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January 28, 2011

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BELL BEND NUCLEAR POWER PLANT
BBNPP PLOT PLAN CHANGE COLA
SUPPLEMENT, PART 3 (ER); SECTION 3.3
BNP-2011-025 Docket No. 52-039

References: 1) BNP-2010-175, T. L. Harpster (PPL Bell Bend, LLC) to U.S. NRC, "July 2010 BBNPP Schedule Update", dated July 16, 2010

2) BNP-2010-231, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "Clarification of Schedule for COLA Part 11 Reports," dated September 10, 2010

3) BNP-2010-246, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "BBNPP Plot Plan Change Supplement Schedule Update," dated September 28, 2010

In References 1, 2, and 3, PPL Bell Bend, LLC (PPL) provided the NRC with schedule information related to the intended revision of the Bell Bend Nuclear Power Plant (BBNPP) footprint within the existing project boundary which has been characterized as the Plot Plan Change (PPC). As the NRC staff is aware, the plant footprint relocation will result in changes to the Combined License Application (COLA) and potentially to new and previously responded to Requests for Additional Information (RAIs). PPL declassified this docketed schedule information from regulatory commitment status in Reference 3, with an agreement to update the staff via weekly teleconferences as the project moves forward.

PPL has committed to provide the NRC with COLA supplements, consisting of revised COLA Sections and associated RAI responses/revisions, as they are developed. These COLA supplements will only include the changes related to that particular section of the COLA and will not include all conforming COLA changes. Conforming changes for each supplement necessary for other COLA sections will be integrated into the respective COLA supplements and provided in accordance with the schedule, unless the supplement has already been submitted. In the latter case, the COLA will be updated through the normal internal change process. The revised COLA supplements will also include all other approved changes since the submittal of Revision 2. All COLA supplements and other approved changes will ultimately be incorporated into the next full COLA revision.

The enclosure provides the revised BBNPP COLA Supplement, Part 3 (Environmental Report), Section 3.3, Revision 2c. The revised BBNPP COLA section supersedes previously submitted information in its entirety.

No open RAIs are associated with the enclosed COLA section. No previously submitted responses to RAIs are affected by the changes shown in the enclosed COLA section. No departures and/or exemptions from the U.S. EPR FSAR for this BBNPP COLA section have

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been created or revised as a result of the PPC. No new or revised RAI responses are included in this transmittal.

The only new regulatory commitment is to include the revised COLA section (Enclosure) in the next COLA revision.

If you have any questions, please contact the undersigned at 570.802.8102.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 28, 2011

Respectfully,

Rocco R. Sgarro

RRS/kw

Enclosure: Revised BBNPP COLA Part 3 (ER); Section 3.3, Revision 2c cc: (w/o Enclosures)

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Enclosure

Revised BBNPP COLA Part 3 (ER), Section 3.3, Revision 2c

3.3 PLANT WATER USE

The Bell Bend Nuclear Power Plant (BBNPP) requires water for cooling and operational uses. Sources for water include the Susquehanna River and municipal water from the Berwick District of Pennsylvania American Water Company (PAW). Water from the Susquehanna River provides makeup water for plant cooling and power plant operations. Municipal water provided by the PAW is used to satisfy the demands of potable, sanitary and miscellaneous plant systems. PAW obtains water from four groundwater wells located in Berwick, PA with a maximum daily capacity of 3,194 gpm (12,090 lpm) (PAW, 2008). Figure 3.3-1 and Table 3.3-1 quantitatively illustrate the average and maximum water flows to and from various plant systems for normal plant operating conditions and normal shutdown/cooldown conditions, respectively. Flow rates for other plant modes are not applicable since there is no change in demand during startup or refueling operating conditions. The average flows represent continuous plant water usage requirements whereas the maximum flows represent intermittent demands. Water use by non-plant facilities includes potable and sanitary needs for administrative buildings and warehouses, and water required for landscaping maintenance. Potable water demand is based on projected staffing during normal plant operation. Other station water users, as noted above, have not been included in the estimated demand. However, the municipal water supply is expected to meet the needs of non-plant facilities, because the potable water main header is designed for peak load provisions.

3.3.1 Water Consumption

Primary water consumption is for turbine condenser cooling. Cooling water for the turbine condenser and closed cooling heat exchanger for normal plant operating conditions is provided by the Circulating Water System (CWS), which is a non-safety-related interface system. Circulating water for condenser heat dissipation is taken from the Susquehanna River and will normally be withdrawn at an average rate of 23,808 gpm (90,113 lpm). A small fraction of the intake water will be used to clean debris from the traveling screens. The CWS discharges the heated water from the condenser to the CWS cooling towers. For the closed-loop CWS cooling towers, approximately two thirds of the water will be lost to the atmosphere as evaporation and to cooling tower drift (i.e., consumptive use). The other third will be released as blowdown. Therefore, the average consumptive use of Susquehanna River water during CWS normal operating conditions will be approximately 6.9 E+08 gallons per month (2.6 E+09 liters per month). Although consumptive rates may fluctuate during droughts, the elevation of pump suction at the CWS Makeup Water Intake Structure will be lower than the one day, 100-year low flow water level for the Susquehanna River, allowing for continuous plant operation. Because the pumps and associated electrical equipment are located at an elevation that is above both the 100-year flood level and the flood of record, there will be no high water limit for their operation that would affect water withdrawal during periods of flooding on the Susquehanna River. During normal shutdown/cooldown conditions, the maximum flow of water required by the CWS will be the same as during normal operating conditions.

A secondary source of water consumption is for makeup to the Essential Service Water System and other plant uses. Mechanical draft cooling towers with water storage basins (i.e., one basin for each of the four trains) comprise the Ultimate Heat Sink (UHS) which functions to dissipate heat rejected from the Essential Service Water System (ESWS). The ESWS is vital for all phases of plant operation and is designed to provide cooling water during power operation and shutdown of the plant. Under normal operating and normal shutdown/cooldown conditions, the ESWS cooling tower water storage basins will be supplied with non-safety-related makeup water pumped from the Raw Water Supply System (RWSS) at an average rate of 1,713 gpm (6,484 lpm). The makeup water serves to replenish water losses due to cooling tower evaporation and drift at a rate of 1,142 gpm (4,322 lpm) and 2 gpm (8 lpm), respectively. The remaining water is released to the Susquehanna River as ESWS cooling tower blowdown at an average rate of 569 gpm (2,154 lpm). For normal operation, ESWS water consumption will average approximately 4.9 E+07 gallons per month (1.9 E+08 liters per month). Consumptive rates should not vary during dry periods. During normal plant shutdown/cooldown, when all four trains of the ESWS are operating and assuming a maximum makeup flow rate of 856 gpm (3,242 lpm) for each ESWS cooling tower, the peak water demand will be 3,426 gpm (12,967 lpm). The maximum water flow will be provided by the RWSS and from water stored in the ESWS cooling tower basins. Peak water demand will only be for a short period of time.

The ESWS cooling towers are connected to the remainder of the ESWS through intake and discharge paths. The ESWS takes suction from the ESWS cooling tower basins and cools the Component Cooling Water System (CCWS) heat exchangers. The CCWS is a closed-loop cooling water system that in conjunction with the ESWS provides a means to cool the reactor core, removing heat generated from plant essential and non-essential components connected to the CCWS.

During a design basis accident, the ESWEMS Retention Pond will provide safety-related makeup water for the ESWS cooling tower, for the UHS functions. The ESWEMS Retention Pond is supplied with filtered Susquehanna River water by the RWSS. Because of the nominal surface area of the ESWEMS Retention Pond, evaporation will be minor and vary seasonally. However, since the consumptive rate for accidents is not associated with normal modes of plant operation, this rate is not shown on the water use diagram, Figure 3.3-1.

Sustained RWSS water demand for power plant makeup is 117 gpm (443 lpm) and includes water supplies for the Demineralized Water Distribution System, Floor Wash Drains, and the Fire Water Distribution System. The Demineralized Water Distribution System produces and delivers demineralized water to the power plant for systems that need high quality, non-safety makeup water. Except for containment isolation, the Demineralized Water Distribution System interfaces are non-safety-related. Under normal system operation, water consumption by the Demineralized Water Distribution System is 80 gpm (303 lpm). During normal shutdown/cooldown conditions, water consumption is also anticipated to be approximately 80 gpm (303 lpm). Makeup water to the Demineralized Water Distribution System that is supplied from the RWSS will be pretreated to remove dissolved solids using dual media filters, which will require an additional flow of 27 gpm (102 lpm) to account for filter reject. During normal plant operation, the Potable and Sanitary Water Distribution System supplies consumers with pre-treated water (i.e., Drinking Water Supply) at an average rate of 103 gpm (390 lpm). Due to potential surges in demand, water consumption during normal shutdown/cooldown conditions is anticipated to be 236 gpm (893 lpm). The system provides water for human consumption and sanitary cleaning purposes, and can be used by other systems as a water source. Plant water usage for just non-plant users is estimated to be 10 gpm (38 lpm) during normal plant operation and 20 gpm (76 lpm) during shutdown/cooldown conditions. The Potable and Sanitary Water Distribution System is not connected with any radioactive source or other system which may contain substances harmful to the health of personnel. Failures in the Potable and Sanitary Water Distribution System will have no consequences on plant operation or safety functions. Similarly, the Fire Water Distribution System is classified as a non-safety system. It is required to remain functional following a plant accident, to provide water to hose stations in areas containing safe shutdown equipment. Water consumed by the Fire Water Distribution System during normal conditions is required to maintain system availability. The maximum consumptive rate accounts for system actuation. During normal operation, water consumed by the Fire Water Distribution System is due to system leakage and periodic testing. The maximum consumptive rate is based on meeting the National Fire Protection Association (NFPA)'s requirements for replenishing fire protection water storage. The average and maximum flows for powerplant floor wash drains are anticipated to be the same.

Miscellaneous low volume waste generated by demineralizer makeup reject, other BBNPP plant systems, and treated radiological liquid waste are discharged at a combined average rate of 77 gpm (292 lpm). This equates to an average consumptive rate of 40 gpm (151 lpm) for power plant makeup, or 1.7 E+06 gallons per month (6.5 E+06 liters per month). As previously stated, water consumption may vary during drought conditions. Also, as previously stated, there will be no high water limit due to flooding. Maximum water flow required for power plant makeup during normal shutdown/cooldown conditions is 737 gpm (2,790 lpm).

Prior to discharge into the Susquehanna River, CWS cooling tower and ESWS cooling tower blowdown, and miscellaneous low volume waste are directed to the Combined Waste Water Retention ~~Basin.~~Pond. Wastes resulting from the backwash of the RWSS filtration system and reject from the Demineralized Water Distribution System filtration equipment will also collect in the Combined Waste Water Retention ~~Basin.~~Pond. RWSS Pump Strainer Cleaning Water Discharge and River Intake Screen Cleaning Water are directly discharged to the Susquehanna River. The Combined Waste Water Retention ~~Basin~~Pond serves as an intermediate discharge reservoir. During plant startup, startup flushes and chemical cleaning wastes will first collect in temporary tanks or bladders, and will then be discharged into the Combined Waste Water Retention ~~Basin.~~Pond. Treated liquid radwastes are discharged downstream of the Combined Waste Water Retention ~~Basin~~Pond directly to the final plant discharge.

Total water demand for the Susquehanna River during normal operations is 25,729 gpm (97,383 lpm). From this total, 8,654 gpm (32,755 lpm) is returned to the Susquehanna River from the Combined Waste Water Retention ~~Basin~~Pond and 11 gpm (42 lpm) from treated liquid radwaste. Consumptive water losses are 17,024 gpm (64,311 lpm) from evaporation and drift in the CWS and ESWS cooling towers and 40 gpm (151 lpm) for power plant systems. Therefore, the total average consumptive use of Susquehanna River water during normal operating conditions will be approximately 7.37 E+08 gallons per month (2.8 E+09 liters per month).

Section 2.3.2 provides a discussion of permitted activities associated with plant water consumption. Section 4.2 provides a discussion of limitations and restrictions on water consumption during construction activities.

3.3.2 Water Treatment

Water treatment will be required for both influent and effluent water streams. The source of cooling and plant makeup water for BBNPP will be Susquehanna River water. Table 3.3-2 lists the principal water treatment systems and treatment operating cycles. The types, quantities and points of addition of chemical additives to be used for water treatment are also indicated.

The Circulating Water Treatment System provides treated water for the CWS and consists of three phases: makeup treatment, internal circulating water treatment and blowdown treatment. Makeup treatment will consist of a biocide (i.e., sodium hypochlorite) injected into Susquehanna River water influent at the CWS Makeup Water Intake Structure to minimize microbiological growth and control fouling in service water piping. Treatment for internal circulating water components (i.e., piping between the cooling towers and condensers) may utilize existing power industry control techniques consisting of intermittent chlorination for no more than two hours per day, acid addition for alkalinity and pH control, and the addition of scale and corrosion inhibitors. Treatment will improve makeup water quality and allow for increased cycles of concentration in the cooling towers. The use of water treatment chemicals will be regulated under a National Pollutant Discharge Elimination System (NPDES) discharge permit. Blowdown treatment will depend on water chemistry, but is anticipated to include the application of a dechlorination chemical (i.e., sodium bisulfite) at the Combined Waste Water Retention ~~Basin~~Pond outlet to reduce the effluent concentration of residual chlorine.

The RWSS Water Treatment System provides treated water for the ESWS and power plant makeup, including the Demineralized Water Distribution System and the Fire Water Distribution System. Raw water from the Susquehanna River is pumped from the intake pumphouse, which is shared with the CWS intake pumps, to the Water Treatment Building, and then filtered to remove suspended solids. Dual media filters comprised of silica sand and anthracite will be used to treat the raw Susquehanna River water. Raw water makeup to the RWSS at the intake pumphouse will receive the same treatment as described above for the CWS. Zebra mussels have been observed along the North Branch of the Susquehanna River, therefore chemical treatment may be required for their control.

The ESWS water chemistry will be maintained by the ESWS Water Treatment System, which is a nonsafety-related system designed to treat water received from the RWSS for normal operating and normal shutdown/cooldown conditions. Treatment of internal circulating water, and blowdown will be similar to the Circulating Water Treatment System described above. During design basis accident conditions, the ESWS Water Treatment System is assumed to be non-operational.

Filtered Susquehanna River water from the RWSS will receive additional treatment from the Demineralized Water Treatment System, which provides demineralized water to the Demineralized Water Distribution System. During normal operation, demineralized water is delivered to power plant consumers. In addition to meeting secondary and primary water chemistry specifications for the U.S. EPR, treatment techniques will meet makeup water treatment guidance set by the Electric Power Research Institute, and may include reverse osmosis, ion-exchange demineralization, and the addition of corrosion inhibitors.

The Potable and Sanitary Distribution System will utilize municipal water supplied by PAW. PAW will deliver water that meets the Commonwealth of Pennsylvania's potable (drinking) water program and the standards of the U.S. EPA for drinking water quality under the National Primary Drinking Water Regulation (NPDWA) and National Secondary Drinking Water Regulation (NSDWA). The system will be designed to function during normal operation and outages (i.e., shutdown).

As described below, liquid wastes refers to waste water. Liquid wastes generated by the plant during all modes of operation will be managed by the Liquid Waste Storage System and the Liquid Waste Processing System. The Liquid Waste Storage System collects and segregates incoming waste streams between radioactive and non-radioactive sources, provides initial chemical treatment of those wastes, and delivers them to one or another of the processing systems. The Liquid Waste Processing System separates waste waters from radioactive and chemical contaminants. The treated water is returned to the Liquid Waste Storage System for monitoring and eventual release. Chemicals used to treat waste water for both systems include sulfuric acid for reducing pH, sodium hydroxide for raising pH and an anti-foaming agent, complexing agent and/or precipitant for promoting settling of precipitates.

Sanitary Waste Water from the plant will be discharged to the Berwick Area Joint Sewer Authority via a lift station that will pump sanitary waste to a sewer main on U.S. Route 11.

Effluents from water treatment systems discharged to the Susquehanna River will meet chemical and water quality limits established in the National Pollutant Discharge Elimination System (NPDES) permit for BBNPP. Section 5.2 provides a discussion on effluent limitations and permit conditions.

3.3.3 References

PAW, 2008. 2007 Annual Water Quality Report, Berwick, PWS ID: PA4190013, Pennsylvania American Water, 2008.

SRBC, 2007. Review and Approval of Projects, 18 CFR Part 806, Susquehanna River Basin Commission, February 2007.

Table 3.3-1— Anticipated Water Use
(Page 1 of 2)

Water Streams	Average Flow [a] gpm (lpm)	Maximum Flow [b] gpm (lpm)
Susquehanna River Water Demand	25,729 (97,384)	28,179 (106,656)
CWS Makeup Water Intake Structure Screen Cleaning Water [c]	---	---
Raw Water Supply System (RWSS)	1,921 (7,271)	4,371 (16,544)
RWSS Pump Strainer Cleaning Water [c]	---	---
RWSS Filter Backwash [d]	91(344)	208 (787)
Essential Service Water System(ESWS)/Ultimate Heat Sink (UHS) Makeup [e, f]	1,713 (7,124)	3,426 (12,967)
ESWS Cooling Tower Evaporation [f]	1,142 (4,322)	2,284 (8,645)
ESWS Cooling Tower Drift [f]	2 (8)	4 (15)
ESWS Cooling Tower Blowdown [f]	569 (2,154)	1,138 (4,307)
Power Plant Makeup	117 (443)	737 (2,790)
Demineralized Water Distribution System [g]	107 (405)	107 (405)
Fire Water Distribution System [h]	5 (19)	625 (2,366)
Floor Wash Drains	5 (19)	5 (19)
ESWEMS Retention Pond [c]	---	---
Circulating Water System (CWS) [i]	23,808 (90,113)	23,808 (90,113)
CWS Cooling Tower Evaporation [i]	15,872 (60,076)	15,872 (60,076)
CWS Cooling Tower Drift [i]	8 (30)	8 (30)
CWS Cooling Tower Blowdown [i]	7,928 (30,007)	7,928 (30,007)
Municipal Water Demand (PAW) (Groundwater)	103 (390)	236 (893)
Potable and Sanitary Water Distribution System [j]	103 (390)	236 (893)
Plant Users [k]	93 (352)	216 (818)
Non-Plant Users [l]	10 (38)	20 (76)
Effluent Discharge to Susquehanna River	8,665 (32,797)	9,367 (35,454)
Combined Waste Water Retention ~~Basin~~Pond Discharge [m]	8,654 (32,755)	9,356 (35,412)
RWSS Filter Backwash Discharge	91 (344)	208 (787)
Miscellaneous Low Volume Waste [n]	39 (148)	55 (208)
Demineralizer Feed Filter Reject [g]	27 (102)	27 (102)
ESWS Cooling Tower Blowdown	569 (2,154)	1,138 (4,307)
CWS Cooling Tower Blowdown	7,928 (30,007)	7,928 (30,007)
Startup Temporary Storage Discharge [o]	---	---
Treated Liquid Radwaste [m]	11 (42)	11 (42)
River Intake Screen Cleaning Water Discharge [c]	---	---
RWSS Pump Strainer Cleaning Water Discharge [c]	---	---
Effluent Discharge to Municipal Sewer (Berwick Area Joint Sewer Authority)		
Sanitary Waste [p]	103 (390)	236 (893)
Consumptive Water Losses (Surface Water and Groundwater)	17,064 (64,587)	18,812 (71,203)
ESWS Cooling Tower Evaporation [f]	1,142 (4,322)	2,284 (8,645)
ESWS Cooling Tower Drift [f]	2 (8)	4 (15)
CWS Cooling Tower Evaporation [i]	15,872 (60,076)	15,872 (60,076)
CWS Cooling Tower Drift [i]	8 (30)	8 (30)
Power Plant Systems [q]	40 (151)	644 (2,438)

Table 3.3-1— Anticipated Water Use

(Page 2 of 2)

Water Streams	Average Flow [a] gpm (lpm)	Maximum Flow [b] gpm (lpm)

Key:
gpm - gallons per minute
lpm - liters per minute
Notes:
a. Average flow represents the expected water consumptive rates and returns for normal plant operating conditions.
b. Maximum flow represents water consumptive rates and returns during normal shutdown/cooldown.
c. Makeup flows and discharges associated with river intake screen cleaning, RWSS pump strainer cleaning, and the ESWEMS Retention Pond during normal operations and shutdown/cooldown are anticipated to be minimal.
d. It is assumed that less than 5% of the RWSS flow will be used as filter backwash
e. Two trains will be operating under normal conditions and four trains during shutdown/cooldown. Refer to Section 3.4.1.2.
f. The ESWS cooling tower evaporation rate is identified in U.S. EPR FSAR Table 9.2.5-2. Makeup and blowdown flows are calculated based on the assumption that the cooling towers will operate at 3 cycles of concentration.
g. It is assumed that makeup water from the RWSS to the Demineralized Water Distribution System will require treatment with filters prior to other treatment steps and that approximately 25% of the makeup flow will be discharged as filter reject water.
h. During normal operating conditions, water consumed by the Fire Water Distribution System is attributed to system leakage and periodic testing. The maximum consumptive rate is based on meeting the National Fire Protection Association's requirement for replenishing fire protection water storage.
i. Average and maximum evaporation, drift and blowdown flows for the CWS cooling tower are based on the assumption that the tower will operate at 3 cycles of concentration.
j. The average and maximum water demand of the Potable and Sanitary Water Distribution System is estimated based on the sum of the continuous flows calculated for the Power Plant and the sum of the continuous flows plus the maximum process-related intermittent flow, respectively.
k. The average flow for potable and sanitary water demand is based on projected staffing during normal plant operation.
l. Non-plant water users include potable and sanitary needs for administrative buildings and warehouses, and water required for landscaping maintenance. Non-plant water users have not been included in the estimated demand. However, the municipal water supply is expected to accommodate other station water users since the potable water main header is designed for a peak load.
m. Treated liquid radwaste will not be discharged to the Combined Waste Water Retention ~~Basin.~~Pond. Rather, it will be piped to a discharge line downstream of the retention ~~basin.~~pond.
n. Average and maximum flows for miscellaneous low volume waste are estimated as the sum of miscellaneous low volume wastes and discharges from Other Plant Systems.
o. Startup effluents occur during plant startup; the effluents will be stored within tanks or bladders, which will be removed once startup is complete. Makeup and discharge flows associated with startup are anticipated to be minimal.
p. Maximum flow for sanitary waste is taken as the design flow under normal plant operating conditions.
q. The consumptive water loss from power plant systems is estimated at 40 gpm (151 lpm).

Table 3.3-2— Water Treatment Systems
(Page 1 of 2)

System	Operating Cycle(s)	Points of Addition	Chemical Processed	Estimated Total Amount Used per Year
Circulating Water Treatment System[a]	Normal Operating Conditions and Normal Shutdown/ Cooldown	CWS Makeup/Water Intake CWS Piping CWS Blowdown/ Retention ~~Basin~~Pond Outlet	Oxidizing Biocide (Sodium Hypochlorite)	248,033 gal (938,805 l)
			Deposit Control Agents (organic phosphonate and acrylate copolymer)	172,929 lbs (78,440 kg)
			Biofilm Control Agent	172,929 lbs (78,440 kg)
			Sulfuric Acid	3.43 million lbs (1.56 million kg)
			Dechlorinator (Sodium Bisulfite)	86,464 lbs (39,220 kg)
ESWS Water Treatment System (ESWS System)[c]	Normal Operating Conditions and Normal Shutdown/ Cooldown	ESWS Piping ESWS Blowdown/ Retention ~~Basin~~Pond Outlet	Oxidizing Biocide (Sodium Hypochlorite)	17,855 gal (67,581 l)
			Deposit Control Agents (organic phosphonate and acrylate copolymer)	12,411 lbs (5,630 kg)
			Biofilm Control Agent	12,411 lbs (5,630 kg)
			Sulfuric Acid	246,740 lbs (112,154 kg)
			Dechlorinator (Sodium Bisulfite)	6,205 lbs (3,373 kg)
RWSS Water Treatment System[d]	Normal Operating Conditions and Normal Shutdown/ Cooldown	RWSS Makeup/Water Intake RWSS Filters	Oxidizing Biocide (Sodium Hypochlorite)	2,190 gal (8,289 l)
Liquid Waste Storage System and Liquid Waste Processing System[e,f]	Normal Operating Conditions and Normal Shutdown/ Cooldown	Influent Waste Water	Sulfuric Acid Sodium Hydroxide	22,900 gal (86,686 l) 2,400 gal (9,085 l)
Demineralized Water Treatment System[g]	Normal Operating Conditions and Normal Shutdown/ Cooldown	Demineralized Water Distribution System Makeup	Sulfuric Acid Sodium Hydroxide	2,650 gal (10,031 l) 2,400 gal (9,085 l)

Key:
gal - gallons
l - liters
lb - pounds
kg - kilogram

Table 3.3-2— Water Treatment Systems
(Page 2 of 2)

Notes:
a. The Circulating Water System has no safe shutdown or accident mitigation functions. Sodium hypochlorite will typically be added to makeup water. Sodium hypochlorite and dispersant may be added to piping. Chlorine may also be added to piping for prevention of legionella. The estimated quantities of chemical additives are totals used throughout the Circulating Water Treatment System.
b. The estimated dosage rates were calculated as described in Section 3.6.
c. During a Design Basis Accident, the ESWS Water Treatment System is assumed to be non-operational. The estimated quantity of chemical additives is a combined total for the chemicals used in the ESWS.
d. RWSS has no safe shutdown of accident mitigation functions. Sodium hypochlorite will typically be added to makeup water. Sodium hypochlorite and dispersant may be added to piping. The estimated quantity of chemical additives is a combined total for the chemicals used in the RWSS.
e. Types and estimated quantities of chemical additives are based on those used at an existing plant.
f. An anti-foaming agent, complexing agent and/or precipitant may also be used to promote settling of precipitates.
g. The estimated quantities of chemical additives are based on the existing CCNPP Units 1 and 2 Demineralized Water Treatment System which uses the indicated chemicals for the regeneration of condensate demineralizers. The actual quantities of chemical additives will depend on how the demineralizer for BBNPP will be used (i.e., full-flow demineralizers use higher quantities).

Figure 3.3-1— Anticipated Water Use Diagram