparing the
October 24, 2008 Filing

Response to DNR Data Request No. 13
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
August 20, 2008

Question 13-1

In reference to Section 2.3.1 and Table 2.3-1 in UniStar's Revised Technical Report dated 8 August 2008:

a. The total water demand from the Chesapeake Bay indicated in the text and table do not reflect the 5% contingency added to the total demand to account for any changes during detailed design, which was included in UniStar's August 4, 2008 response to DNR Data Request No. 10-1. What is the rationale for not including the contingency in the Technical Report, and ensuring consistency with UniStar's revised surface water appropriation request submitted on July 15, 2008?

b. Rev. 1 of Table 2.3-1 does not include corrected values for several water streams under the average flow column, including desalinated water demand, and Chesapeake Bay water demand. Please submit a corrected version of the table.

RESPONSE

a. The intent in Table 2.3-1 is to list developed numbers that can be verified from design basis information. The 5% contingency is added to the "Chesapeake Bay Water Demand" value outside of the table for determining a reasonable water appropriation value. This will allow for the cap on water appropriations while accommodating specific value changes in Table 2.3-1 that may occur as the design matures.

   Note "n" will be added to Table 2.3-1 to capture the 5% contingency included in the "Application to Appropriate and Use Waters of the State" form located in Appendix C of the Technical Report. The note will read as follows:

   > n. This value differs from that in the associated "Application to Appropriate and Use Waters of the State" by 5%. The 5% is a contingency added to account for any changes resulting from detailed design basis.

b. A review of the values in Rev. 1 of Table 2.3-1 has not identified any incorrect values.

Response to DNR Data Request No. 13
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
August 20, 2008

Question 13-2

In reference to Section 5.4.1.2 in UniStar's Revised Technical Report dated 8 August 2008, page 5-11 indicates that the desalinated Chesapeake Bay water would be available for construction in year six, rather than year five, as previously indicated by UniStar in footnote "f" in previous versions of Table 5.4-1 (most recent version dated July 15, 2008). However, in other sections of the 8 August 2008 revised report, the text indicates that the proposed desalination plant will supply freshwater during construction during year five (p. 5-9 and p. 5-24). Please resolve this inconsistency in the 8 August 2008 Revised Technical Report. Please confirm the year in which the desalination plant is expected to be operational.

RESPONSE

The desalination plant is anticipated to be completed and operational approximately six months before the Unit 3 Commercial Operation Date (COD). Those last two quarters of construction are slated for the commissioning process of the unit. During the commissioning period, the flow will be sporadic with priority given to the operating systems (not construction). The Technical Report should be revised as follows:

a. The note in Table 5.4-1 will be changed (change identified in red text) to reflect this milestone as follows:

f) Water for construction would largely come from the existing onsite groundwater production wells. For construction years 1-4, the construction water would be supplied by a combination of onsite well water, trucked in supply, and storage tanks. The desalination plant is anticipated to be operational to meet freshwater supply needs during the last two quarters of construction year six.

b. Section 5.4 will be changed (change identified in red text) to reflect this milestone as follows:

5.4 IMPACTS OF CONSTRUCTION ON HYDROLOGY
The following sections describe the hydrologic alterations and water use impacts that result from the construction of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3. Section 5.4.1 describes the hydrologic alterations resulting from construction activities including the physical effects of these alterations on other users, the best management practices to minimize any adverse impacts and how the project will comply with the applicable Federal, State and local standards and regulations. Section 5.4.2 describes the potential changes in water quality and an evaluation of the impacts resulting from construction activities on water quality, availability, and use.

In summary, Co-Applicants seek permission to use excess groundwater not currently being used by CCNPP Units 1 and 2 under State Water Appropriation and Use Permit No. CA69G-010(05). CCNPP Units 1 and 2 have consented to Co-Applicants' use of these previously authorized withdrawals and Calvert Cliffs Nuclear Power Plant, Inc. will simultaneously seek conforming modification of its groundwater appropriation permit. Any additional freshwater needed during construction will be trucked to the site and stored in temporary water storage tanks. The Co-Applicants are also considering the feasibility of using water recovered from dewatering activities (associated with foundation excavations) to supply additional freshwater during construction. By the last two quarters of the ~~fifth~~ sixth year of construction activity, the proposed desalination plant will supply freshwater needs during construction. Also, the Co-Applicants are questing authorization to withdraw additional groundwater during the construction CCNPP 3.

c. Section 5.4.1.2 will be changed (change identified in red text) to reflect this milestone as follows:

5.4.1.2 Water Sources and Amounts Needed for Construction
As shown in Table 5.4-1, construction activities for CCNPP Unit 3 are estimated to require an average of approximately 71,500 gpd (270,657 lpd) for year one of construction, and an average of approximately 116,500 gpd (441,000 lpd) for years two through six of construction. During periods of peak demand, it is estimated that up to 1,200 gpm may be required for construction personnel needs, concrete manufacturing, dust control, hydrostatic testing, and other construction related activities.

The potential sources of water for construction include (1) available onsite groundwater obtained through up to two new production wells in the Aquia aquifer, (2) available onsite groundwater under the CCNPP Units 1 and 2 current appropriation limits not required for normal operation, (3) water collected during dewatering of onsite excavations for use in dust control, (4) desalinated Chesapeake Bay water from the Desalination Plant in the last two quarters of construction year six, and (5) offsite water trucked to the construction site and stored until used. Table 5.4-1 shows the estimated amounts of fresh water needed by construction year. The water use estimates are based on an expected maximum number of construction workers and extensive dust control in all construction years, and therefore should be considered high estimates of actual water use. The current CCNPP Units 1 and 2 groundwater usage varies markedly but averaged 387,000 gpd (1,465,000 lpd) from July 2001 through June 2006 as shown in Table 5.4-2. The current groundwater appropriations allow for a daily average of 450,000 gpd (1,700,000 lpd) with a limit of 865,000 gpd (3,270,000 lpd) daily average for the month of maximum use as shown in Table 5.4-3. If the Commission approves the Co-Applicants' use of the remainder of CCNPP Units 1 and 2's previous water appropriation, CCNPP Unit 3 will draw (using the proposed new production wells in the Aquia aquifer) a portion of this excess water leaving Units 1 and 2 with adequate margin for continued operation. On average, 63,000 gpd should be available from the daily water appropriation not used by Units 1 and 2 to support Unit 3 construction needs.

The Co-Applicants are also considering the feasibility of using water recovered from dewatering activities (associated with foundation excavations) to provide for certain construction water needs, particularly dust control, and possibly for use by the concrete plants. Dust control requirements should also decrease in later years as structures are completed and disturbed earth stabilized. Dewatering of the excavation sites will generate on average 75,000 gpd (284,000 lpd) with as much as 100,000 gpd (379,000 lpd). This water will be considered as the source for the 40,000 gpd (151,000 lpd) that may be required for dust control. The dewater volume will be stored in tanks or impoundments and transferred to watering trucks or pumping system for applying to exposed soils and road surfaces. These water sources will eventually be replaced upon commissioning and start-up when the onsite Desalination Plant is completed and is able to supply the necessary water for the remaining construction activities. The design of the desalination Plant is to provide 1,750,000 gpd (6,624,470 lpd).

Water will also be trucked to the site and stored in temporary storage tanks for use when needed. Further refinements in the construction water needs may confirm the need of an additional authorization.

d. Section 5.4.2.4 will be changed (change identified in red text) to reflect this milestone as follows:

5.4.2.4 Water Quantities Available to Other Users
At present no surface water withdrawals are made in Calvert County for public potable water supply. Water use projection in Maryland for 2030 does not include surface water as a source for public water supply in southern Maryland counties including Calvert County. Groundwater use and trends in southern Maryland and at the CCNPP site are presented in Section 4.4.2.

As shown in Table 5.4-1, construction activities for CCNPP Unit 3 are estimated to require an average of approximately 71,500 gpd (270,657 lpd) for year one of construction, and an average of approximately 116,500 gpd (441,000 lpd) for years two through six of construction. This water is expected to come from (1) available onsite ground water under the CCNPP Units 1 and 2 current appropriation limits, (2) water collected during dewatering of onsite excavations for use in dust control, (3) desalinated Chesapeake Bay water from the Desalination Plant in the last two quarters of construction year~~s five and~~ six, (4) offsite water trucked to the construction site, and (5) additional wells for use as a temporary source of water.

The surficial aquifer is not used as a potable water source in the vicinity of the CCNPP site. The impacts expected from foundation dewatering or other construction activities will not impact any local users. The Camp Conoy facilities include four wells authorized under MDE water appropriation permit CA63AG003. These wells draw from the Piney Point aquifer and have an appropriation limit of 500 gpd (1,900 lpd). These wells are expected to be abandoned. The impact on the local water supply resulting from any abandonment of these wells will be minor.

Response to DNR Data Request No. 13
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
August 20, 2008

Question 13-6

The rebuttal testimony of UniStar witness George Vanderheyden (page 19, lines 13-16) indicates that UniStar is proposing that the excess water to be conveyed from the existing Units 1 and 2 ground water appropriation be taken from the wells to be constructed for Unit 3. To support this proposed approach to providing ground water for construction of Unit 3, please provide a revised ground water appropriation request for Unit 3 reflecting the following limits:

- Average Daily Use. The annual average water requirement is 100,000 gpd from the Aquia Aquifer; and
- Month of Maximum Use. The maximum daily water use is 180,000 gpd from the Aquia Aquifer for the month of maximum use.

RESPONSE

The requested "Application to Appropriate and Use Waters of the State" form is attached. The form has been updated to reflect revisions in the requested appropriation amounts.

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Water Management Administration - Water Rights Division
1800 Washington Blvd. • Baltimore, Maryland 21230
(410) 537-3591 • 1-800-633-6101 • http://www.mde.state.md

APPLICATION TO APPROPRIATE AND USE WATERS OF THE STATE

☒ New Application ☐ Change in Existing Permit Application Number __________

APPLICATION

Calvert Cliffs 3 Nuclear Project, LLC — 410-470-5857
(Owners Name) (Daytime Phone Number)

750 E. Pratt Street, Baltimore Maryland 21202
(Mailing Address) (Street) (City) (State) (Zip Code)

WITHDRAWAL of GROUNDWATER

Appropriate and use an annual average of 100,000 Gallons per day, and
(Total Annual Use / 365)

180,000 gallons per day during
(Highest Monthly Use / 30)

month of maximum use, from 2 wells, having a diameter of TBD inches, and a depth of TBD feet
(Estimate) (Estimate)

WITHDRAWAL of SURFACE WATER

Appropriate and use an annual average of ________ gallons per day, and a maximum use
(Total Annual Use / 365)

of ________ gallons in any one day, from

____
(Name of Stream or Waterway)

____
(Exact Location of Intake)

PROJECT LOCATION

1650 Calvert Cliffs Parkway, Lusby, Maryland 20657
(STREET ADDRESS – MAP DIRECTIONS – ADC PAGE/GRID – TAX MAP PAGE/GRID/PARCEL)

County Calvert Subdivision or Town Lusby Phone Number 410-495-4600

Name and Type of Business Generating Plant

SUBDIVISIONS MUST INCLUDE PLAT - ALL PROJECTS MUST INCLUDE LOCATION MAP

PURPOSE

The water will be used for:

- ☐ Community Water Supply
- ☐ Non-Potable Supply (sanitary non Drinking Water)
- ☐ Potable Supply
- ☐ Cooling Water
- ☐ Irrigation
- ☐ Process Water
- ☒ Other, explain See Technical Report Sec. 5.4

WASTEWATER TREATMENT AND DISPOSAL

- ☐ Public Sewer
- ☐ Groundwater
  - ☐ Subsurface (Tilefield, Seepage Pit etc.)
  - ☐ Spray Irrigation
  - ☐ Other, Explain ________
- ☐ Surface Water ________ (Name of stream)

DISCHARGE PERMIT # TBD

SIGNATURE

____

PRINT (NAME) (TITLE) (DATE)

THIS APPLICATION WILL NOT BE PROCESSED WITHOUT A SIGNATURE AND LOCATION MAP

REVIEW BY COUNTY ENVIRONMENTAL HEALTH OR DESIGNATED AGENCY

THIS SECTION NOT TO BE COMPLETED BY APPLICANT

IS PROJECT CONSISTANT WITH THE COUNTY WATER AND SEWER PLAN AND LOCAL PLANNING AND ZONING?

☐ YES ☐ NO, Explain ________

Signature of County Representative ________
(Signature) (Title) (Date)

Response to DNR Data Request No. 13
Calvert Cliffs Case No. 9127
UniStar Nuclear Energy, LLC and UniStar Nuclear Operating Services, LLC
August 20, 2008

Question 13-7

During a meeting between UniStar representatives and the Maryland Power Plant Research Program on August 13, 2008, UniStar indicated that a backup supply of fresh water will be needed to supply water during periods when the desalination plant is not operational. To support the request for a temporary use of ground water for short period, provide the following information:

a. A formal request for the use of ground water as a temporary backup to water obtained from the desalination plant;

b. A description of the types and duration of potential situations that would require the use of ground water as a replacement for the water obtained from the desalination plant; and

c. A description of the size and number of tanks that will be used to store desalinated water prior to use in Unit 3.

RESPONSE

a. The requested "Application to Appropriate and Use Waters of the State" form for *backup ground water for desalination plant* is attached. Annual average daily and daily month of maximum use flow values of 263,520 gpd (183 gpm) and 440,640 gpd (306 gpm), respectively, represent the expected water consumptive rates for normal plant operating conditions and normal shutdown/cooldown identified in Table 2.3-1. An annotated copy of Table 2.3-1 is attached to identify the values used to develop the backup water rates.

b. See the Response to DNR Data Request 13-8 for examples of potential situations that would require the use of ground water as replacement for desalination plant water. Based on current storage tank capacity (see response to (c) below), the plant could only sustain a complete termination of desalination water production for a period of 12 hours (4 hours under shutdown conditions).

c. The current conceptual design incorporates two, 300,000-gallon Desalination Water Storage Tanks.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Water Management Administration - Water Rights Division
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(410) 537-3591 • 1-800-633-6101 • http://www.mde.state.md

APPLICATION TO APPROPRIATE AND USE WATERS OF THE STATE

☒ New Application ☐ Change in Existing Permit Application Number ____________

APPLICATION

Calvert Cliffs 3 Nuclear Project, LLC — 410-470-5857
(Owners Name) (Daytime Phone Number)

750 E. Pratt Street, — Baltimore — Maryland — 21202
(Mailing Address) (Street) (City) (State) (Zip Code)

WITHDRAWAL of GROUNDWATER

Appropriate and use an annual average of

263,520 Gallons per day, and
(Total Annual Use / 365)

440,640 gallons per day during
(Highest Monthly Use / 30)

month of maximum use, from 2 wells, having a diameter of TBD inches, and a depth of TBD feet
(Estimate) (Estimate)

WITHDRAWAL of SURFACE WATER

Appropriate and use an annual average of

____________ gallons per day, and a maximum use
(Total Annual Use / 365)

of ____________ gallons in any one day, from

____
(Name of Stream or Waterway)

____
(Exact Location of Intake)

PROJECT LOCATION

1650 Calvert Cliffs Parkway, Lusby, Maryland 20657
(STREET ADDRESS – MAP DIRECTIONS – ADC PAGE/GRID – TAX MAP PAGE/GRID/PARCEL)

County Calvert Subdivision or Town Lusby Phone Number 410-495-4600

Name and Type of Business Generating Plant

SUBDIVISIONS MUST INCLUDE PLAT - ALL PROJECTS MUST INCLUDE LOCATION MAP

PURPOSE

The water will be used for:

- ☐ Community Water Supply
- ☐ Non-Potable Supply (sanitary non Drinking Water)
- ☐ Potable Supply
- ☐ Cooling Water
- ☐ Irrigation
- ☐ Process Water
- ☒ Other, explain Emergency use - desalination water unavailable

WASTEWATER TREATMENT AND DISPOSAL

- ☐ Public Sewer
- ☐ Groundwater
  - ☐ Subsurface (Tilefield, Seepage Pit etc.)
  - ☐ Spray Irrigation
  - ☐ Other, Explain ____________
- ☐ Surface Water ____________
  (Name of stream)

DISCHARGE PERMIT # TBD

SIGNATURE ____________

PRINT (NAME) (TITLE) (DATE)

THIS APPLICATION WILL NOT BE PROCESSED WITHOUT A SIGNATURE AND LOCATION MAP

REVIEW BY COUNTY ENVIRONMENTAL HEALTH OR DESIGNATED AGENCY

THIS SECTION NOT TO BE COMPLETED BY APPLICANT

IS PROJECT CONSISTANT WITH THE COUNTY WATER AND SEWER PLAN AND LOCAL PLANNING AND ZONING?

☐ YES ☐ NO, Explain ____________

Signature of County Representative ____________
(Signature) (Title) (Date)

Table 2.3-1 Rev. 1 Maximum Anticipated Water Use

Water Streams	Average Flow [a] gpm (lpm)	Maximum Flow [b] gpm (lpm)
Desalinated Water (Fresh Water) Demand [c,d]	**3,063 (11,595)**	**3,063 (11,595)**
Membrane Filtration	306 (1,158)	306 (1,158)
Reverse Osmosis	2,757 (10,437)	2,757 (10,437)
Reverse Osmosis Reject [e]	1,532 (5,799)	1,532 (5,799)
Essential Service Water System (ESWS)/Ultimate Heat (UHS) System Makeup [e,f]	629 (2,381)	1,490 (5,640)
ESWS Cooling Tower Evaporation [l]	566 (2,142)	1,364 (5,163)
ESWS Cooling Tower Drift	2 (8)	4 (16)
ESWS Cooling Tower Blowdown	61 (231)	122 (461)
Power Plant Makeup	183 (693)	926 (3,505)
Demineralized Water Distribution System	80 (303)	80 (303)
Potable and Sanitary Water Distribution System [k]	93 (352)	216 (818)
Plant Users [k]	93 (352)	216 (818)
Non-Plant Users [g]	0 (0)	0 (0)
Fire Water Distribution System [h]	5 (19)	625 (2,365)
Floor Wash Drains	5 (19)	5 (19)
Additional Capacity	413 (1,563)	413 (1,563)
Chesapeake Bay Water Demand	**41,095 (155,563)**	**47,383 (179,365)**
Desalination Plant	3,063 (11,595)	3,063 (11,595)
Circulating Water Supply System (CWS)	38,032 (143,968)	44,320 (167,770)
CWS Cooling Tower Evaporation	19,016 (71,984)	22,160 (83,885)
CWS Cooling Tower Drift [i]	39 (148)	39 (148)
CWS Cooling Tower Blowdown	18,977 (71,836)	22,121 (83,737)
Effluent Discharge to Chesapeake Bay from Seal Well [m]	**21,019 (79,566)**	**24,363 (92,224)**
Seal Well	21,019 (79,566)	24,363 (92,224)
Waste Water Retention Basin Discharge	20,915 (79,172)	24,136 (91,364)
Miscellaneous Low Volume Waste	39 (148)	55 (209)
ESWS Cooling Tower Blowdown	61 (231)	122 (461)
CWS Cooling Tower Blowdown	18,977 (71,836)	22,121 (83,737)
Desalination Plant Waste	1,838 (6,957)	1,838 (6,957)
Membrane Filtration	306 (1,158)	306 (1,158)
Reverse Osmosis Reject [e]	1,532 (5,799)	1,532 (5,799)
Start-up Temporary Storage Discharge [j]	---	---
Trash Screen Cleaning Water Discharge [j]	---	---
Treated Sanitary Waste	93 (352)	216 (818)
Treated Liquid Radwaste	11 (42)	11 (42)

Use 183gpm [263,520GPD]

Use 926-620= 306 gpm [440,640GPD]
620 is the delta between average & max firewater.

Key:
gpm - gallons per minute
lpm - liters per minute

Response to DNR Data Request No. 13
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
August 20, 2008

Question 13-8

In Tab H of the rebuttal testimony of UniStar witness George Vanderheyden, UniStar has requested a change to the State's proposed license conditions 38 and 39. UniStar's proposed change relates to providing available water in excess of the requirement of Calvert Cliffs Unit 3, rather than the wording proposed by the State agencies which was to replace all ground water use at Units 1 and 2. Please provide an explanation of situations when Unit 3 will require additional water from the desalination plant that will prevent a complete replacement of ground water use at Units 1 and 2. To the extent practicable, provide an indication of the frequency and duration of such events.

RESPONSE

Some examples of scenarios when Unit 3 will require additional water from the desalination plant that would prevent a complete replacement of groundwater use at Units 1 and 2 are as follows:

a. Equipment failure allowing contaminants to enter the Condensate/Feedwater system requiring increased make-up to maintain the Condensate/Feedwater system chemistry within acceptable operating parameters.
b. Condenser tube leakage requiring increased make-up to maintain the Condensate/Feedwater system chemistry within acceptable operating parameters.
c. Equipment failures/performance of the Steam Generator Blowdown Recovery System requiring increased blowdown.
d. Contamination of inlet water (Chesapeake Bay) resulting in fouling of more reverse osmosis (RO) cells than designed for with rotating maintenance cells.
e. Multiple failures of desalination plant-related components which result in inability to produce desalinated water for a long period (e.g., greater than 12 hours) from the design basis number of RO cells.

The desalinated water storage capacity of 300,000 gallons per tank, for a total of 600,000 gallons (per Response to DNR Data Request 13-7), is designed to provide make-up for short interruptions in desalination plant operation. The desalinated water storage is not intended to address long-term interruptions in the operation of the desalination plant. It is not possible to postulate the frequency and duration of any one scenario with any degree of confidence; however, any such interruption in desalination plant operation is expected to be relatively rare. Regardless, in any such instance, Calvert Cliffs Unit 3 will require access to sufficient water in order to continue safe plant operations.

Response to DNR Data Request No. 16
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
September 9, 2008

Question 16-1

Please explain why "Scrapers in Travel" (Items #3 and #6 from Table 2-1) are not included in the unpaved road calculations.

RESPONSE

Scrapers in travel are not included in the unpaved road calculations because the emission factor used (in lb/hr) for scrapers, bulldozers, graders and compactors includes all aspects of equipment operation except the lifting and dumping of materials, "batch drops." Emissions from scraper operations, except for dumping of materials, are accounted for in Table B-4. Items 3 and 6 (scrapers in travel) from Table 2-1 are not included as separate items under the unpaved roads emission calculation (Table B-1) because it would be double counting emissions. Items 2, 3, and 4 from Table 2-1 are one "package," i.e., the moving of the dirt, as well as the movement of the equipment itself. The same is true for Items 5, 6, and 7 in Table 2-1. Scraper operating hours are estimated using the engine run hours from Table 8.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Question 16-2

Aggregate handling seems to have multiple transfer points in Table 2-1 (Material Transport to Pile - #27 and Material Transfer – Pile to Silo/Plant - #28). Please explain why these additional transfer points are not accounted for in the batch drop calculations.

RESPONSE

Items 27 and 28 are accounted for in the concrete batching plant calculations in Table B-7 as “aggregate delivery to ground,” “sand delivery to ground,” “aggregate transfer to conveyor,” and “sand transfer to conveyor.” These activities were not calculated using the batch drop equation because the concrete batch section of AP-42 was judged to be more representative of the proposed operations than the general batch drop equation. The batch drop equation was used for barge unloading of sand and aggregates because of the difference in the type of operation.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Question 16-3

Table B-4, line Item #8 Bulldozing is inconsistent with Table 2-1 line Item Number 8. Please explain this discrepancy.

RESPONSE

The hours of bulldozing from Table B-4 were taken from the engine run hours from Table B-8. The engine run hours includes hours from bulldozing involved with vegetation removal (Item 1), site grading (Item 8), excavation (Item 13), and backfilling (Item17). An additional item not included in Table 2-1, but included in Table B-8, is engine run hours for storage pile maintenance at the concrete batch plant. Emissions from bulldozing were calculated using the worst case material (dirt) as noted below.

$$E(lb/hr) = 2.67 * 0.36 * \frac{s^{1.5}}{M^{1.4}}$$

Material	Silt Content	Moisture Content	Emissions (lb/hr)
Dirt	7.5% [1]	3.4% [1]	3.68
Sand	2.6% [1]	4.17% [2]	0.56
Aggregate	< 4.0% [3]	1.77% [2]	3.57

[1] AP-42 Table 13.4.2-1.
[2] AP-42 Table 12.12-2, footnote b.
[3] Engineering judgment.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Question 16-4

Please provide the assumption used to estimate predicted hours of operation for grading in Table B-4. In addition, traditional AP-42 methodology uses vehicle miles traveled (VMT) for calculations. Therefore, please provide the VMT for Item Numbers 2 and 5.

RESPONSE

The assumed number of hours for grading comes from the engine run hours found in Table B-8. These estimates of engine operating hours were developed by the project development contractor. As noted in Section 2.1.3 of ENSR's report, the methodology used for estimating emissions from graders (in addition to bulldozers and scrapers) comes from the Mojave Desert Air Quality Management District (MDAQMD) rather than from AP-42. Note that the MDAQMD methodology is a more current version of the emission factor cited in AP-42 Section 11.9. Moreover, a complicating factor in attempting to use AP-42 methodology for scrapers/graders is the need for information on vehicle speeds. That information was not available from the data received from the contractor.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Response to DNR Data Request No. 16
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
September 9, 2008

Question 16-5

Please provide the basis for the uncontrolled emission factor (lb/ac/dy) from the DAQEM used in Table B-5 (i.e., is an emission factor used for wind erosion in Nevada valid for wind erosion in Maryland?). Otherwise, AP-42 methodology for wind erosion may be more appropriate for estimating emissions.

RESPONSE

The uncontrolled emission factor for wind erosion (1.66 lb/acre/day) came from the original Technical Report prepared by MACTEC and submitted with the Co-Applicants' CPCN Application. The procedure for estimating PM emissions from wind erosion came from the Clark County Department of Air Quality and Environmental Management.

The use of the DAQEM emission factor to estimate wind erosion losses is a conservative emission factor for use in this analysis given the difference in climate between Clark County, Nevada, and the proposed project site in Calvert County, Maryland.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Question 16-6

In Table B-6 for "Sand," should the first line of the table include tons per year for sand, not aggregate? If so, please update relevant tables and text.

RESPONSE

As noted in the Response to DNR Data Request 15-5, the amount of sand is calculated based on the amount of aggregate. The calculation from tons of aggregate to pounds of sand is:

$$tons\ of\ \ aggregate * 2000\frac{lbs}{ton} * \frac{1{,}428\ lbs\ sand}{1{,}865\ lbs\ aggregate}$$

The relationship between aggregate and sand is from AP-42 Table 11.12-2, footnote b. The numbers in Table B-6 are correct as submitted.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Response to DNR Data Request No. 16
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September 9, 2008

Question 16-7

In Table B-6 for "Aggregate," there seems to be a discrepancy between the tons per year (first line) and the lbs per year (second line). Please explain.

RESPONSE

The calculation was to take the tons of aggregate and multiply it by a 1,865/1,428 ratio (overcounting). The comparative emissions (in tons per year) are listed below.

	As Submitted	Corrected	Difference
2010	0.18	0.15	(- 0.03)
2011	0.29	0.24	(- 0.05)
2012	0.18	0.15	(- 0.03)
2013	0	0	0
2014	0	0	0
2015	0	0	0

There is no reason to switch values at this point because the air dispersion modeling performed with the higher value demonstrated compliance with the NAAQS.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Response to DNR Data Request No. 16
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
September 9, 2008

Question 16-8

In Table B-6, please provide the basis for determining "I" – the percentage of time with unobstructed wind speed >12 miles per hour. When using the on-site meteorological data for years 2001 through 2005 for the 10-meter height, wind speed is over 12 mph 5.5% of the time; while at the 60-meter height, wind speed is over 12 mph 39.1% of the time.

RESPONSE

The percentage of time with unobstructed wind greater than 12 miles per hour "I" should have been 5.5%. The 13.3% used in Table B-6 was the default value for "conservative wind hours" from the Mojave Desert Guidance. Using this default value for I instead of the on-site data had the effect of overestimating emissions from storage piles. There is no reason to switch values at this point since the air dispersion modeling performed with the higher value demonstrated compliance with the NAAQS.

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Response to DNR Data Request No. 17
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
September 9, 2008

Question 17-1

In Table 8 from the *Report of the Construction Activities and Air Impacts from the Proposed Unit 3 at Calvert Cliffs Nuclear Power Plant*, dated August 2008, please explain the basis for not including the rated power and load factor in the adjusted emission factor calculations for particulate matter as suggested by the EPA at the 12th International Emission Inventory Conference in 2003 (the same presentation referenced in the spreadsheet notes).

RESPONSE

As noted in the Responses to DNR Data Requests 15-1 and 15-2, the updated version of Table 8 lays out the separate calculation procedure for particulate matter (as well as SO_2), which *does* include rated power and load factor. Note that the non-road engine guidance used as the basis for the emission estimates postdates the 2003 conference noted in the data request.

The calculation of particulate matter is as follows:

PM (lb/yr) = $EF_{adj(PM)}$ * load factor * hours/yr * rated power / 453.6

$EF_{adj(PM)} = EF_{SS} * TAF * DF - S_{PMadj}$
$EF_{adj(PM)}$ is Equation 2 from EPA-420-P-04-009

$S_{PMadj} = BSFC_{adj} * 453.6 * 7.0 * soxcnv * 0.01 * (soxbas – soxdls)$
S_{PMadj} is Equation 5 from EPA-420-P-04-009

Robert Iwanchuk, Certified Consulting Meteorologist with ENSR, and Ian Miller, Air Quality Engineer with ENSR, supplied the information for this answer.

Response to DNR Data Request No. 18
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
October 7, 2008

Question 18-1

In discussions between UniStar representatives and PPRP regarding the wording of recommended CPCN conditions related to water supply, UniStar requested a change to the condition authorizing the use of ground water as backup fresh water supply for operations, in the event that desalination is unavailable. Specifically, the condition (#16 in PPRP's latest draft provided to UniStar) states: "The water shall be used for the demineralized water distribution system, potable and sanitary needs, fire water distribution system and floor wash drains." UniStar requested the addition of the phrase "...and other plant uses." Please identify, specifically, what plant uses this would entail.

RESPONSE

Because the question quotes text from recommended Condition 27, rather than Condition 16, the Co-Applicants' response assumes that Condition 27 is the appropriate reference. The initial evaluation assumed that the Ultimate Heak Sink (UHS) basins associated with each Essential Service Water System (ESWS) cooling tower could be drawn down in lieu of utilizing groundwater and, as such, the total makeup to the ESWS cooling towers (629 gpm/905,760 gpd, per Table 2.3-1) would not be required. However, NRC regulations require a minimum amount of water dedicated for Design Basis Accident use. As such, to support continued plant operation in the event that the desalination plant is not available, the ESWS/UHS makeup must also be supplied from the groundwater.

Response to DNR Data Request No. 19
Maryland Public Service Commission Case No. 9127
Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
October 8, 2008

Question 19-1

During a meeting between UniStar representatives and the Maryland Power Plant Research Program on August 13, 2008, UniStar indicated that a backup supply of fresh water will be needed to supply water during periods when the desalination plant is not operational. DNR submitted Data Request No. 13-7 to UniStar to solicit detailed information regarding the basis for the request. In response to DNR Data Request No. 13-7, UniStar indicated that an annual average daily and daily month of maximum use flow values of 263,520 and 440,640 gallons per day of backup ground water would be needed. The response to DNR Data Request No. 13-7 indicated that the requested amounts represent expected water consumptive rates for normal plant operations and normal shutdown/cooldown indentified in Table 2.3-1 Rev.1.

PPRP understands that UniStar is now requesting 1,250,000 gallons per day for a period up to 30 days to ensure a backup supply of makeup water to the Essential Service Water System. To support the request for a temporary use of ground water, provide the following information:

a. Revised formal request for the use of ground water as a temporary backup supply;

b. Description of the basis for the amount requested (using Table 2.3-1 Revision 1 as a guide) and a list of operations to be supplied by the requested amount;

c. Explanation as to why a 30-day period would be necessary to complete repairs to the desalination plant; and

d. Description of the potential consequences of not using ground water as a backup supply, and other options available to UniStar in the event of a complete shutdown of the desalination plant.

RESPONSE*

a. Attached is the requested "Application to Appropriate and Use Waters of the State" for backup groundwater in the unlikely event the desalination plant is unavailable.

b. As identified in Table 2.3-1, Rev. 1, Essential Service Water System/Ultimate Heat Sink Makeup and Power Plant Makeup are 629 gpm (905,760 gpd) and 183 gpm (263,520 gpd), respectively. The sum of these two flows results in the balance of water required for plant operation of 812 gpm (1,169,280 gpd). Allowing 5% for contingency results in 853 gpm (1,227,744 gpd), which rounded leads to 1,250,000 gpd. An annotated copy of Table 2.3-1, Rev 1 is attached to identify the values used to develop the backup water rates.

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* This response supersedes the Co-Applicants' Response to DNR Data Request No. 13-7.

c. Up to 15 days of backup groundwater is contemplated to support unscheduled service outages, which would include Water Treatment Facility (WTF) equipment as well as individual trains within the desalination plant affected by either extreme weather (e.g., hurricanes, severe electrical storms) and/or upset inlet water conditions vastly exceeding the WTF design parameters. Whole or partial shutdown of the desalination system resulting from failure or multiple failures of primary equipment or the pre-emptive isolation/shutdown of the desalination system (to preclude damage/failure) would require backup groundwater to maintain operation. Recovery from an extreme fouling scenario may require the removal of all process elements (Pre-Treatment: Micro Filtration- Modules, Ultra Filtration- Filters; Post Treatment: RO-Membranes), multiple staged sanitizing and cleaning of Biocide, High/Low pH, flushing and sampling tests of the water, loading all replacement elements into the equipment, system flushing and start-up, and commissioning activities. Recovery from multiple failures of primary equipment such as electrical, programming and instrumentation and control equipment would require replacement (removal, ordering, reinstallation, programming, commissioning and testing/checkout) of not only the major failed component but ancillary adjacent components as well. Based on experience it is reasonable to assume that any of the above scenarios could take up to 15 or more days to resolve and have the desalination plant back to design capacity.

d. Without groundwater there is no backup supply of water available to sustain operation of the power plant. As identified in the Co-Applicants' Response to DNR Data Request No. 13-7, the two 300,000-gallon Desalination Water Storage Tanks currently contemplated in the conceptual design can accommodate less than 12 hours of the required water demand. As such, in accordance with licensing requirements, without groundwater backup and in the event of complete loss of desalination plant production, shutdown of the unit would be initiated.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Water Management Administration - Water Rights Division
1800 Washington Blvd. • Baltimore, Maryland 21230
(410) 537-3591 • 1-800-633-6101 • http://www.mde.state.md

APPLICATION TO APPROPRIATE AND USE WATERS OF THE STATE

[x] New Application   [ ] Change in Existing Permit   Application Number ________

APPLICATION

Calvert Cliffs 3 Nuclear Project, LLC — 410-470-5857
(Owners Name) (Daytime Phone Number)

750 E. Pratt Street, — Baltimore — Maryland — 21202
(Mailing Address) (Street) (City) (State) (Zip Code)

WITHDRAWAL of GROUNDWATER *

Appropriate and use an annual average of

________ Gallons per day, and
(Total Annual Use / 365)

________ gallons per day during
(Highest Monthly Use / 30)

month of maximum use, from 2 wells, having a diameter of TBD inches, and a depth of TBD feet
(Estimate) (Estimate)

WITHDRAWAL of SURFACE WATER

Appropriate and use an annual average of

________ gallons per day, and a maximum use
(Total Annual Use / 365)

of ________ gallons in any one day, from

____
(Name of Stream or Waterway)

____
(Exact Location of Intake)

PROJECT LOCATION

1650 Calvert Cliffs Parkway, Lusby, Maryland 20657
(STREET ADDRESS – MAP DIRECTIONS – ADC PAGE/GRID – TAX MAP PAGE/GRID/PARCEL)

County Calvert Subdivision or Town Lusby Phone Number 410-495-4600

Name and Type of Business Generating Plant

SUBDIVISIONS MUST INCLUDE PLAT - ALL PROJECTS MUST INCLUDE LOCATION MAP

PURPOSE

The water will be used for:

- [ ] Community Water Supply
- [ ] Non-Potable Supply (sanitary non Drinking Water)
- [ ] Potable Supply
- [ ] Cooling Water
- [ ] Irrigation
- [ ] Process Water
- [x] Other, explain Emergency use - desalination water unavailable

WASTEWATER TREATMENT AND DISPOSAL

- [ ] Public Sewer
- [ ] Groundwater
  - [ ] Subsurface (Tilefield, Seepage Pit etc.)
  - [ ] Spray Irrigation
  - [ ] Other, Explain ________
- [ ] Surface Water ________
  (Name of stream)

DISCHARGE PERMIT # TBD

SIGNATURE ________

PRINT (NAME) (TITLE) (DATE)

THIS APPLICATION WILL NOT BE PROCESSED WITHOUT A SIGNATURE AND LOCATION MAP

REVIEW BY COUNTY ENVIRONMENTAL HEALTH OR DESIGNATED AGENCY

THIS SECTION NOT TO BE COMPLETED BY APPLICANT

IS PROJECT CONSISTANT WITH THE COUNTY WATER AND SEWER PLAN AND LOCAL PLANNING AND ZONING?

[ ] YES [ ] NO, Explain ________

Signature of County Representative ________
(Signature) (Title) (Date)

* The requested authorization would allow for the appropriation and use of ground waters of the State from the Aquia aquifer to continue plant operations in the event that the desalination plant becomes inoperable and is unable to supply Calvert Cliffs Unit 3. The ground water withdrawal granted by this appropriation is limited to a maximum of 1,250,000 gallons per day for a period of up to 15 days. The water is to be used to continue plant operations, including for the demineralized water distribution system, potable and sanitary needs, fire water distribution system, floor wash drains, Essential Service Water System makeup, and other plant uses. The water will be withdrawn from the two production wells completed in the Aquia aquifer, with the point of withdrawal located at the construction site of Calvert Cliffs Unit 3.

Table 2.3-1 Rev. 1 Maximum Anticipated Water Use

Water Streams	Average Flow [a] gpm (lpm)	Maximum Flow [b] gpm (lpm)
Desalinated Water (Fresh Water) Demand [c,d]	**3,063 (11,595)**	**3,063 (11,595)**
Membrane Filtration	306 (1,158)	306 (1,158)
Reverse Osmosis	2,757 (10,437)	2,757 (10,437)
Reverse Osmosis Reject [e]	1,532 (5,799)	1,532 (5,799)
Essential Service Water System (ESWS)/Ultimate Heat (UHS) System Makeup [e,f]	629 (2,381)	1,490 (5,640)
ESWS Cooling Tower Evaporation [l]	566 (2,142)	1,364 (5,163)
ESWS Cooling Tower Drift	2 (8)	4 (16)
ESWS Cooling Tower Blowdown	61 (231)	122 (461)
Power Plant Makeup	183 (693)	926 (3,505)
Demineralized Water Distribution System	80 (303)	80 (303)
Potable and Sanitary Water Distribution System [k]	93 (352)	216 (818)
Plant Users [k]	93 (352)	216 (818)
Non-Plant Users [g]	0 (0)	0 (0)
Fire Water Distribution System [h]	5 (19)	625 (2,365)
Floor Wash Drains	5 (19)	5 (19)
Additional Capacity	413 (1,563)	413 (1,563)
Chesapeake Bay Water Demand	**41,095 (155,563)**	**47,383 (179,365)**
Desalination Plant	3,063 (11,595)	3,063 (11,595)
Circulating Water Supply System (CWS)	38,032 (143,968)	44,320 (167,770)
CWS Cooling Tower Evaporation	19,016 (71,984)	22,160 (83,885)
CWS Cooling Tower Drift [i]	39 (148)	39 (148)
CWS Cooling Tower Blowdown	18,977 (71,836)	22,121 (83,737)
Effluent Discharge to Chesapeake Bay from Seal Well [m]	**21,019 (79,566)**	**24,363 (92,224)**
Seal Well	21,019 (79,566)	24,363 (92,224)
Waste Water Retention Basin Discharge	20,915 (79,172)	24,136 (91,364)
Miscellaneous Low Volume Waste	39 (148)	55 (209)
ESWS Cooling Tower Blowdown	61 (231)	122 (461)
CWS Cooling Tower Blowdown	18,977 (71,836)	22,121 (83,737)
Desalination Plant Waste	1,838 (6,957)	1,838 (6,957)
Membrane Filtration	306 (1,158)	306 (1,158)
Reverse Osmosis Reject [e]	1,532 (5,799)	1,532 (5,799)
Start-up Temporary Storage Discharge [j]	---	---
Trash Screen Cleaning Water Discharge [j]	---	---
Treated Sanitary Waste	93 (352)	216 (818)
Treated Liquid Radwaste	11 (42)	11 (42)

Key:
gpm - gallons per minute
lpm - liters per minute

Use 629+183 = 812 gpm [1,169,280GPD]

Add 5% margin & round = 1,250,000 GPD