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Dominion®

April 8, 2011

Ms. Sarah Marsala
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, Virginia 21193

RE: Dominion North Anna Power Station Unit 3
Part III-Major Surface Water Withdrawal for Operational Activities and Lake Level Rise
Joint Permit Application No. 10-2001
Addendum 1, Response to Additional Information Request

Dear Ms. Marsala:

Enclosed is Dominion's Addendum 1 to the application submitted for a major surface water withdrawal and associated lake level rise for the operation of the proposed North Anna Power Station Unit 3. Addendum 1 provides additional information associated with three separate requests from DEQ:

1. A February 9, 2011 letter
2. A February 15, 2011 email
3. A February 25, 2011 email

A permit application fee of $25,000 was sent to DEQ Receipts Control today under separate cover. A copy of the letter, application fee form and check are enclosed.

If you have any questions, please contact Jason Ericson at (804) 273-3485.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Attachments

Cc: Mr. Randy Owen, VMRC
Ms. Carolyn Cannella, USACE

JPA No. 10-2001 Part III Operational Water Withdrawal Addendum #1

DEQ Additional Information Request Letter; February 9, 2011

DEQ Question 1: Provide more detail as to how the withdrawal demand for each proposed withdrawal system was determined. In your discussion, provide the water budget upon which the proposed withdrawal volumes are based, including a diagram of each proposed withdrawal system depicting both inputs and outputs.

Dominion Response:
Figures 1 and 2 depict the general flow of water for the operation of Unit 3. Below is additional information regarding the estimated water withdrawal values presented in the December 2010 Joint Permit Application for Major Water Withdrawal and Lake Level Rise (JPA). The responses are provided for each system reliant on makeup water from Lake Anna; Circulating Water System (CWS) and Ultimate Heat Sink (UHS), Station Water System (STW) and Fire Protection Water Supply System (FSS); for the average daily withdrawal rate, maximum daily withdrawal rate and maximum instantaneous withdrawal rate.

- Average Daily Withdrawal Rate
    - CWS and UHS: The average daily withdrawal calculation is based on the Lake Anna Water Budget Model (the Model). The Model simulates Unit 3 operation using approximately 29 years of historical data and incorporates the Energy Conservation (EC) and Maximum Water Conservation (MWC) modes dictated by Lake Anna water level as described in the JPA. Additionally the average daily withdrawal considers Unit 3 operation at a 96% capacity factor. These bases provide a realistic approximation of the average withdrawal over time. The withdrawal calculation for each timestep can be summarized into three steps:
        - Dominion obtained performance data plots of evaporation versus temperature for a range of relative humidity values from a cooling tower vendor for the Unit 3 plant cooling design. Using this information, an evaporation rate of the CWS and UHS cooling towers for each time step was determined based on the operating mode, daily average temperature and daily average relative humidity. In EC mode the dry cooling towers are turned off and the entirety of the heat load is handled by the hybrid (wet) tower. In MWC mode, a minimum of 1/3rd of the heat duty is handled by dry cooling, which does not consume water. The consumptive use for any day is the calculated evaporation rate plus wet tower drift losses which was assumed to be 8 gallons per minute (gpm) or 11,520 gallons per day (gpd).
        - The discharge, or blowdown, from the CWS/UHS system is calculated using the evaporation rate discussed above and the cooling systems operating at four cycles of concentration (COC) where:
            - Blowdown = Evaporation/ (COC-1) – Drift.

- A COC of four is conservative since the plant could potentially run at higher COCs while still maintaining acceptable cooling system water chemistry. Operating at higher COCs would reduce the amount of blowdown thereby reducing the required amount of water withdrawal from Lake Anna.
- The actual withdrawal from Lake Anna for a time step was calculated as the sum of the blowdown, drift and evaporation.

  - STW: The primary function of the STW is to supply makeup water to the demineralized water treatment system. The expected average withdrawal for STW of 0.12 million gallons per day (84 gpm) was estimated as the daily average flow rate considering plant demineralized water use during plant normal, full power operation.
  - FSS: With the exception of a fire event, the FSS only withdrawals water from Lake Anna during periodic system flushes and flow tests. The normal FSS withdrawal is based on four regular flow tests; hydrants, fire pumps, sprinkler system main drains and sprinkler flow alarms; for an estimated annual withdrawal of 153,200 gallons per year (gpy). This results in an average of 420 gpd. For the purposes of providing a conservative estimate of a daily average, the value was rounded up to 1 gpm or 1,440 gpd.

- Maximum Daily Withdrawal Rate
  - CWS and UHS: The maximum daily withdrawal calculation is based on Unit 3 operating at a 100% capacity factor in EC mode. The evaporation, blowdown and withdrawal rates were calculated as described above. The maximum withdrawal corresponds to the maximum evaporation rate for any day obtained from the relative humidity and temperature data over the 29 year model period.
  - STW: Maximum daily withdrawal for STW is the withdrawal rate required to provide the amount of makeup water necessary for demineralized water production to support the maximum expected daily plant demineralized water demand. This value was calculated by the design engineer based on maximum blowdown from the system plus the volume of makeup water required during normal operation of the demineralized water treatment system.
  - FSS: FSS withdrawal is only expected to occur during the periodic testing discussed above. Fire events are abnormal occurrences and are not considered in the expected withdrawals. Therefore, the maximum daily flow is assumed to be the same as the average daily flow.
- Maximum Instantaneous Withdrawal Rate: The environmental and operational conditions that drive the maximum instantaneous withdrawal would only exist for a portion of an operating day.
  - CWS and UHS: The maximum instantaneous withdrawal for the CWS and UHS is assumed to be the limit included in the Nuclear Regulatory Commission's (NRC) Early Site Permit (ESP) Environmental Report (ER) (22,268 gpm). This is the expected rate of withdrawal when the plant is operating during extreme ambient conditions and would only occur for a portion of an operating day.
  - STW: The maximum instantaneous withdrawal for the STW is assumed to be the limit included in the ESP ER (720 gpm).

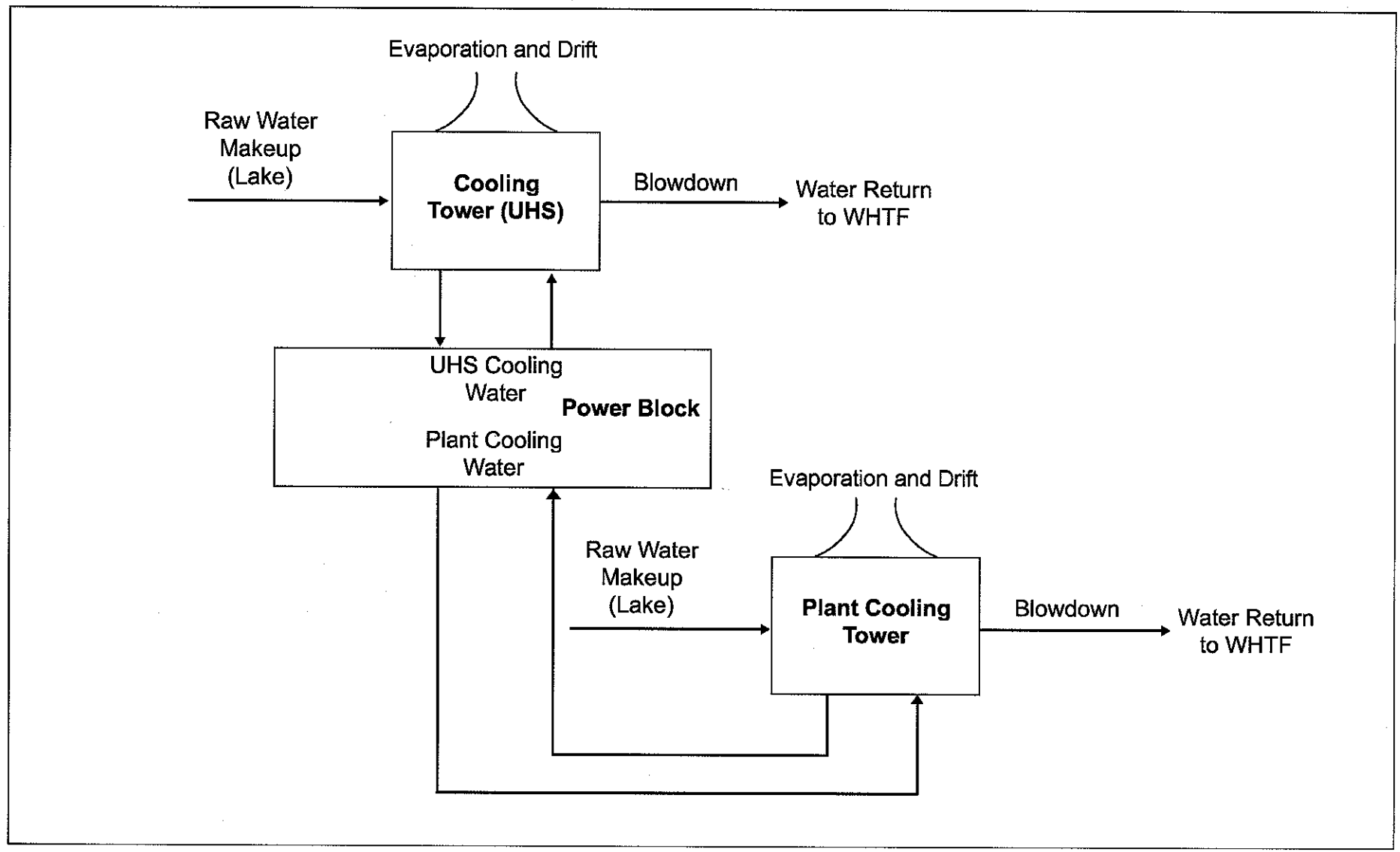

Evaporation and Drift
Raw Water
Makeup
(Lake)
Cooling
Tower (UHS)
Blowdown
Water Return
to WHTF
UHS Cooling
Water
Power Block
Plant Cooling
Water
Evaporation and Drift
Raw Water
Makeup
(Lake)
Plant Cooling
Tower
Blowdown
Water Return
to WHTF

Figure 1

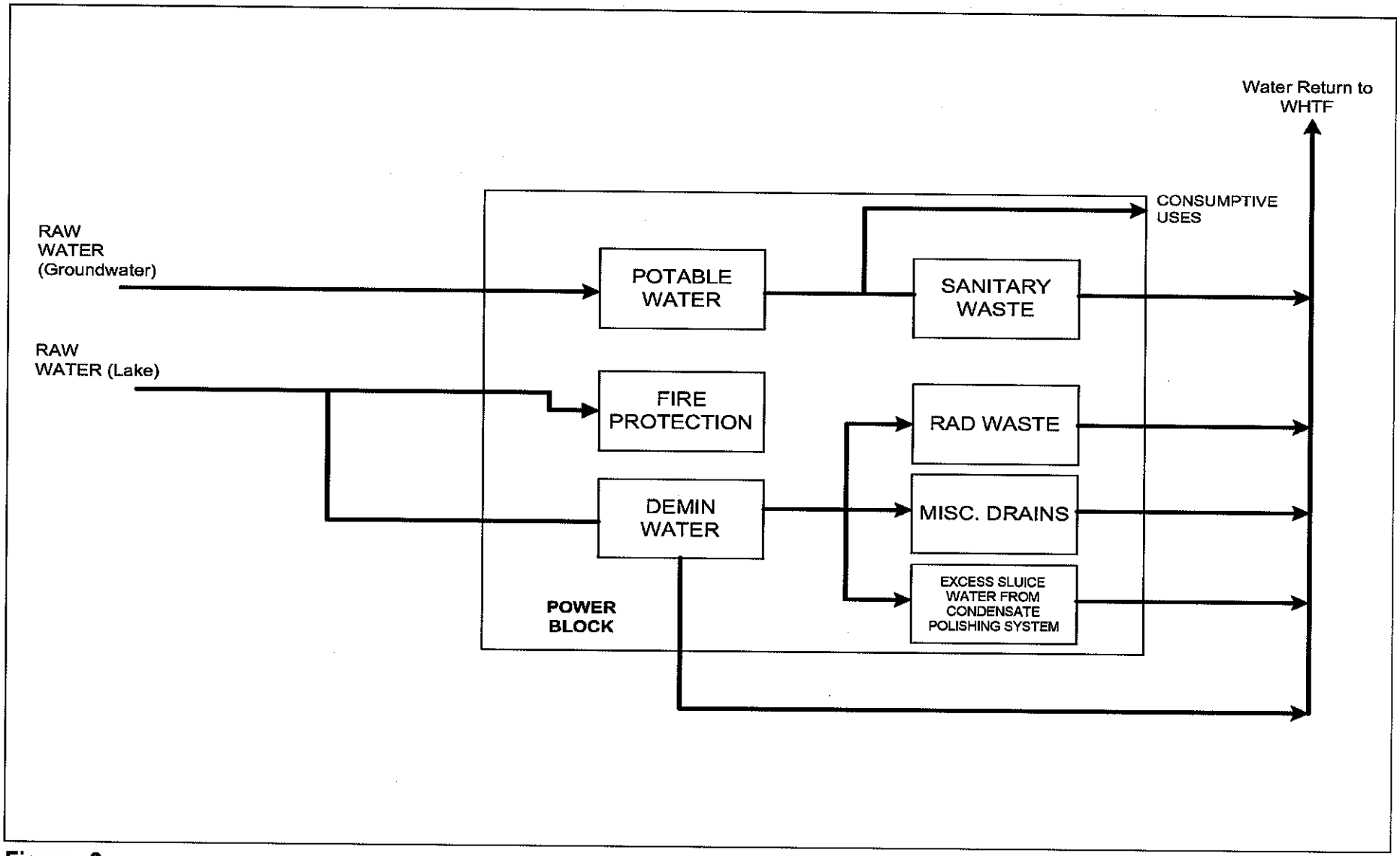

Water Return to WHTF
CONSUMPTIVE USES
RAW WATER (Groundwater)
RAW WATER (Lake)
POTABLE WATER
FIRE PROTECTION
DEMIN WATER
SANITARY WASTE
RAD WASTE
MISC. DRAINS
EXCESS SLUICE WATER FROM CONDENSATE POLISHING SYSTEM
POWER BLOCK

Figure 2

- FSS: The maximum instantaneous withdrawal for the FSS would occur during a fire event. The rate assumed is the rated capacity of the FSS pumps (2,500 gpm).

DEQ Question 2: Discuss the proposed frequency of occurrence/withdrawal for each of the withdrawal systems.

Dominion Response:
The frequency of withdrawal is based on operating and environmental conditions. If the Cooling Towers are in the EC Mode and it is warm outside, there will most likely be constant Cooling Tower makeup. However, if the system is in MWC Mode and it is cold outside there may be only intermittent water withdrawal. The same can be said about STW usage. There are occasions when it may not be necessary to run the demineralized water system (DWT) every day. However, if the station is experiencing mechanical or chemistry problems, the DWT may be required to operate at some specific output flow continually. A typical situation where the DWT would run continually would be at the end of a refueling outage where large quantities of water would be needed to fill and flush systems that were drained during the outage. The fire protection equipment will only need lake water during periodic testing unless there is a fire.

DEQ Question 3: Discuss when the proposed maximum withdrawal volumes are anticipated to occur for each withdrawal system.

Dominion Response:
- CWS and UHS: The maximum CWS consumptive use and associated withdrawals would occur when the unit is operating in EC mode at extreme ambient conditions (i.e., high temperatures and relative humidity). The maximum UHS consumptive use during normal plant operation would also occur during extreme ambient conditions. The overall maximum UHS consumptive use and withdrawal would occur during plant shutdown (e.g. for refueling) or an accidental condition when UHS heat loads are highest; in which case the CWS would be shut down or in the process of shutting down. In this case, there is no evaporative loss from the CWS cooling towers.
- STW: The STW withdrawal is anticipated to remain fairly consistent throughout operations. However, the maximum withdrawal would likely occur during peak plant demineralized water demand resulting from plant transients, such as plant start up or shut down, or batch operations.
- FSS: The maximum FSS withdrawal would occur during an emergency event (i.e. fire).

DEQ Question 4: The total maximum monthly and annual volumes for all the proposed withdrawal systems is 30.2 million gallons per day (MGD) and 26.0 MGD, respectively (Section 27 of the JPA for Water Withdrawal Use, Need and Alternatives). However, the maximum daily and average daily volumes are 31.8 MGD and 18.7 MGD, respectively (Section 27 of the JPA and Tables 1 and 2 of the application).

a. Clarify why the total maximum monthly and maximum annual volumes are less than the total maximum daily and daily averages.

b. Provide the total maximum monthly and annual volumes in million gallons.

Dominion Response (a):
For consistency, Dominion presented all withdrawal values in Section 27 of the JPA in mgd and gpm. The maximum monthly withdrawal rate expressed in mgd is less than the maximum daily withdrawal rate in mgd because that value represents the maximum daily average withdrawal during a 30 day running period over the approximately 29 year modeling period. The maximum daily withdrawal is the largest one day withdrawal over the 29 year modeling period. The same reasoning explains why the maximum annual withdrawal expressed in mgd is less than the maximum daily withdrawal expressed in mgd. The maximum monthly and annual withdrawals were estimated using the sum of three components;

- The maximum monthly rate of withdrawal for the CWS/UHS was estimated based on maximum evaporation rate from the CWS and UHS cooling towers for any 30 day running period over the approximately 29 year modeling period at 100% station capacity. The maximum annual rate of withdrawal for the CWS/UHS was estimated based on maximum evaporation rate from the CWS and UHS cooling towers for any 365 day running period over the approximately 29 year modeling period at 100% station capacity.
- The maximum daily rate of withdrawal for STW as defined in response to DEQ Question #1 above.
- The maximum daily rate of withdrawal for the FSS as defined in response to DEQ Question #1 above.

Dominion Response (b):
Based on this estimation the total maximum monthly withdrawal is 30.2 mgd which corresponds to approximately 936 million gallons in a 31 day month. Based on this estimation the maximum annual withdrawal is 26.0 mgd which corresponds to approximately 9,490 million gallons in a 365 day year.

DEQ Question 5: Provide a projection of how the proposed withdrawal will alter lake elevations and flows released from the dam over a minimum of a 15 year time period. Provide the data in daily and/or weekly time steps.

Dominion Response:
In addition to the modeling results of lake elevations and flows released from the Lake Anna Dam requested in this question, DEQ staff requested additional data during a March 15, 2011 conference call. An email transmitting the following requested time series from the Lake Anna Water Budget Model was sent to DEQ staff on March 29, 2011:

- Lake Elevations;
- Releases from the Lake Anna Dam;
- Mode of Operation of Unit 3;
- Calculated flow into Lake Anna and the WHTF;
- Evaporation from the surface of Lake Anna and the WHTF; and
- Evaporation from the Unit 3 cooling towers.

DEQ Question 6: Provide on a map indicating the location of the return flow (i.e. discharge) of the non-consumptive volume.

Dominion Response:
Attached (Figure 3) is a copy of the Site Utilization Plan, Figure 1.1-1, from the Combined License Application (COLA) ER, Revision 3. The figure illustrates the proposed Unit 3 infrastructure, including the proposed Unit 3 discharge location, as well as existing Unit 1 & 2 infrastructure.

DEQ Question 7: Discuss the difference between the Circulating Water System (CWS) and the Ultimate Heat Sink (UHS) Cooling Tower Makeup Water System.

Dominion Response: The CWS and the UHS are the two major heat rejection systems for the power station. The larger of the two is the CWS, which provides cooling water to the station's main condenser to condense the steam leaving the turbines, as well as heat generated by components in the Turbine Building. The CWS is cooled by the Hybrid Cooling System. The Hybrid Cooling System is made up of the Dry Cooling Tower and the Hybrid Cooling Tower. The UHS cools heat loads generated by components in the Reactor Building. This system removes the heat that is present in the reactor core after the reactor has been shut down. The heat loads are much smaller than those of the CWS and the cooling towers are also smaller and use much less water. Additional detail is provided in the Response to DEQ Question 8 below.

DEQ Question 8: Discuss in further detail the UHS system. The application explains on page 9 that the water for this system is pumped into a storage basin below each cooling tower that holds a 30 day make-up water supply. How is this withdrawal system proposed to work? Where are the storage basins and cooling towers for this system located?

Dominion Response:
The UHS has four 50% capacity cooling towers located south-south west (also shown as "Plant North" on Figure 3) of the center of the Reactor Building. The major cooling loads for the system are the spent fuel pool and the residual heat in the reactor core following shutdown of the reactor. The system must be capable of removing this heat load, assuming a loss of all makeup capability, for 30 days following a postulated accident. For this reason, the water stored in the basin of each cooling tower is a minimum of one third of the capacity to ensure cooling for 30 days. Transfer pumps are used to move water between basins, if one of the cooling towers stops functioning. Only two cooling towers are required to perform the emergency function.

The withdrawal of cooling water for the system is performed by the Makeup and Blowdown System (MBS), which serves both the UHS and CWS Systems. Three 50% capacity pumps are located in the Station Water Intake and supply water to the CWS Hybrid Cooling Tower and UHS Cooling Tower basins. One or two pumps operate to maintain the proper levels in the basins and one pump is in standby. The quantity of makeup water required for the UHS towers is much smaller than that required for the CWS.

Figure 1.1-1 Site Utilization Plan

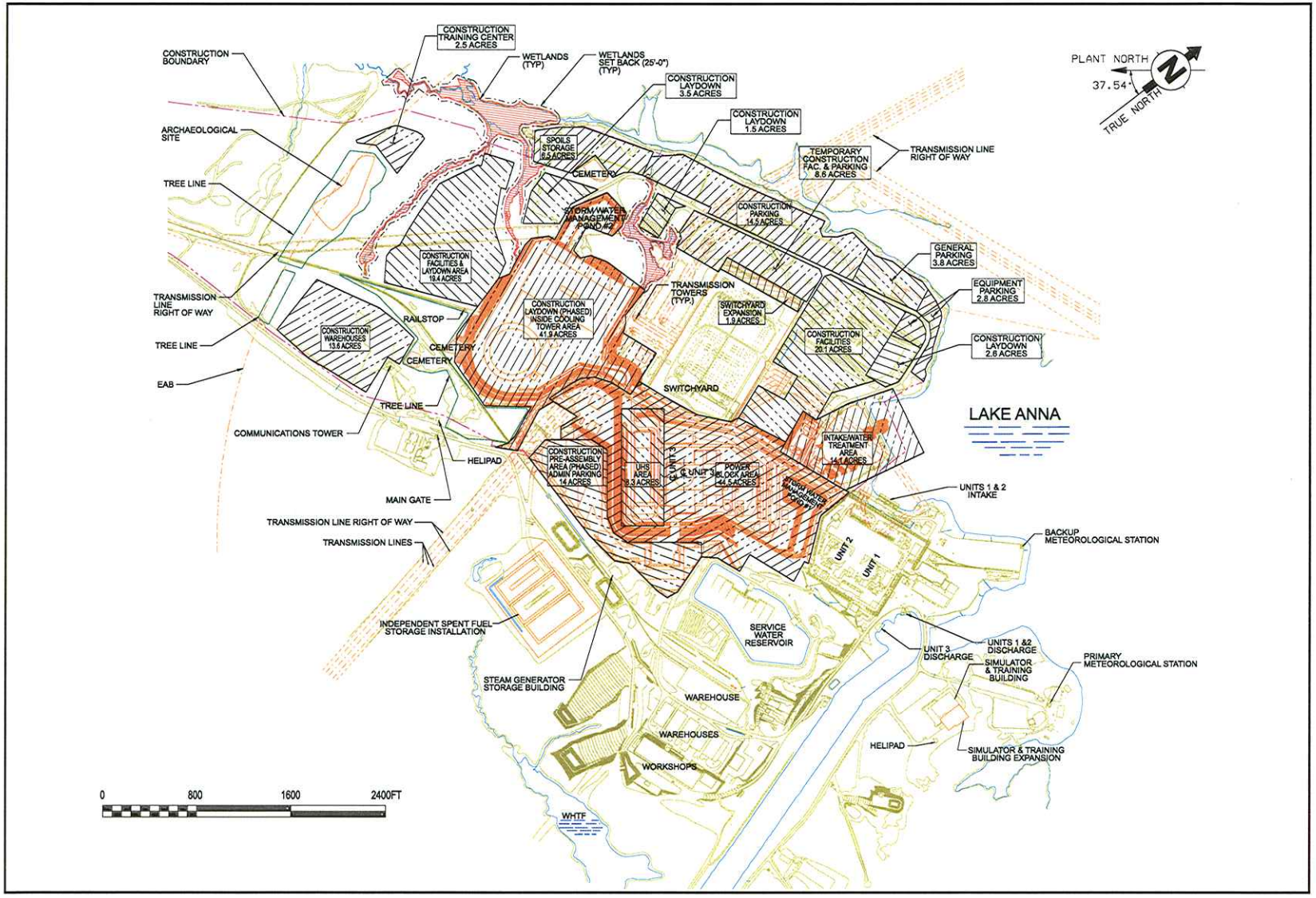


Figure 3: Site Utilization Plan

DEQ Question 9: The proposed withdrawal volume for the Station Water System (STW) is described on page 4 of the JPA as being for demineralized water production and miscellaneous uses. Further explain these proposed uses.

Dominion Response: The design for the Station Water System (STW) has two 700 gpm pumps supplying Lake Anna water to a 500,000 gallon storage tank. Only one pump would be operated periodically in order to maintain tank level. The demineralized water treatment system (DWT) would draw water from this tank for use in Unit 3 systems requiring demineralized water. The detailed design of Unit 3 is not complete. The possibility exists that water from the STW tank could be used to supply minor water needs that do not require demineralized water such as equipment cleaning. Any use other than deliveries to the DWT would be minor and the overall withdrawal to the STW tank would remain within the estimated limits described in the response to DEQ Question 1 above. Any water uses of STW are non-consumptive.

DEQ Response 10: Tables 1 and 2 of the JPA (pages 5 and 6) mention that there is no consumptive water use associated with the STW system as there are no evaporators at Unit 3. Is this water considered once-through? Explain what is meant by there being no evaporators at Unit 3.

Dominion Response:
The Station Water System (STW) has one primary demand for water, the Demineralized Water Treatment System (DWT). The DWT system treats the station water (by filtration, ultra-filtration, reverse osmosis and demineralization) to produce demineralized water. Demineralized water is used at NA3 for (partial list):

- Emergency Feedwater System; (supplies cooling water to the Steam Generators during an emergency when normal feedwater is unavailable);
- Condensate Storage and Transfer System; (normal source of cooling water makeup for the condensate and normal feedwater systems);
- Primary makeup water system; (normal source of cooling water makeup for the primary system);
- Chemical Injection System;(normal source of water for mixing and injecting chemicals);
- Condensate Polishing System; (source of flush water for secondary resin);
- CVS system; (source of flush water for primary resin and blended primary makeup);
- Surge tanks; (source of makeup water);
- Containment washdown; (source of water for containment cleanup activities);
- Chilled water system; (source of makeup water);
- LMS system; (source of water for the liquid waste management system);
- PSS system; (source of water for the process and accident sampling system).

These systems do not consume the demineralized water; therefore any demineralized water supplied to these systems will eventually be returned to Lake Anna (with the exception of an occasional small steam leak prior to repair). The demineralized water is not typically considered once-through water since this water is not used as once through cooling but rather for as make-up water for sampling, maintenance activities and other periodic operational activities.

An alternate process used by many Utilities is the use of evaporators. For example, Dominion will use demineralized water in the primary system (heated by the reactor) to transfer heat to the secondary system to turn the turbines. When the primary system is heated up after outage, excess water must be sent to the Liquid Waste System for processing prior to discharging the wastewater. Since this water has boron in solution the boron must be removed prior to discharge. One method of boron removal (and reuse) would be to send the water to an evaporator which evaporates the water and saves the boron. The evaporated water is lost to the environment. The North Anna 3 design has this water sent to demineralizers where the boron and other impurities are removed and discarded. The water is then collected and returned to Lake Anna.

DEQ Question 11: How many Fire Protection Water Supply System Pumps are proposed?

Dominion Response:
The fire protection water supply system (FSS) will consist of three pumps: an electric fire pump; a diesel fire pump; and pressure maintenance pump ("jockey pump"). Only one pump operates at any time. The electric and diesel fire pumps are rated to 2,500 gpm. The electric pump is the primary FSS pump and the diesel pump is a backup. The jockey pump is rated to provide 25 gpm and is activated to maintain system pressure.

DEQ Question 12: How does Dominion propose to demonstrate compliance with consumptive use volume limits?

Dominion Response:
Dominion's estimates of maximum and average consumptive use presented in the JPA are based on, and are bounded by, operational limits as they apply to implementation of the proposed cooling technology within the Lake Anna physiographic area. Dominion will operate the Unit 3 cooling towers in a manner consistent with manufacturer specifications, and will implement MWC and EC modes as required by lake level conditions. The amount of discharge from the operation of Unit 3 will be directly related to the withdrawal volume and mode of operation. Compliance with our water withdrawal limits and mode of operation requirements should be sufficient to demonstrate that consumptive use is consistent with that represented in our application. Strict comparison of withdrawal and discharge on a short term basis would be problematic due to the fact that the cooling system is a closed system and discharge will not always occur at the same time as the associated withdrawal.

DEQ Question 13: How does Dominion propose to monitor the withdrawal volume from the intake structure of Unit 3?

Dominion Response:
Dominion proposes to use a flow totalizer technology that is appropriate for the specific flow stream. These options could include delta-pressure flow instrumentation with a totalizer based

on rate and time (integrated totalizer). Other flow measurement options include paddlewheel flow instruments or vortex shedding devices. The exact type of flow instrument and totalizer will be determined during the detail design phase.

DEQ Question 14: How was the proposal of an increase of three inches determined to be sufficient to mitigate the proposed consumptive withdrawal and existing downstream users? Discuss any other water levels reviewed and any variations in the implementation (seasonal or incremental) of the three inches.

Dominion Response:
The Instream Flow Incremental Methodology (IFIM) Study Plan and the actual study were developed in coordination with Virginia resource agency staff including the Department of Environmental Quality, Department of Conservation and Recreation and the Department of Game and Inland Fisheries. Staff of the resource agencies agreed that a 3-inch rise in lake level was acceptable mitigation to offset an increase in the frequency of low flow releases (20 cfs) from the operation of proposed Unit 3 under drought conditions. More specifically, it was determined that a 3-inch rise in the targeted lake elevation would reduce the frequency at which dam flow releases are at 20 cfs to within 1 percent of the frequency that occurs under existing conditions (4.6 vs 5.5 percent). The Virginia resource agencies concurred with the results and recommendations of the IFIM study.

Dominion estimated that a lake level increase of approximately 7 inches would be required to completely erase an increase in 20 cfs flow releases resulting from operation of Unit 3. However, a number of concerns regarding a 7 inch rise in lake level were identified including the following:

- Dominion received concerns from stakeholders regarding the potential impacts of a lake level rise of 7-inches on the shoreline, as well as existing boat dock and ramp structures,
- The shoreline wetland impacts associated with a lake level rise of 7 inches would be larger than the wetland impacts associated with a 3-inch rise, and

In light of these concerns a 3-inch increase was chosen in order to offset the consumptive use of water while minimizing any potential impacts to the lake shoreline.

DEQ Question 15: How does Dominion propose to monitor the three inch rise in water level to demonstrate compliance with the implementation of the lake level rise?

Dominion Response:
Dominion plans to continue to monitor lake level at the Lake Anna Dam and to comply with conditions tied to the lake level measured at the dam. The technology used to monitor lake level following initiation of operation of Unit 3 has not been selected. Design of Unit 3 and associated systems is currently underway and procedures will be developed prior to raising the target water level.

Based on previous discussions with DEQ staff, Dominion is supportive of the inclusion of the existing Virginia Pollutant Discharge Elimination System (VPDES) Lake Level Contingency Plan and conditions agreed to through the IFIM process in the VWP permit. The inclusion of these conditions would ensure that the resource is managed in a manner to support operations at the North Anna Power Station while maintaining other beneficial uses of Lake Anna and North Anna River.

DEQ Question 16: How does Dominion propose to measure lake level to determine compliance with conditions reliant upon lake level?

Dominion Response:
See response to DEQ Question 15.

Questions 17: How are releases from the North Anna Dam currently monitored and proposed to be monitored to determine compliance with any dam release requirements?

Dominion Response:
Releases from the dam are currently monitored using the USGS Gauging Station No. 01670400 North Anna River near Partlow, Virginia. This gauge is located on the North Anna River approximately 0.5 miles downstream from the dam. Use of this gauge to monitor dam releases is expected to continue after Unit 3 becomes operational.

DEQ Question 18: Provide information in response to citizen concerns regarding the proposed three inch rise.

Dominion Response:
Dominion conducted an instream flow incremental methodology (IFIM) study at the request of various agencies to assess potential impacts of consumptive water use associated with the proposed Unit 3. As a result of the study, Dominion committed to raise the target normal pool level of Lake Anna by 3 inches from 250 ft msl to 250.25 ft msl to offset the additional withdrawal needed for Unit 3 cooling. As is discussed in our response to Question 14 above, a lake level increase of 3 inches was chosen in order to offset the consumptive use of water while minimizing any potential impacts to the lake shoreline.

Most of the citizen comments received about the 3-inch rise have been favorable. Even so, some concerns have been expressed about the potential impacts of the increased lake level on shorelines. To these concerns, based on the fact that the 3-inch rise is within the current fluctuation of the lake, Dominion anticipates impacts of the 3-inch rise to shorelines and associated infrastructure will be small and localized.

Additionally, Dominion is providing clarification regarding our property rights associated with the land that would be inundated by a 3-inch rise in water level of Lake Anna and the Waste Heat Treatment Facility (WHTF) contemplated with the future operation of proposed Unit 3. As

explained below, Dominion owns all the land under and along the shoreline up to 255 feet msl, which includes any land that would be inundated by the 3-inch rise.

Between 1968 and 1971 Dominion acquired the necessary land to construct the North Anna Power Station, which includes the land that would be impacted by the 3-inch rise. As a result, Dominion owns the bottom land and surrounding shore land of Lake Anna and the WHTF, including the associated riparian rights, up to a height of 255 ft. msl. Dominion acquired these lands through deeds or by condemnation petitions. These legal instruments include recitals that convey to Dominion the right to use the land for operation of the Station, including the right to raise and lower water levels. The standard "Reservoir" deed states:

> Insofar as Owner may lawfully do so, Owner, for himself, his successors and assigns, for the above consideration, does hereby grant and convey to Company [Dominion] the right to maintain and operate the electric generating facilities, dam, reservoir, dikes, cooling lagoons, electric lines and pipe lines, including, without limitation, the raising and lowering of the waters aforesaid and changing the condition of such waters.

This provision applies to any future owners of property around the Lake and the WHTF, including the property now owned by the Department of Conservation and Recreation that comprises Lake Anna State Park.

The majority of these instruments also include reservation clauses that allow the landowners the right to use the shore land and adjacent waters subject to certain limitations. The standard "Reservoir" deed provides:

> There is reserved to Owner the exclusive right, except as herein stated and subject to requirements by regulatory authority, to enter upon, occupy and use for recreational and agricultural purposes any part of the land hereby conveyed to Company which may lie above the fluctuating water line of said reservoir, hereinafter called 'shore land.'

Where the instrument did not contain such a reservation clause, Dominion later granted similar access rights to landowners through license agreements.

The limitations placed on property owners' use of the shore land, in addition to those that may be imposed by federal, state, or local laws or regulations, require the landowners to seek permission from Dominion to place structures along the shore. The standard "Reservoir" deed states:

"[Owner] shall obtain Company's approval of the type and location of such piers, jetties, recreational or protective structures before they are constructed." Dominion grants such permission through construction and use agreements. Further, as owner of the shore land, Dominion retains discretion to require that a structure be removed if determined to be inconsistent with the safe and efficient operation of the Station. In sum, property issues related

to the shore lands would be governed by the applicable deeds, condemnation land records, the license agreements, and the construction and use agreements.

Attached are examples of the deeds and other agreements described above as evidence of Dominion's legal ownership of the shore lands around Lake Anna and the WHTF (Attachment 1). Dominion will provide any additional information with respect to this question at DEQ's request.

DEQ Question 19: Further explain the reason for the different seasonal averages used in the 29 years of record for this JPA versus the IFIM.

Dominion Response:
The Lake Anna Water Budget Model was developed to run for the period of October 1, 1978 through October 31, 2007. This time span was evaluated in the COLA and current JPA. During the development of the IFIM Study, the resource agencies specifically requested that the modeling period correspond with the United States Geological Survey "water year" (defined as October 1 to September 30 of each year). The reason for this was so that the monthly flow statistics contained the same number of values (29) and to avoid bias due to the October statistics, which would have 30 values. Therefore the IFIM study did not incorporate results for October 2007. This difference was noted in the IFIM report.

DEQ Question 20: Explain how flows are currently reduced to 40 and 20 cfs. Is the current procedure proposed to continue after initiation of Unit 3?

Dominion Response:
The Lake Level Contingency Plan that is part of the North Anna Power Station's (Units 1 and 2) VPDES permit requires minimum releases from the dam to support beneficial uses in the North Anna River. North Anna Power Station Operations personnel man the dam 24 hours a day, seven days a week and record the lake level hourly using a staff gauge located on the dam. Station operating procedures are employed to manage the lake level based on the hourly readings.

Releases from the dam are adjusted using a set of spillway gates and the two hydroelectric generating units that are associated with the dam. The spillway gates consist of three (3) tainter (or radial gates) and two (2) skimmer gates. The operating procedure governs the opening position of each of the gates at specific lake levels. For lake levels between 248.1 and 250.1 feet msl, releases from the dam are normally regulated using Skimer Gate 1 and operation of the two hydroelectric generating units. Hydro Unit-5a (with a flow of 40 cfs) is in service when lake level is between 248.1feet and 250.50 feet msl, and Hydro Unit-5b (with a flow of 133 cfs) is in service when lake level is between 250.10 feet and 250.50 feet msl.

When the lake level drops to 248.00' msl dam releases are gradually reduced to 20 cfs in accordance with Special Condition D. *Flow releases and Lake Level Managemen*t of North Anna's VPDES permit. Using Skimmer Gate 2, the releases are stepped down in increments of

approximately 5 cfs with at least a 72-hour period following each incremental reduction prior to any subsequent reduction. The DEQ's Northern Regional Office and VPDES permit-specified downstream users of the North Anna River are notified at least 72 hours prior to the initiation of flow reductions. The releases are maintained at 20 cfs until the lake level returns to 248.1 feet msl. At that time the flow is increased to 40 cfs in 5 cfs increments with a 24-hour wait between each incremental increase.

Dominion anticipates that the current operating procedure (described above) would continue to be implemented once Unit 3 begins operating, except that 250.25' msl would become the new target lake level. Modifications to operating procedures of the dam have not yet been established.

DEQ Question 21: A permit application fee of $25,000 is required for the proposed activity.

Dominion Response:
A permit application fee of $25,000 was sent to DEQ Receipts Control under separate cover. A copy of the letter, application fee form and check are attached to this submittal.

DEQ Additional Information Email; February 15, 2011

DEQ Question 22: Did the IFIM study address off-stream users (e.g., Hanover County)?

Dominion Response:
The IFIM study included intakes/discharges for water users based on VDEQ provided data for the period 2001-2007. Starting with daily predicted flows at the North Anna Dam, flows were interpolated downstream to each of the IFIM transects with the aid of flows measured at the Hart Corner and Hanover USGS gage stations. The daily flows at these gage locations were adjusted to reflect the operating scenario at Lake Anna Dam and water users between the Dam and the USGS gages were taken into account during the interpolation (See Tab 11 of the IFIM Notebook for more detail).

The North Anna IFIM transects on the Piedmont, Fall Zone, and Coastal Plain were located between 0.6 and 25.37 miles below Lake Anna Dam. There were no identified water users along this section of the river. Daily flows for the IFIM analysis were calculated at these 23 transects by interpolating the operating scenario flow at the dam downstream to the USGS Hart Corner gage (mile 29.1). The data from three water users located between the furthest downstream North Anna River IFIM transect (RM 25.37) and the Hart Corner gage were considered as an adjustment to the Hart Corner flows when performing this calculation. A seasonal mean irrigation withdrawal of 0.29 cfs and a 0.17 cfs design *discharge* flow to the river from the Hanover County WTP were not included since they partially compensate for one another, and the net difference was not judged significant relative to the IFIM analysis. A mean 5.25 cfs withdrawal at the Hanover County Water Treatment Plant (WTP) was accounted for when using the Hart Corner USGS data to propagate flows downstream from the dam on a daily basis.

The four IFIM transects on the Pamunkey River were located 59-61 miles below the dam, and 13-15 miles downstream from the Hanover USGS gage. Daily flows for the IFIM analysis at these stations were extrapolated from the USGS Hanover flows corrected by the difference at Lake Anna Dam between existing conditions and the proposed operating scenario. The majority of identified water users along the North Anna (including Kevin Engel, Kings Dominion, and Bear Island Paper) are located between the Hart Corner and Hanover USGS gages, and their withdrawals are therefore reflected in the Hanover flow gage data. The Hanover gage readings also reflect flow additions from the Little River and South Anna River. Between the Hanover gage and the downstream Pamunkey River IFIM transects, there was one identified irrigation withdrawal with a mean seasonal usage of 0.14 cfs. This withdrawal was not included in the IFIM analysis.

The availability of water for other users is most critical during times of low flow. Table 4-1 of the final IFIM Report provides a frequency distribution of flows at the Lake Anna Dam, including existing conditions and the proposed EC/MWC Unit 3 operating scenario. The table indicates that the frequency of a 20 cfs release from the dam would increase from 4.6 percent to 5.5 percent-of-time (a total of 14 additional weeks during the 29 year study period). All of the additional 14 weeks at 20 cfs flows occurred during the months of September to December. Thus the EC/MWC Unit 3 operating scenario should not change the availability of water at low river flows compared to existing conditions during the spring and summer growing season. The increased number of 20 cfs flow weeks during the September to December period indicates that Lake Anna may take a longer time to recover to normal pool following a drought. However, during this "recovery" period, increased runoff and flows would be available in the remainder of the watershed to augment the continuing 20 cfs flow releases from the Lake Anna Dam.

In summary, downstream river discharges and withdrawals provided by VDEQ were addressed in the IFIM study through the use of the Hart Corner and Hanover USGS gage flow data which directly reflected those flow additions and withdrawals, and by any necessary adjustment when interpolating flow between IFIM transect locations (i.e., the Hanover County water withdrawal).

DEQ Question 23: Were the same consumptive volumes used in the IFIM study and the JPA Part III? Also explain where the values in the IFIM originated from and how those values related to those in the ESP and COLA.

Dominion Response:
As discussed in Dominion's response to question #1 above, the consumptive use values presented in the JPA represent the evaporation from the CWS/UHS cooling towers and drift losses. The evaporation from the cooling towers is estimated based on the vendor data as presented above. This vendor data has not changed since the IFIM study. Therefore, the underlying consumptive use calculation has remained the same for the IFIM study, COLA and JPA. It should be noted that the IFIM study evaluated three operating conditions. Because the IFIM study scenario considering three units at NAPS with the target elevation of 250.25 ft msl is the same as the operating conditions presented in the JPA, the consumptive volumes for these

two exercises are the same. The only difference, as noted in the JPA, is that the JPA evaluated a period one month longer than the IFIM study.

The evaporation rates assumed in the ESP were updated following issuance of the ESP to incorporate the latest vendor information regarding cooling tower performance. Additionally, the evaluations in the IFIM, COLA and JPA all evaluated the period extending through 2007 whereas the ESP evaluation extended only through 2003. There are two additional but minor differences between the ESP model and the COLA/JPA/IFIM model:

1. The Unit 3 COLA CWS cooling towers would operate in the same manner as in the ESP, except that the dry tower in COLA would be able to dissipate the entire heat load when the dry bulb temperature is equal to or less than 40°F, which is lower than the 67°F assumed in the ESP water budget model.
2. There is a small increase in the plant service water system heat duty from 2.9×10^8 BTU/hr in the ESP model to 3.0×10^8 BTU/hr in the COLA/JPA/IFIM model.

DEQ Question 24: The IFIM study states that with the 3" rise, lake levels will be higher 75% of the time. Is this relative to 250 ft msl or to the modeling scenario evaluating current operation? If the answer to this question is that it is relative to 250 ft msl, then also discuss the percentage of time the lake level is above 250 ft msl under the existing condition.

Dominion Response:
As presented in the final IFIM report (October 2009, p.37), "the 3-inch increase in lake storage capacity with the alternative [EC/MWC] scenario would maintain lake water surface elevation above existing conditions approximately 75 percent of the time, and better protect river aquatic habitat and recreation, particularly during dry periods." The basis for this was presented in the Final IFIM Notebook (Tab 3, Table 10) which shows the frequency distributions of Lake Anna surface water elevations for the 250.25 ft at EC/MWC versus for existing Units 1 & 2 Operations.

More detailed information is presented in Table 4-9 of the Final IFIM report (October 2009) which shows the monthly differences in lake elevations between existing Unit 1 and 2 operations and the addition of Unit 3 operated under EC/MWC at an increased 250.25 ft elevation. For this option, the median (50 percentile) lake level elevation would be 0.25 ft higher than the existing normal pool elevation from January through May and also in December. During the months of June through November, the change in median water surface elevation would range from 0.01 ft to 0.18 ft (<1 inch to 2.16 inches) higher than the existing normal pool elevation in Lake Anna.

DEQ Question 25: Why does the Lake Anna Water Budget Model utilize a weekly timestep as opposed to a daily timestep?

Dominion Response:
The weekly time step used in the Lake Anna Water Budget Model is consistent with similar long-term water use models, which often use time steps on the order of a month. A shorter time

step, such as daily or sub-daily, tends to introduce unrealistic fluctuations in the model inputs and results. This is primarily because the physical processes involved in a cooling lake system occur on substantially different time scales. For instance, the time scale associated with evaporative loss, which is driven by the surface heat transfer process, is on the order of hours or less, while the time scale associated with the hydrologic and heat transport processes of the circulating water and its heat content traveling through the lake system is on the order of days to weeks. In addition, the basic data used as model input or for model calibration, such as the meteorological data, lake levels, lake temperatures, stream flows and settings of the spillway gates are daily average values, which smooth out the signatures of the various physical processes with sub-daily time scales. As a result, most long-term water use models involving heat transfer and hydrologic processes can predict satisfactorily the behavior of the outcomes including their trends, maxima and minima, but it is not uncommon that there will be a slight time shift between the predicted results and the observed data in a daily or hourly interval. This slight time shift is one of the reasons for the fluctuations in the model inputs and outputs. The accuracy of the observed lake levels can be a potential source of the fluctuations that are manifested in the inflow time series. For example, a 0.01-feet difference in the lake level reading on Model Day One would result in a difference of about 65 cfs in the inflow rate. If the lake level readings are perfect for Model Day Two and thereafter, the inflow rate of Model Day Two would have to be lower or higher by 65 cfs to compensate for the inflow discrepancy on Model Day One. Using a weekly or monthly time step can reduce some of these artificial fluctuations while preserving the inflow volume over the time step, and therefore produce more realistic predictions of the outflow volume and lake storages.

DEQ Question 26: Why did the average evaporation rate increase from the ESP to the COLA but the maximum evaporation rate did not?

Dominion Response:
Several reasons contribute to the increase in the average evaporation rate from the ESP to the COLA:

(1) The evaluations in the IFIM, COLA and JPA all evaluated the period extending through 2007 whereas the ESP evaluation extended through only 2003.
(2) With the 3-inch increase in normal lake level, the percentage of time that the CWS towers are in EC mode would increase, which also means a decrease in the percentage of time that the dry towers would be in service, leading to an increase in the average evaporation rate over the duration of the model period.
(3) There is a small increase in the plant service water system heat duty from 2.9×10^8 BTU/hr in the ESP model to 3.0×10^8 BTU/hr in the COLA/JPA/IFIM model.
(4) Change from 67°F (in ESP) to 40°F (COLA/JPA/IFIM) in the dry bulb temperature limit for full dry tower cooling.

The maximum evaporation rate of Unit 3 would occur when the towers operate in the EC mode and during the most extreme ambient combination of the meteorological condition (air temperature and relative humidity). For the duration of records evaluated in both the ESP and the COLA/JPA/IFIM water budget models, the maximum evaporations occur in the same week

starting July 30 of 1995. Hence, the bounding maximum evaporation rate should not change, despite the very small increase in the plant service water system heat duty.

DEQ Question 27: Why did the average evaporation rate increase from 8,977 gpm without the 3" rise to 9,695 gpm with the 3" rise?

Dominion Response:
The increase in the average evaporation rate is a result of the 3-inch rise in normal lake level. With the 3-inch increase in normal lake level, the percentage of time that the CWS is in EC mode would increase, which also means a decrease in the percentage of time that the dry towers would be in service, leading to an increase in the average evaporation rate over the duration of the model period.

DEQ Question 28: Under the 3" rise scenario, will the maximum lake level reached be higher than that expected under the current operation? If so, will it be higher for extended periods of time?
DEQ Question 29: Provide a timeseries of lake levels above normal pool for the current operation (Units 1&2) and under the proposed operational condition (Unit 3).

Dominion Response:
The Lake Anna Water Budget Model has required revisions in order to simulate lake levels above 250.25 feet msl. Dominion is still in the process of using the Lake Anna Water Budget Model to evaluate whether and to what extent maximum lake levels during high flow events may increase as a result of the three-inch rise. This evaluation also will consider how changes to dam operating procedures might influence the extent and duration of maximum levels under the three-inch rise scenario. Dominion will provide complete responses to these questions once the evaluation is complete.

DEQ Question 30: Improved clarification of water use under the two Unit 3 operational modes, EC and MWC.

Dominion Response:
As discussed in the response to DEQ Question 5, Dominion is providing results from the Lake Anna Water Budget Model for DEQ's use. During a March 15, 2011 conference call, DEQ and Dominion agreed that DEQ staff would use the data to answer Question 30 without additional assistance from Dominion.

DEQ Question 31: Provide a description of the total number of cooling towers and purpose of those towers.

Dominion Response:

The cooling towers associated with the project are for the CWS and UHS systems. The CWS is cooled by the Hybrid Cooling System consisting of two cooling towers: a dry cooling tower and a hybrid cooling tower. The dry tower is composed of multiple cells of finned tube water-to-air heat exchangers with fans providing the motive force to pass air through the tower. Heat is removed without evaporation to reduce the overall water use of the system when operating in Maximum Water Conservation mode. The hybrid cooling tower has a mechanical draft section where the majority of the cooling is performed through evaporation and a dry section that functions like the dry tower. The dry section further reduces the water consumption of the tower and reduces or eliminates the presence of a visible plume leaving the tower. The Hybrid Cooling System provides cooling for the main condenser and other smaller component heat loads in the Turbine Building.

The UHS System has four cooling towers, each with 50% capacity required to cool components located in the Reactor Building. Each cooling tower is a mechanical draft (evaporative) cooling tower with two cells. Generally, only one or two of these cooling towers is in operation at a time. Additional detail is provided in the Response to DEQ Question 8 above.

DEQ Question 32: Provide an explanation of the operational reasons behind Dominion's request for a five day period to switch from EC to MWC? Provide an explanation behind Dominion's request for up to 100 hours/year in EC mode when lake levels are <250.0 ft.?

Dominion Response:
The Hybrid Cooling System is a large cooling system with a system circulating flow rate of approximately 678,000 gallons per minute. When the system is aligned in the EC mode, the dry tower is turned off and may be drained, depending on the manufacturer's recommendations. In order to start the dry tower, the tower will need to be filled with water and the air removed from the heat exchanger tubes. The amount of time required to make this change is not known at this time, because the detailed design has not been completed. The five day period to switch from EC to MWC also allows time to determine whether the lake level condition below 250 ft is a short term transient or a true downward trend in lake level. Five days gives time for environmental conditions to resolve the reduced lake level and avoid unnecessarily perturbing the cooling system. It should be noted that the water budget model used to estimate impacts to the lake level assumed a seven day waiting period to switch from EC to MWC and no waiting period for switching from MWC to EC. This conservatively estimates the impact to lake level.

The request to be allowed 100 hours per year to operate in EC mode (hybrid cooling tower), when lake level is less than 250.0 ft. is to address needs for electricity in times of high demand. The use of this allowance would only occur when the electricity demand on the power grid is high, requiring an expensive off-system purchase of electricity and use of the most expensive generating units to meet demand. It is anticipated that this allowance would typically occur during daylight hours and when the outside ambient temperature is high (greater than 90 degrees Fahrenheit). Under these conditions the dry cooling (MWC mode) is less efficient, so the dry tower fans would be turned off to save energy. When the power grid demand reduces, the fans would be turned back on. Note that for this operating condition, the circulating water would

continue to flow through the dry tower while the fans are off, providing for a faster return to full MWC mode by turning on the fans when the demand is reduced.
Operating in EC mode provides significant savings in power required to operate the system, though the EC mode does consume more water than the MWC mode. Dominion reviewed the proposed increase in water consumption for this operational allowance. The estimated maximum evaporation difference between the two modes based upon the cooling tower model is about 11.1 cfs. Dominion anticipates the actual evaporative difference to be less because operation in EC mode would occur primarily during the daylight hours in this situation. The maximum evaporative loss difference of 11.1 cfs for the entire 100 hour allowance equates to a decrease of approximately 0.1 inch in Lake Anna elevation.

DEQ Additional Information Email; February 25, 2011

DEQ Question 33: Citizens have requested an upgrade to the methods used to regulate water levels in Lake Anna and the WHTF. Does Dominion propose any upgrades to the system used to regulate water levels?

Dominion Response:
The level of the WHTF varies according to the number of circulating water pumps in operation and the operating condition of the nuclear units. Dominion does not propose changes to the system used to regulate water levels beyond changes to the station's dam release operating procedures needed to meet the 250.25 feet msl target normal pool elevation. Dominion believes that the level of Lake Anna and the WHTF have been adequately managed to design specifications using the existing technology. The current technology also is fully capable of managing lake levels consistent with the commitments in the IFIM and the requirements of the Lake Level Contingency Plan.

DEQ Question 34: Provide a discussion of how the IFIM study incorporated the volume of the WHTF.

Dominion Response:
The Lake Anna Water Budget Model assumes that the WHTF is at the same elevation as Lake Anna. This is a conservative assumption as the additional water volume associated with the WHTF typically being maintained at a higher elevation is not considered. The long term median operating level, based on historic data, of Lake Anna is 250.0 feet msl. The long term median operating level of the WHTF is 250.8 feet msl.

Question 35: Address the public comment that the proposed reactor will use more water than the originally proposed reactor.

Dominion Response:
The water use for the proposed reactor is unchanged from the design that was previously considered and the limits set during the Early Site Permit. The proposed design has a slightly

lower thermal rating than the previous design and therefore will use about the same amount of water.

Question 36: Address the public comment that the cooling system proposed for Unit 3 should rely solely on dry cooling.

Dominion Response:
Dominion's selection of a combination wet and dry (hybrid) cooling tower system significantly reduces water use from the once-through cooling water system that was originally proposed, and from what would be expected when using a conventional wet tower cooling system. The dry components of the proposed system allow for water saving during the EC mode of operation and significant water savings when the lake level indicates that water inflow to the lake is reduced and the dry cooling tower is placed in service. The combination wet and dry system provides a good balance of environmental stewardship and energy conservation.
Dominion evaluated the alternative of a 100% dry cooling system for North Anna 3 and determined that the resulting system would consume over three times the energy of the proposed combination wet and dry cooling tower system. The cooling tower would also take up over four times the land area. Further, during hot summer days the all dry cooling system is very inefficient and would result in reduced generating capacity from the station. One variant of dry cooling, known as an "air-cooled condenser", was not considered for North Anna 3 because that technology has never been used for a nuclear power plant, nor for any single unit power generating station of similar size.

DEQ Question 37: Address the public comment requesting a test period of the proposed 3-inch lake level rise.

Dominion Response:
It is Dominion's position that a test period of the proposed 3-inch lake level rise is not necessary or practicable. The proposed new normal pool level, 250.25 feet msl, is within the current fluctuations of Lake Anna and is within the limits of Dominion's property. Additionally, the IFIM study demonstrated that the 3-inch rise is unlikely to adversely affect the functionality of boat ramps and docks. Dominion anticipates that the 3-inch rise will not negatively impact existing beneficial uses.

Implementation of the 3-inch rise will require significant planning and investment including changes to operating procedures and the completion of agreed to mitigation for wetland impacts resulting from inundation. The 3-inch rise will be implemented prior to initiation of the operational water withdrawal for Unit 3. It is Dominion's position that valid justification has been provided to support the rise in the normal pool elevation without a test period.

Attachment 1: Example Agreements

1. Reservoir Deed
2. Waste Heat Treatment Facility Deed
3. Construction and Use Agreement

Reservoir

557.5ZA

It is contemplated that the above mentioned lands, together with other lands, will be used for the construction and operation of electric generating facilities on the North Anna River, including, without limitation, a reservoir to provide cooling water and for other reservoir uses, a dam at a point approximately one mile upstream from the Louisa County–Hanover County line, dikes, water cooling lagoons, electric pole and tower lines, underground electric lines and underground pipe lines. The water in the reservoir may be raised to a height at the dam not exceeding 255 feet above mean sea level as determined from the bench marks of the United States Coast and Geodetic Survey, and the operation of the generating facilities, reservoir, dam, dikes and cooling lagoons will involve raising (to a height at the dam not exceeding 255 feet as hereinabove mentioned) and lowering the waters from time to time as may be deemed advisable by the persons operating them. Insofar as Owner may lawfully do so, Owner, for himself, his successors and assigns, for the above considerations, does hereby grant and convey to Company the right to maintain and operate the electric generating facilities, dam, reservoir, dikes, cooling lagoons, electric lines and pipe lines, including, without limitation, the raising and lowering of the waters as aforesaid and changing the condition of said waters.

The considerations aforesaid shall be in full and total payment for the land and improvements thereon, if any, for all trees, undergrowth or other obstructions on said lands, for all rights hereby granted, and for all damages, if any, to the residue of the lands and other property of Owner.

There is reserved to Owner the exclusive right, except as herein stated and subject to requirements by regulatory authority, to enter upon, occupy and use for recreational or agricultural purposes any part of the land hereby conveyed to Company which may lie above the fluctuating water line of the said reservoir, hereinafter called "shore land". Subject to requirements by regulatory authority, as such requirements may apply to Owner or Company, Owner may construct, maintain and use on such shore land and beyond the same into the waters of said reservoir upon the land hereby conveyed to Company, such piers, jetties or other recreational or protective structures as are not detrimental to the development, operation and maintenance of said electric generating facilities, dam, reservoir, dikes and cooling lagoons, or to the construction, operation and maintenance of electric lines and pipe lines as herein provided, but Owner shall not have the right to construct or maintain any structure for human habitation on any part of said land, and Owner shall obtain Company's approval of the type and location of such piers, jetties, recreational or protective structures before they are constructed. Owner shall retain whatever right and privilege he had prior to the acquisition of his lands hereunder and the establishment of the reservoir to use the waters of the North Anna River or its tributaries for domestic purposes on his remaining lands bordering the land acquired hereunder, subject, however, to the rights granted Company as hereinabove provided. The rights reserved to Owner shall not exclude the right of Company, through its employees or contractors, to enter upon and inspect such shore land, clear the same, remove or keep the same clear of timber, brush, trash, pollutants, structures or obstructions, or to carry out any other activities thereon that the Company may deem necessary for the development, operation and maintenance of such electric generating facilities, dam, reservoir, dikes, cooling lagoons, electric lines and pipe lines. Company will not construct electric pole or tower lines upon the shore land along any route generally paralleling the shore line without the consent of Owner. Owner agrees that he will not cause pollutants to pass across or through the aforesaid shore land nor cause any waste, refuse or trash to be or remain thereon, or maintain thereon any nuisance or permit any structures thereon to become dilapidated, unsightly or unsafe.

All references to Owner and Company shall include their heirs, successors and assigns.

Owner covenants that he has the right to convey the said land to Company, that he has done no act to encumber the said land, that Company shall have quiet possession of said land, free from all encumbrances; and that he, said Owner, will execute such further assurances of said land as may be requisite.

WITNESS the following signature____and seal____:

_____ (SEAL) _____ (SEAL)

_____ (SEAL) _____ (SEAL)

557.51

THIS DEED WITH RESERVATION OF EASEMENT, made this _____ day of _____,

19___, between _____

_____

_____,

hereinafter called "Owner" (whether one or more or masculine or feminine); and VIRGINIA ELECTRIC AND POWER COMPANY, a Virginia corporation, hereinafter called "Company";

WITNESSETH that:

For the sum of $ _____, and other valuable considerations, the receipt whereof is hereby acknowledged, Owner hereby grants and conveys to Company, with General Warranty of Title, all that certain piece or parcel of land in _____ Magisterial District, _____ County, Virginia, with the improvements on said land, as shown on _____ hereto attached and made a part of this deed; the said land being described as follows:

Together with all the privileges, appurtenances and riparian rights belonging or in anywise appertaining thereto; and all rights, title and interest of Owner in and to any private or public ways within said land and in and to the bed of the North Anna River;

WHTF

557.70

It is contemplated that the above mentioned lands, together with other lands, will be used for the construction and operation of electric generating facilities on the North Anna River, including, without limitation, a reservoir to provide cooling water and for other reservoir uses, a dam at a point approximately one mile upstream from the Louisa County–Hanover County line, dikes, water cooling lagoons, electric pole and tower lines, underground electric lines and underground pipe lines. The water in the reservoir may be raised to a height at the dam not exceeding 255 feet above mean sea level as determined from the bench marks of the United States Coast and Geodetic Survey, and the operation of the generating facilities, reservoir, dam, dikes and cooling lagoons will involve raising (to a height at the dam not exceeding 255 feet as hereinabove mentioned) and lowering the waters from time to time as may be deemed advisable by the persons operating them. The cooling lagoons shall be a private water treatment facility and not public bodies of water. Insofar as Owner may lawfully do so, Owner, for himself, his successors and assigns, for the above considerations, does hereby grant and convey to Company the right to maintain and operate the electric generating facilities, dam, reservoir, dikes, cooling lagoons, electric lines and pipe lines, including, without limitation, the raising and lowering of the waters as aforesaid and changing the condition of said waters.

The considerations aforesaid shall be in full and total payment for the land and improvements thereon, if any, for all trees, undergrowth or other obstructions on said lands, for all rights hereby granted, and for all damages, if any, to the residue of the lands and other property of Owner.

There is reserved to Owner the exclusive right, except as herein stated and subject to requirements by regulatory authority, to enter upon, occupy and use for recreational or agricultural purposes any part of the land hereby conveyed to Company which may lie above the fluctuating water line of the said cooling lagoons, hereinafter called "shore land". Subject to requirements by regulatory authority, as such requirements may apply to Owner or Company, Owner may construct, maintain and use on such shore land and beyond the same into the waters of said cooling lagoons upon the land hereby conveyed to Company, such piers, jetties or other recreational or protective structures as are not detrimental to the development, operation and maintenance of said electric generating facilities, dam, reservoir, dikes and cooling lagoons, or to the construction, operation and maintenance of electric lines and pipe lines as herein provided, but Owner shall not have the right to construct or maintain any structure for human habitation on any part of said land, and Owner shall obtain Company's approval of the type and location of such piers, jetties, recreational or protective structures before they are constructed. Owner shall retain whatever right and privilege he had prior to the acquisition of his lands hereunder and the establishment of the cooling lagoons to use the waters of the North Anna River or its tributaries for domestic purposes on his remaining lands bordering the land acquired hereunder, subject, however, to the rights granted Company as hereinabove provided. The rights reserved to Owner shall not exclude the right of Company, through its employees or contractors, to enter upon and inspect such shore land, clear the same, remove or keep the same clear of timber, brush, trash, pollutants, structures or obstructions, or to carry out any other activities thereon that the Company may deem necessary for the development, operation and maintenance of such electric generating facilities, dam, reservoir, dikes, cooling lagoons, electric lines and pipe lines. Company will not construct electric pole or tower lines upon the shore land along any route generally paralleling the shore line without the consent of Owner. Owner agrees that he will not cause pollutants to pass across or through the aforesaid shore land nor cause any waste, refuse or trash to be or remain thereon, or maintain thereon any nuisance or permit any structures thereon to become dilapidated, unsightly or unsafe. The rights of Owner specified in this paragraph may be limited, modified or revoked by the Company without compensation to Owner, but only in the event and to the extent that such limitation, modification or revocation is necessary in order to preserve the character and maintain the operation of the cooling lagoons as a private water treatment facility.

All references to Owner and Company shall include their heirs, successors and assigns.

Owner covenants that he has the right to convey the said land to Company, that he has done no act to encumber the said land, that Company shall have quiet possession of said land, free from all encumbrances; and that he, said Owner, will execute such further assurances of said land as may be requisite.

WITNESS the following signature___ and seal___:

_____(SEAL)	_____(SEAL)
_____(SEAL)	_____(SEAL)
_____(SEAL)	_____(SEAL)
_____(SEAL)	_____(SEAL)

557.65

THIS DEED, made this _____ day of _____, 19___, between

_____

_____

_____

hereinafter called "Owner" (whether one or more or masculine or feminine); and VIRGINIA ELECTRIC AND POWER COMPANY, a Virginia corporation, hereinafter called "Company";

WITNESSETH that:

For the sum of $_____, and other valuable considerations, the receipt whereof is hereby acknowledged, Owner hereby grants and conveys to Company, with General Warranty of Title, all that certain piece or parcel of land in _____ Magisterial District, _____ County, Virginia, with the improvements on said land, as shown on _____ hereto attached and made a part of this deed; the said land being described as follows:

Together with all the privileges, appurtenances and riparian rights belonging or in anywise appertaining thereto; and all rights, title and interest of Owner in and to any private or public ways within said land and in and to the bed of the North Anna River.

Dominion

Construction and Use Agreement

Virginia Electric and Power Company

North Anna Power Station
Post Office Box 402
Mineral, Virginia 23117

Date

You have requested that Virginia Electric and Power Company d/b/a Dominion (company) agree to your construction and use of a

_____

(herein called facility) on company-owned land in _____ County, Virginia, at the location marked in ink on the attached print. The company hereby agrees to your request, in consideration of your agreement to conduct any such construction and use according to the following conditions:

1. You shall construct such facility substantially in accordance with the attached sketch and in such manner as not to hinder or interfere with the use of the reservoir/lagoon by your neighbors or others.
2. You shall construct any such facilities between lines extended into the water generally at right angles to the shoreline.
3. You shall not use this facility for human habitation.
4. All work to be performed on company property under this agreement shall be at your sole cost and expense, with no direct or consequent expense to the company.
5. You shall not deposit excavated earth or debris on company land and you shall remove from company land all trees, limbs, stumps, brush or other debris which may be cut or removed from place or brought to the site in connection with work to be performed by you.
6. You shall not permit any nuisance or unsighlly remains or structure to be placed or maintained on, in or around company property before, during or after the performance of any work or use authorized pursuant to this agreement.
7. The work to be performed by you shall comply with all applicable Federal, State or local laws, ordinances or regulations. Specifically, you shall obtain all necessary permits for any work performed pursuant to this agreement. Upon your request the company can provide you with the names and addresses of certain governmental agencies from whom you must obtain permits before commencing work on this project. This list is for your convenience only and does not constitute an opinion by the company as to the full range of regulatory permits required for the construction and use of the facility.
8. This agreement shall not constitute a disposition of any interest in company property and the activity herein agreed to shall not in any way interfere with the company's lawful operation of the Power Station, including flooding company land and maintaining the reservoir and lagoons in a manner consistent with all rights and privileges conferred upon the company. To the extent that any alteration of company property, including the erection of any structure thereon shall be reasonably determined by the company to be inconsistent with the safe and efficient operation of the Power Station, you shall restore such property to its original condition, or remove such structure upon request of the company, and at your own expense.
9. Any and all structures erected by you on company property shall constitute structures appurtenant to your real property. You shall be exclusively responsible for their maintenance, or the effects of any defects thereof.
10. No structure appurtenant, constructed pursuant to this agreement, shall be sold separately from the real property to which it is appurtenant. In the event that your real property should be sold, the purchaser thereof shall expressly assume in writing all duties arising from this agreement. In the event that a subsequent purchaser should not assume such duties, the company may elect to remove any structure erected pursuant to this agreement, and/or restore company property to its approximate original condition at your expense.
11. The slopes of any area to be excavated by you or any excavation or dredging activity undertaken pursuant to this agreement shall comply with the applicable standards, criteria and guidelines published in the Virginia Erosion and Sediment Control Handbook, under the authority of the Virginia Soil and Water Conservation Commission.
12. You hereby agree to indemnify and save harmless the company, its officers, agents and employees from any and all claims, demands, damages, actions, causes of action, injury to persons or property and liability or losses resulting directly or indirectly from any action taken by you, your agents, employees or contractors (including presence upon company property) pursuant to this agreement.
13. If any provision of this agreement, or the application of any provision of this agreement to any person or circumstance, is held unenforceable for any reason, the application of such provision to any other person or circumstance and the remainder of the agreement shall not be affected thereby.

To evidence your acceptance of this agreement upon the conditions stated above, please sign and return both copies of this agreement.

_____
Dominion Representative (Signature)

We, the undersigned, hereby agree to and accept the conditions set forth in this agreement.

_____
Landowner (Signature)

Dated: _____

_____
Landowner Name (Print)

_____
Address

Distribution: White–Real Estate/NSS Department; Canary–Landowner

Form No. 727857(Oct 2000)

Pamela F. Faggert
Vice President and Chief Environmental Officer

Dominion Resources Services, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

Dominion®

Certified Mail
Return Receipt Requested

April 8, 2011

Virginia Department of Environmental Quality
Receipts Control
P.O. Box 1104
Richmond, VA 23218

RE: Dominion North Anna Power Station Unit No. 3 (DEQ #10-2001)
Part III-Major Surface Water Withdrawal for Operational Activities
Permit Application Fee

Dear Sir/Madam:

Enclosed are the permit application fee form and check for $25,000.00 for Dominion's application for a major surface water withdrawal associated with the North Anna Power Station Unit 3 project (DEQ #10-2001).

If you have any questions, please contact Jason Ericson at (804) 273-3485.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Attachments

DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
PERMIT APPLICATION FEE FORM
EFFECTIVE JANUARY 1, 2008

INSTRUCTIONS

Applicants for individual Virginia Pollutant Discharge Elimination System (VPDES), Virginia Pollution Abatement (VPA), Virginia Water Protection (VWP), Surface Water Withdrawal (SWW), and Ground Water Withdrawal (GWW) Permits are required to pay permit application fees, except farming operations engaged in production for market. Fees are also required for registration for coverage under General Permits except for the general permits for sewage treatment systems with discharges of 1,000 gallons per day (GPD) or less and for Corrective Action Plans for leaking underground storage tanks. Except for VWP permits, fees must be paid when applications for permit issuance, reissuance* or modification are submitted. Applicants for VWP permits will be notified by the DEQ of the fee due. Applications will be considered incomplete if the proper fee is not paid and will not be processed until the fee is received. (* - the reissuance fee does not apply to VPDES and VPA permits - see the fee schedule included with this form for details.)

The permit fee schedule is included with this form. Fees for permit issuance or reissuance and for permit modification are included. Once you have determined the fee for the type of application you are submitting, complete this form. The original copy of the form and your check or money order payable to "Treasurer of Virginia" should be mailed to:

Department of Environmental Quality
Receipts Control
P.O. Box 1104
Richmond, VA 23218

A copy of the form and a copy of your check or money order should accompany the permit application. You should retain a copy for your records. Please direct any questions regarding this form or fee payment to the DEQ Office to which you are submitting your application.

APPLICANT NAME: Virginia Electric and Power Company; DBA Dominion Virginia Power

ADDRESS: 5000 Dominion Blvd

Glen Allen, Virginia 23060

DAYTIME PHONE: (804) 273-3485 (Area Code)

IRS Employer Identification Number (EIN): [*aka* Federal Tax Identification Number (FIN)] 54-0418825

FACILITY/ACTIVITY NAME: North Anna Power Station Unit 3 Major Water Withdrawal

LOCATION: Louisa County, Virginia

TYPE OF PERMIT APPLIED FOR: (from Fee Schedule - see back of form) VWP Individual Water Withdrawals > 3,000,000 gallons per day

TYPE OF ACTION: ☒ New Issuance ☐ Reissuance ☐ Modification

AMOUNT OF FEE SUBMITTED (from Fee Schedule): $25,000.00

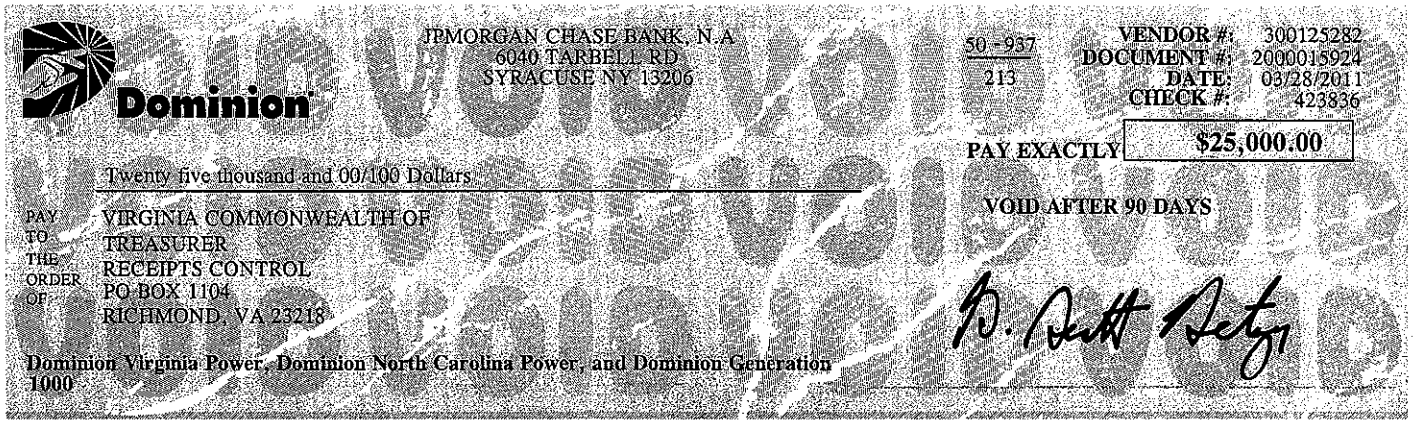
EXISTING PERMIT NUMBER (if applicable):

DEQ OFFICE TO WHICH APPLICATION SUBMITTED (check one)

☐ Abingdon/SWRO	☐ Harrisonburg/VRO	☒ Woodbridge/NVRO	☐ Lynchburg/BRRO-L
☐ Richmond/PRO	☐ Richmond/Headquarters	☐ Roanoke/BRRO-R	☐ Virginia Beach/TRO

FOR DEQ USE ONLY
Date: _____
DC #: _____

Original Form and Check - DEQ Receipts Control, Richmond
Copy of Form and Copy of Check - DEQ Regional Office or Permit Program Office



Dominion

JPMORGAN CHASE BANK, N.A.
6040 TARBELL RD
SYRACUSE NY 13206

50 - 937
213

VENDOR #: 300125282
DOCUMENT #: 2000015924
DATE: 03/28/2011
CHECK #: 423836

PAY EXACTLY $25,000.00

Twenty five thousand and 00/100 Dollars

VOID AFTER 90 DAYS

PAY TO THE ORDER OF
VIRGINIA COMMONWEALTH OF
TREASURER
RECEIPTS CONTROL
PO BOX 1104
RICHMOND, VA 23218

Dominion Virginia Power, Dominion North Carolina Power, and Dominion Generation
1000

⑈423836⑈ ⑆021309791⑆ 6018500761⑈

Dominion Virginia Power, Dominion North Carolina Power, and Dominion Generation

Tired of receiving payments by check? Electronic Funds Transfer (EFT) is the best way to go!
No more mailing delays or lost checks. Payments will be deposited as an ACH credit directly into your bank account. Special remittance requirements may prevent or delay setting up EFT.
Visit our website at: http://www.dom.com/about/supply/accts_payable/index.jsp or call the AP Dept (804) 771-6200.

VENDOR #: 300125282
CHECK NO: 423836
DATE: 03/28/2011
DOCUMENT#: 2000015924

REFERENCE	INVOICE NO.	DATE	PURCHASE ORDER #	GROSS AMOUNT	DEDUCTIONS	NET AMOUNT
1900019032 1000 North Anna 3 VWP	EF0000014980 10-2001 Permit Fee	03/21/11		$25,000.00		$25,000.00