**R. R. Sgarro**
Manager-Nuclear Regulatory Affairs

**PPL Bell Bend, LLC**
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8102 FAX 570.802.8119
rrsgarro@pplweb.com

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**BELL BEND NUCLEAR POWER PLANT**
**BBNPP PLOT PLAN CHANGE COLA**
**SUPPLEMENT, PART 3 (ER); SECTION 3.6**
**BNP-2011-026 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 3.6, Revision 2c. The revised BBNPP COLA section supersedes previously submitted information in its entirety.

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NRO

No open RAIs are associated with the enclosed COLA section. The following previously submitted RAI responses were reviewed for impacts:

| RAI No. | Response Impacted? (Yes/No) |
|---|---|
| H 3.6-1 | No |
| H 3.6-2 | No |

These responses to RAIs are not 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 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 3.6, Revision 2c cc: (w/o Enclosures)

Mr. Michael Canova
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Mr. William Dean
Regional Administrator
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Ms. Stacey Imboden
Senior Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dr. Donald Palmrose
Senior Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Enclosure

Revised BBNPP COLA Part 3 (ER), Section 3.6, Revision 2c

## 3.6 NON-RADIOACTIVE WASTE SYSTEMS

This section provides a description of non-radioactive waste systems for BBNPP and the chemical and biocidal characteristics of each non-radioactive waste stream discharged from the unit. The non-radioactive waste streams include: (1) effluents containing chemicals or biocides; (2) sanitary system effluents; and (3) other effluents.

### 3.6.1 Effluents Containing Chemicals or Biocides

Chemicals are typically used to control water quality, scale, corrosion and biological fouling. Sources of non-radioactive effluents include plant blowdown, sanitary wastes, floor and equipment drains, and storm water runoff.

As described in Section 3.3.2, the treatment of non-radioactive effluents will be performed by the Circulating Water Treatment System, the Essential Service Water Treatment System, the Raw Water Supply System (RSWS) Water Treatment System, the Demineralized Water Treat System, and the Liquid Waste Processing System. Table 3.6-1 lists the various chemicals processed through these systems. Chemical concentrations within effluent streams from the plant will be controlled through engineering and operational/administrative controls in order to meet NPDES requirements at the time of construction and operation.

Naturally occurring substances (e.g., aquatic growth) will not be changed in form or concentration by plant operations. These naturally occurring substances will be removed and transferred offsite to a landfill, and not discharged in the effluent stream.

The Susquehanna River will supply cooling and plant makeup water for BBNPP. Table 3.6-3 provides for a list of principal constituents found in the river water. Susquehanna River water quality is discussed in Section 2.3.3.1.2. Estimated chemical parameters in the effluent streams discharging to the Combined Waste Water Retention ~~Basin~~Pond and/or Susquehanna River are shown on Table 3.6-2.

Evaporative cooling systems include the Circulating Water System and the Essential Service Water System (ESWS) (Ultimate Heat Sink). Some of the cooling water associated with these systems is lost through evaporation via their cooling towers as discussed in Section 3.3. During warm weather, when the difference between the air temperature and the water temperature is relatively small, cooling of the water is almost entirely the result of the extraction of heat through evaporation of water to the air. Under extreme winter conditions (e.g., below zero), when the air is much colder than the water, as much as half of the cooling may be the result of sensible heat transfer from the water to the air with the remainder of the cooling being through evaporation. The Circulating Water System and ESWS cooling towers are expected to be operated with at least three three cycles of concentration. Based on Susquehanna River chemistry, three cycles of concentration were conservatively selected for cooling tower operation. Estimated maximum cooling tower blowdown and makeup rates are based on three cycles of concentration. This is consistent with typical cooling tower operation of 3 to 5 cycles of concentration when using surface water makeup. No seasonal variations in cycles of concentration are expected.

Section 3.6.3.2 describes the effluent water chemical concentrations from other sources and the water treatment for general plant use and effluents from the resultant waste stream.

### 3.6.2 Sanitary System Effluents

The purpose of this section is to identify the anticipated volume and type of sanitary waste effluents generated during construction and operation of BBNPP. Sanitary waste systems installed during pre-construction and construction activities will likely include portable toilets supplied and serviced by a licensed sanitary waste treatment contractor. Based on an anticipated construction work force of 1,000 people in the first year of construction activities and 3,000 people in the second through fifth year of construction activities, the quantity of sanitary waste expected to be generated is 6,500 gallons per day (gpd) (24,605 liters per day (lpd)) for the first year, and 19,500 gpd (73,816 lpd) for years two through five, or 4.5 gpm (17.0 lpm) and 13.5 gpm (51.1 lpm), respectively. Sanitary waste will be removed offsite during construction and will not add to existing onsite discharge effluents.

During the Operations phase for BBNPP, a Sanitary Sewer System will be constructed to serve the facility. The Sanitary Sewer System will collect sanitary wastes during the operation of BBNPP. The sanitary wastes (sewage) will be discharged into the municipal sanitary sewer through a lift station that will pump the sewage into a sewer main that is located parallel to U.S. Highway 11. The sewage will be conveyed to a local publicly-owned treatment works operated by the Berwick Area Joint Sewer Authority. The Sanitary Sewer System will be designed for sanitary waste only, and will exclude industrial materials, such as chemical laboratory wastes. The system will be independent of SSES.

The Sanitary Sewer System will be sized to accommodate the needs of personnel associated with this unit.

Discharge of sewage from BBNPP into the municipal sanitary system will be done in accordance with local ordinances and permit requirements. The anticipated discharge limits for sanitary wastewater into the municipal sewer system is provided in Table 3.6-4.

## 3.6.3 Other Effluents

This section describes miscellaneous non-radioactive gaseous, liquid, or solid effluents not addressed in Sections 3.6.1 or 3.6.2.

### 3.6.3.1 Gaseous Effluents

Non-radioactive gaseous effluents result from testing and operating the diesel generators. These effluents commonly include particulates, sulfur oxides, carbon monoxide, hydrocarbons and nitrogen oxides. Gaseous effluent releases will comply with Federal, State, and local emissions standards. Table 1.3-1 lists the environmental-related permits and authorizations for BBNPP.

BBNPP will have six standby diesel generators (four Emergency Diesel Generators (EDGs), and two Station Blackout (SBO) diesel generators). The auxiliary boilers will use electric heating, and do not contribute directly to air emissions.

It is estimated that each EDG will be tested approximately 4 hours every month, plus an additional 24 to 48 hours once every 2 years. It is estimated that each SBO diesel generator will be tested approximately 4 hours every quarter, plus an additional 12 hours every year for maintenance activities. The SBO diesels will also be tested for an extended period of about 12 hours every 18 months.

Diesel generator emissions will be released from an exhaust stack located on top of the diesel generator buildings at an elevation of 78 ft (23.8 m). Pre treatment of diesel generator exhaust will depend on future diesel technology that has yet to be determined. Diesel generator exhaust will meet Environmental Protection Agency (EPA) Tier 4 requirements when BBNPP is operational. Yearly emissions anticipated from the standby diesel generators are provided in Table 3.6-5, and assume a conservative run time for each diesel of 100 hours per year.

### 3.6.3.2 Liquid Effluents

Susquehanna River water will serve as the source of cooling water for the CWS. As described in Section 3.3, Susquehanna River water will also serve as the source of cooling water for the ESWS and for power plant makeup water. Under normal operating conditions, the RWSS will supply the ESWS and power plant with makeup water. Municipal water provided from Pennsylvania American Water (PAW) will serve as the source of water for potable and sanitary purposes and miscellaneous plant systems.

Circulating Water Makeup System Pumps (CWSMWS) will supply the CWS with water from the Susquehanna River. The CWSMWS intake structure will be located on the west bank of the Susquehanna River and will house the CWS and RWSS makeup pumps. The intake structure will be protected by a bar grating and curtain walls to prevent floating debris from approaching the pumps. The bar grating will be cleared by trash rakes. The intake structure will be equipped with traveling screens to remove debris from the intake water. Trash basins will be installed to collect the debris. The CWSMWS will convey river water into a closed cooling system, which will utilize two natural draft cooling towers to remove heat from the water after it has passed through the plant's steam condenser. Evaporation in the CWS cooling towers increases the level of solids in the circulating water. To control solids, a portion of the recirculated water will be removed through the CWS blowdown and replaced with water through the CWSMWS.

The RWSS will supply water from the Susquehanna River to the Demineralized Water Distribution System (DWDS), Fire Water Distribution System (FWDS), ESWS, and the ESW Emergency Makeup System Retention Pond. The RWSS pumps located in the intake structure will pump water from the Susquehanna River to the plant. An automatic self-cleaning strainer will be located at the discharge of each raw RWSS pump to remove particulate matter prior to conveyance to the Water Treatment Building (WTB). Backwash water from the strainers will be returned to the river. Media filters located in the WTB will remove suspended solids from the raw water before it is distributed for use. The media filters will be backwashed to remove the collected solids and the backwash water will be discharged to the Combined Waste Water Retention ~~Basin.~~Pond.

In addition to supplying the power plant with makeup water, the RWSS will convey Susquehanna River water to the ESWS, which will feature four, closed cooling systems. Each system will utilize an ESWS cooling tower to dissipate heat from the ESWS. A portion of the ESWS water flow will be constantly blown back down to the Combined Waste Water Retention ~~Basin~~Pond to control solids build-up in the ESWS.

Because of evaporative water losses in the cooling towers, the concentration of constituents in the raw river water influent to the cooling towers will increase, increasing the concentration of these constituents in the blowdown that will be discharged to the Combined Waste Water Retention ~~Basin,~~Pond, where it will be mixed with other wastewater discharges. Refer to Table 3.6-6 and Table 3.6-7 for the estimated blowdown discharge concentrations in the effluent from the cooling tower systems, based on three cycles of concentration, as discussed in Section 3.6.1. The effluent from the cooling tower systems will also contain residual treatment chemicals used to prevent fouling and scaling. The estimated concentrations of these residual chemicals, based on vendor recommended treatment concentrations and three cycles of concentration are shown on Table 3.6-2 .

A portion of the power plant makeup water will be treated to supply the DWDS, which is used to produce pure water for various systems in the power plant. Constituents found in the raw feed water to the DWDS will be concentrated in the reject water from the DWDS reverse osmosis (RO) unit. The RO reject water will be discharged to the Combined Waste Water Retention ~~Basin.~~Pond. The estimated concentrations of constituents in the RO reject water, based on the reject rate, are shown on Table 3.6-8.

The cooling water blowdown from the CWS and ESWS, along with other plant flows (DWDS RO reject water, RWSS filter backwash, and miscellaneous low volume waste) as shown in Table 3.3-1, will be directed into the ~~common~~Combined Waste Water Retention ~~Basin~~Pond to allow for settling of suspended solids and further chemical treatment, if necessary. Water in the Combined Waste Water Retention ~~Basin~~Pond will drain by gravity to the Susquehanna River for discharge through an offshore diffuser.

Non-radioactive liquid effluents that could potentially drain to the Susquehanna River will be limited under a NPDES wastewater discharge permit. There are three anticipated regulated outfalls for release of non-radioactive liquid effluents from BBNPP: one outfall for the gravity-drained discharge from the Combined Waste Water Retention ~~Basin~~Pond for plant effluents (e.g., cooling tower blowdown, effluent from RWSS water treatment, reject water from the DWDS, and miscellaneous low volume flows) via the offshore submerged diffuser; one outfall for stormwater via various surface outlets through the BBNPP site, and one outfall for intake screen backwash and RWSS pump strainer discharge.

Stormwater at BBNPP will be collected through a network of storm sewers and swales and drained to ~~two stormwater detention ponds that~~ infiltration beds which will ~~allow for the settling of~~ be located to maintain post-construction hydrological conditions as close to preconstruction conditions as possible. Infiltration beds will also help maintain surface water temperatures. A temporary pond may be installed to manage runoff and suspended solids ~~and~~from the ~~retention of peak flow volumes.~~ concrete batch plant and aggregate material storage areas. Contaminants potentially present in the stormwater discharge from BBNPP are anticipated to be similar to those currently found in stormwater from SSES. SSES has been required to monitor stormwater discharges in the past for Total Suspended Solids (TSS), nitrate, oil and grease (O&G), biochemical oxygen demand (BOD), chemical oxygen demand (COD), pH, and total Kjeldahl nitrogen (TKN).

Discharge from the outfalls at BBNPP will be controlled under the BBNPP NPDES permit. Estimated BBNPP effluent water chemical concentrations are presented in Table 3.6-9.

Other non-radioactive liquid waste effluents from plant sources (i.e., Steam Generator Blowdown Demineralizing System) are managed and processed by the Liquid Waste Storage System and the Liquid Waste Processing System. These systems also manage and process radioactive liquid wastes. BBNPP non-radioactive liquid waste effluents will not be directly discharged. Non-radioactive liquid waste is first stored in a tank where it is pre-treated chemically or biologically. Chemical pre-treatment gives the waste an optimum pH value; biological pre-treatment allows organics to be consumed. If deemed cleaned, it can be routed directly to one of the monitoring tanks; otherwise, once pre-treated, the wastes are forwarded to the Liquid Waste Processing System for treatment. Treatment may consist of evaporation, centrifugation, demineralization/filtration, chemical precipitation (in connection with centrifugation), or organic decomposition (in connection with centrifugation). After the waste water has been treated, it is received in one of two monitoring tanks, which also receive treated liquid radwaste. Waste water is then sampled and analyzed and if within the limits for discharge, it can be released.

Miscellaneous low-volume wastewater includes non-radioactive floor drain and equipment discharges and other intermittent wastewater flows. Miscellaneous low-volume wastewater will not undergo separate treatment, but will be discharged into the ~~Wastewater~~ Combined Waste Water Retention ~~Basin~~Pond where it will be combined with other wastewater flows, be sampled and treated as necessary.

### 3.6.3.3 Hazardous Wastes

Hazardous wastes are materials with properties that make them dangerous or potentially harmful to human health or the environment, or that exhibit at least one of the following characteristics: ignitability, corrosivity, reactivity or toxicity. Federal Resource Conservation and Recovery Act regulations govern the generation, treatment, storage and disposal of hazardous wastes. Hazardous waste is defined as any solid, liquid or gaseous waste that is not mixed waste, is listed as hazardous by any federal or state regulatory agency or meets the criteria of Subpart D of 40 CFR 261 (CFR, 2007) Code of Pennsylvania Regulation Title 25 Pennsylvania Code Section 261a (PA, 2008e).

A Hazardous Waste Minimization Plan will be developed and maintained that documents the current and planned efforts to reduce the amount or toxicity of the hazardous waste to be generated at BBNPP. Hazardous wastes will be collected and stored in a controlled access temporary storage area (TSA). A Hazardous Material and Oil Spill Response guideline will be maintained that defines HAZMAT team positions and duties. Procedures will be put in place to minimize the impact of any hazardous waste spills in the unlikely event of a spill. Containers of known hazardous waste received at a TSA will be transported offsite within 90 days of the containers accumulation date according to the applicable section/unit procedures. The Radiation Protection and Chemistry Manager will be responsible for coordinating the activities of waste transport disposal vendors or contractors while they are on site, ensuring that the transporter has an EPA identification number.

Table 3.6-10 lists the types and quantities of hazardous waste generated at SSES. The table is based on the SSES biennial hazardous waste reports submitted to the DEP for the years 2003, 2005 and 2007. The quantity of hazardous wastes generated at BBNPP is expected to be similar to or less than that at SSES.

If waste is not hazardous, such as garbage, refuse, discarded material or other waste, including solid, liquid, semisolid or contained gaseous materials resulting from industrial operations, it is regulated as Residual Waste in Pennsylvania. Generators of Residual Waste are required to develop a source reduction strategy and to maintain records of the types and amounts of Residual Waste generated, dates that wastes were shipped offsite or processed onsite, information on the transporters used to transport the waste offsite, and information on the processing, disposal facility or other location to which the waste was transported. (PA, 2008d)

BBNPP will develop a source reduction strategy and perform chemical analyses for Residual Waste streams generated at BBNPP. BBNPP will maintain the required records for Residual Waste generation, processing, transportation and disposal. Residual Wastes that will be generated by BBNPP are expected to be similar in nature and quantity to that of SSES. Table 3.6-11 presents a summary of Residual Wastes generated at SSES and the annual quantities shipped.

#### 3.6.3.4 Mixed Wastes

Mixed waste includes hazardous waste that is intermixed with a low level radioactive source, special nuclear material, or byproduct material. Federal regulations governing generation, management, handling, storage, treatment, disposal, and protection requirements associated with these wastes are contained in 10 CFR (NRC regulations) and 40 CFR (Environmental Protection Agency regulations). Mixed waste is generated during routine maintenance activities, refueling outages, radiation and health protection activities and radiochemical laboratory practices. Section 5.5.2 discusses mixed waste impacts, including quantities of mixed waste generated. The quantity of mixed waste generated at BBNPP is expected to be small, as it is at other nuclear power plants.

Similar to SSES, the management of mixed waste at BBNPP will comply with the requirements of EPA's Mixed Waste Enforcement Policy and the Commonwealth of Pennsylvania Regulations (PA, 2008c) (USEPA, 1991). The existing plant currently ships mixed waste offsite to a permitted facility. This occurs infrequently, and is dependent on the waste matrix. Mixed waste streams include laboratory chemicals, lead paint debris, solvent-contaminated rags, lead penetration barrier debris, and waste phosphoric acid. It is expected that BBNPP will also infrequently ship some mixed waste to permitted facilities. Mixed wastes stored in the storage area will be inventoried and a list will be maintained according to BBNPP procedures, and weekly inspections of mixed waste will be conducted according to these same procedures.

#### 3.6.3.5 Solid Effluents

Construction of BBNPP will involve the generation of construction debris, including earthen material such as clays, sands, gravels and silts; topsoil; tree stumps; root mats; brush and limbs; logs; vegetation; and rock. Construction debris will be managed in accordance with Pennsylvania regulations pertaining to solid waste.

Waste materials such as office paper, cardboard and aluminum cans will be recycled locally. Putrescible wastes will be disposed in a permitted offsite disposal facility.

The types of solid effluents that would be expected to be generated by the new unit include hazardous waste, mixed wastes, residual waste, construction and demolition (C&D) waste, metal and wood for recycle, and cooling waste intake debris. Hazardous waste and mixed waste generation are discussed in the preceding sections.

Disposal, recycling and recovery of solid wastes are described in Section 5.5.1. In summary:

- Non radioactive solid wastes (e.g., office waste, recyclables) are collected temporarily on the BBNPP site and disposed of at offsite, licensed disposal and recycling facilities.
- Debris (e.g., vegetation) collected on trash racks and screens at the water intake structure are disposed of as solid waste in accordance with the applicable NPDES permit.
- Scrap metal, used oil, antifreeze (ethylene or propylene glycol), and universal waste will be collected and stored temporarily on the BBNPP site and recycled or recovered at an offsite permitted recycling or recovery facility, as appropriate. Waste oil and antifreeze are not hazardous wastes in Pennsylvania (PA, 2008a) (PA, 2008b). Typically, used oil and antifreeze are recycled. If they are not recyclable or recoverable, they will be disposed of as a solid waste or hazardous waste in accordance with the applicable regulations.

### 3.6.4 References

**CFR, 2007.** Title 40, Code of Federal Regulations, Part 261, Identification and Listing of Hazardous Waste, 2007.

**NRC, 1996.** NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Nuclear Regulatory Commission, May 1996.

**PA, 2008a.** Title 25, Pennsylvania Code, Section 298, Management of Waste Oil.

**PA, 2008b.** Title 25, Pennsylvania Code, Article VII, Hazardous Waste Management.

**PA, 2008c.** Title 25, Pennsylvania Code, Article V, Radiological Health.

**PA, 2008d.** Title 25, Pennsylvania Code, Section 287, Residual Waste Management.

**PA, 2008e.** Title 25, Pennsylvania Code, Section 261a, Identification and Listing of Hazardous Waste.

**USEPA, 1991.** Volume 56, Federal Register, 42730-42734, U.S. EPA's 1991 Mixed Waste Enforcement Policy, August 29, 1991.

## Table 3.6-1— Chemicals Used in Water Treatment Systems

(Page 1 of 2)

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

## Table 3.6-1— Chemicals Used in Water Treatment Systems

(Page 2 of 2)

| Water Treatment System | Operating Cycle(s) | Points of Addition | Chemical Processed | Estimated Total Amount Used per Year | Frequency Of Use |
|---|---|---|---|---|---|

Key:
gal - gallons
l - liters
kg - kilograms
lbs - pounds
CWS - Circulating Water System
ESWS - Essential Service Water System

Notes:

a. The estimated dosage rates were calculated from vendor recommended values.

b. The concentration of sulfuric acid injected to control scale and adjust pH is 33 mg/l.

c. The estimated dosage rates are calculated.

d. Types and estimated quantities of chemical additives are based on those used at an existing plant.

e. An anti-foaming agent, complexing agent and/or precipitant may also be used to promote settling of precipitates.

f. 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).

g. Sodium bisulfite (dechlorination chemical) will be added to Combined Waste Water Retention ~~Basin~~Pond discharge.

**Table 3.6-2— Estimated Concentrations of Chemical Additives and Byproducts in Water Treatment System Discharges**

(Page 1 of 2)

| System | Discharge Flow gpm (lpm) | Chemical Treatment | Chemical Additive | Additive Concentration | Additive Byproduct Concentration [d] | Anticipated Discharge Limits [e] |
|---|---|---|---|---|---|---|
| CWS Blowdown | 7,928 (30,007) | Oxidizing Biocide | Sodium Hypochlorite | 16.2 mg/l [a] | FAC - 0.5 mg/l [c]<br>Sodium - 5.0 mg/l<br>Chloride - 7.7 mg/l<br>TDS - 12.7 mg/l | FAC - 0.2 mg/l daily max<br>pH 6.0 - 9.0 |
| | | Deposit Control Agent | HEDP [b] | 5 mg/l [a] | TDS - 5 mg/l | |
| | | Biofilm Control Agent | Spectrus BD1500® | 5 mg/l [a] | TDS - 5 mg/l | |
| | | Dechlorinator [f] | Sodium Bisulfite | 2.5 mg/l [a] | Sodium - 0.55 mg/l<br>Sulfate - 2.3 mg/l<br>TDS 2.85 mg/l | |
| | | pH Adjust | Sulfuric Acid | 33 mg/l [b] | Sulfate - 96 mg/l<br>TDS - 96 mg/l | |
| ESWS Blowdown | 569 (2,154) | Oxidizing Biocide | Sodium Hypochlorite | 16.2 mg/l [a] | FAC - 0.5 mg/l [c]<br>Sodium - 5.0 mg/l<br>Chloride 7.7 mg/l<br>TDS - 12.7 mg/l | FAC - 0.2 mg/l daily max<br>pH 6.0 - 9.0 |
| | | Deposit Control Agent | HEDP [b] | 5 mg/l [a] | TDS - 5 mg/l | |
| | | Biofilm Control Agent | Spectrus BD1500® | 5 mg/l [a] | TDS - 5 mg/l | |
| | | Dechlorinator f | Sodium Bisulfite | 2.5 mg/l [a] | Sodium - 0.55 mg/l<br>Sufate - 2.3 mg/l<br>TDS - 2.85 mg/l | |
| | | pH Adjust / Alkalinity Control | Sulfuric Acid | 33 mg/l [b] | Sulfate - 96 mg/l<br>TDS - 96 mg/l[d] | |
| RWSS Filter Backwash | 91 (344) | Oxidizing Biocide | Sodium Hypochlorite | 5.4 mg/l [h] | FAC - 0.5 mg/l [b]<br>Sodium - 1.7 mg/l<br>Chloride - 2.6 mg/l<br>TDS - 4.3 mg/l | FAC - 0.2 mg/l daily max<br>pH 6.0 - 9.0<br>TSS [g] - 100 mg/l max |
| Liquid Waste Storage System and Liquid Waste Processing System Discharge | 11 (42) | Neutralization | Sulfuric Acid | Not Applicable | Sufate - 8.8 mg/l [i]<br>Sodium - 0.5 mg/l [i]<br>TDS - 9.3 mg/l [i] | pH 6.0 - 9.0<br>TSS - 100 mg/l max<br>O&G - 20 mg/l max |
| | 11 (42) | Neutralization | Sodium Hydroxide | Not Applicable | | |

## Table 3.6-2— Estimated Concentrations of Chemical Additives and Byproducts in Water Treatment System Discharges

(Page 2 of 2)

| System | Discharge Flow gpm (lpm) | Chemical Treatment | Chemical Additive | Additive Concentration | Additive Byproduct Concentration [d] | Anticipated Discharge Limits [e] |
|---|---|---|---|---|---|---|
| Demineralized Water Treatment System Discharge | 27 (102) | Ion exchange Regeneration and Neutralization | Sulfuric Acid | Not Applicable | Sufate - 1.0 mg/l<br>[i]Sodium - 0.5 mg/l [i]<br>TDS - 1.5 mg/l [i] | pH 6.0 - 9.0<br>TSS - 100 mg/l max<br>O&G - 20 mg/l max |
| | 27 (102) | Ion Exchange Regeneration and Neutralization | Sodium Hydroxide | Not Applicable | | |

Key:
mg/l - milligrams per liter
FAC - Free Available Chlorine
O&G - Oil & Grease
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
HEDP - Bis-(1-hydroxyethylidine) Phosphonic Acid

Notes:

a. Circulating water concentrations based on vendor recommendations. The concentration of sodium hypochlorite was calculated from the recommended dosage of 1,500 gallons of a 15% sodium hypochlorite solution.
b. A cooling water makeup concentration of 33 mg/L of sulfuric acid is recommended to control scale and adjust pH. HEDP is recommended as a deposit control agent
c. FAC concentrations based on assumptions in vendor letter.
d. Concentrations based on 3 cycles of concentration.
e. Based on existing NPDES Permit for SSES
f. Sodium bisulfite (dechlorination chemical) will be added to Combined Waste Water Retention ~~Basin~~Pond discharge.
g. TSS limits would apply at Combined Waste Water Retention ~~Basin~~Pond Outfall.
h. The estimated concentration is calculated
i. As measured in discharge from Combined Waste Water Retention ~~Basin.~~Pond.

## Table 3.6-3— Intake Source Water Quality [a, b]

| Parameter | Units | Maximum | Mean |
|---|---|---|---|
| Total Alkalinity | mg/l | 94.0 | 59.8 |
| Total Suspended Solids | mg/l | 152.0 | 29.7 |
| Silica (Silicon Dioxide) | mg/l | 4.7 | 2.8 |
| Bicarbonate as $CaCO_3$ | mg/l | 94.0 | 63.0 |
| Chloride | mg/l | 38.2 | 25.4 |
| Fluoride | mg/l | 0.1 | 0.1 |
| Nitrate as $NO_3$ | mg/l | 3.4 | 2.1 |
| Nitrate as N | mg/l | 0.8 | 0.5 |
| Phosphorus as $PO_4$ | mg/l | 0.736 | 0.2 |
| Sulfate | mg/l | 48.8 | 26.2 |
| Aluminum, Total | µg/l | 2,740 | 458.5 |
| Barium, Total | µg/l | 58.0 | 32.8 |
| Calcium, Total | mg/l | 38.5 | 26.3 |
| Iron, Total | mg/l | 5.9 | 1.3 |
| Magnesium, Total | mg/l | 10.0 | 6.2 |
| Manganese, Total | µg/l | 257.0 | 136.3 |
| Potassium, Total | mg/l | 2.2 | 1.6 |
| Sodium, Total | mg/l | 22.7 | 12.0 |
| Strontium, Total | µg/l | 167.0 | 101.1 |
| Zinc, Total | µg/l | 26.0 | 15.3 |
| Arsenic, Total | µg/l | 2.9 | 0.9 |
| Lead, Total | µg/l | 5.0 | 5.0 |
| TDS | mg/l | 195.7 | 141.6 |
| Calcium Hardness | mg/l | 96.1 | 65.8 |
| Total Hardness | mg/l | 131.0 | 91.2 |

Key:
mg/l - milligrams per liter
µg/l - micrograms per liter
Notes:
a. The source of cooling and plant makeup water is the Susquehanna River
b. River water quality taken from laboratory results of quarterly sampling of river water at the SSES intake location in 2006 and 2007.

## Table 3.6-4— Sanitary Sewer Discharge Limits

| Parameter | Maximum Discharge Limit [a] (mg/l) |
|---|---|
| Biochemical Oxygen Demand (BOD) | 300 |
| Total Suspended Solids (TSS) | 350 |
| Arsenic | 0.08 |
| Cadmium | 0.005 |
| Chromium | 5.4 |
| Copper | 1.2 |
| Cyanide | 0.5 |
| Lead | 0.3 |
| Mercury | 0.03 |
| Molybdenum | 0.6 |
| Nickel | 0.7 |
| Phenol | 10.0 |
| Selenium | 0.2 |
| Silver | 1.3 |
| Zinc | 0.9 |
| pH | 6.0 - 10.5 |
| Temperature | 32-104 °F (0-40°C) |

Key: mg/l - milligrams per liter
Notes:
a. Limits apply to wastewater discharges to the Berwick Area Joint Sewer Authority.

## Table 3.6-5— Non-Radioactive Gaseous Effluents

| EPA Tier Emission Data | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Emission Source** | **Engine Power (Kw)** | **Emission (g/Kw-hr)** | **NOx** | **PM** | **CO** | **SOx (Note 6)** | |
| | | | | | | | |
| **EDG** | 10130 (Note 1) | | 1.60 | 0.15 | N/A | N/A | (Note 3) |
| | | | | | | | |
| **SBO diesel** | 5000 (Note 2) | (Note 4) | 9.80 | 0.50 | 5.00 | N/A | (Note 4) |
| | **Number of Hours per Year Each Generator is Operated = 100** | | | | | | (Note 5) |
| | | | | | | | |
| **per EDG** | | **Lb/hr** | 35.73 | 3.35 | N/A | 2.63 | |
| | | **Lb/yr** | 3,573.19 | 334.99 | N/A | 262.93 | |
| | | **Tpy** | 1.79 | 0.17 | N/A | 0.13 | |
| | | | | | | | |
| **per SBO** | | **Lb/hr** | 108.02 | 5.51 | 55.11 | 0.04 | |
| | | **lb/yr** | 10,802.47 | 551.15 | 5,511.46 | 4.16 | |
| | | **Tpy** | 5.40 | 0.28 | 2.76 | 0.00 | |
| | | | | | | | |
| **Total (4xEDG)** | | **Lbs/yr** | 14,293 | 1,340 | N/A | 1,052 | |
| | | **Tpy** | 7.15 | 0.67 | N/A | 0.53 | |
| **(2xSBO)** | | **Lbs/yr** | 21,605 | 1,102 | 11,023 | 8.31 | |
| | | **Tpy** | 10.80 | 0.55 | 5.51 | 0.00 | |
| **(4xEDG+2xSBO)** | | **Lbs/yr** | 35,898 | 2,442 | 11,023 | 1,060 | |
| | | **Tpy** | 17.95 | 1.22 | 5.51 | 0.53 | |

Key:
N/A = Not Applicable
EDG=Emergency Diesel Generator
SBO = Station Blackout Generator
Note 1: 10,130 kW
Note 2: 5,000 kW
Note 3: Emission limits per FR Vol. 71, No. 132 dated 07/11/2006, page 39158 Section II.D.3.b and 40 CFR 60.4205(d)
Note 4: Emission limits per FR Vol. 71, No. 132 dated 07/11/2006, page 39157 Table 3, page 39174, and 40 CFR 60.4202
Note 5: Limit of hours of operation (testing) per 40 CFR 60.4211(e)
Note 6: No monitoring or limits for SOx is envisioned due to the planned use of low-sulfur fuel. FR Vol. 71, No. 132 dated 07/11/2006 page 39158 Section II.D.5

## Table 3.6-6— Anticipated CWS Blowdown Concentrations

| Parameter | Units | River Intake Water Parameter | | CWS Blowdown Discharge Rate gpm (lpm) | CWS Blowdown Conc. Max [a] | CWS Blowdown Conc. Mean [a] |
|---|---|---|---|---|---|---|
| | | Conc. Max | Conc. Mean | | | |
| Total Alkalinity | mg/l | 94.0 | 59.8 | 7,928 (30,007) | 181 | 78.4 |
| Total Suspended Solids | mg/l | 152.0 | 29.7 | 7,928 (30,007) | 456 | 89.1 |
| Silica (Silicon Dioxide) | mg/l | 4.7 | 2.8 | 7,928 (30,007) | 14.1 | 8.4 |
| Bicarbonate as $CaCO_3$ | mg/l | 94.0 | 63.0 | 7,928 (30,007) | 282 | 189 |
| Chloride | mg/l | 38.2 | 25.4 | 7,928 (30,007) | 122.3 | 83.9 |
| Fluoride | mg/l | 0.1 | 0.1 | 7,928 (30,007) | 0.3 | 0.3 |
| Nitrate as $NO_3$ | mg/l | 3.4 | 2.1 | 7,928 (30,007) | 10.2 | 6.3 |
| Nitrate as N | mg/l | 0.8 | 0.5 | 7,928 (30,007) | 2.4 | 1.5 |
| Phosphorus as $PO_4$ | mg/l | 0.736 | 0.2 | 7,928 (30,007) | 2.4 | 0.8 |
| Sulfate | mg/l | 48.8 | 26.2 | 7,928 (30,007) | 242.4 | 174.6 |
| Aluminum, Total | µg/l | 2,740 | 458.5 | 7,928 (30,007) | 8,220 | 1375.5 |
| Barium, Total | µg/l | 58.0 | 32.8 | 7,928 (30,007) | 174 | 98.4 |
| Calcium, Total | mg/l | 38.5 | 26.3 | 7,928 (30,007) | 115.5 | 78.9 |
| Iron, Total | mg/l | 5.9 | 1.3 | 7,928 (30,007) | 17.7 | 3.9 |
| Magnesium, Total | mg/l | 10.0 | 6.2 | 7,928 (30,007) | 30 | 18.6 |
| Manganese, Total | µg/l | 257.0 | 136.3 | 7,928 (30,007) | 771 | 408.9 |
| Potassium, Total | mg/l | 2.2 | 1.6 | 7,928 (30,007) | 6.6 | 4.8 |
| Sodium, Total | mg/l | 22.7 | 12.0 | 7,928 (30,007) | 73.1 | 41 |
| Strontium, Total | µg/l | 167.0 | 101.1 | 7,928 (30,007) | 501 | 303 |
| Zinc, Total | µg/l | 26.0 | 15.3 | 7,928 (30,007) | 78 | 45.9 |
| Arsenic, Total | µg/l | 2.9 | 0.9 | 7,928 (30,007) | 8.7 | 2.7 |
| Lead, Total | µg/l | 5.0 | 5.0 | 7,928 (30,007) | 15 | 15 |
| TDS | mg/l | 195.7 | 141.6 | 7,928 (30,007) | 706 | 424.8 |
| Calcium Hardness | mg/l | 96.1 | 65.8 | 7,928 (30,007) | 288.3 | 197.4 |
| Total Hardness | mg/l | 131.0 | 91.2 | 7,928 (30,007) | 393 | 273.6 |
| HEDP | mg/l | 0 | 0 | 7,928 (30,007) | 5 | 5 |
| Dispersant | mg/l | 0 | 0 | 7,928 (30,007) | 5 | 5 |
| Free Available Chlorine | mg/l | 0 | 0 | 7,928 (30,007) | < 0.5 | < 0.5 |

Key:
- mg/l - milligrams per liter
- µg/l - micrograms per liter
- gpm- gallons per minute
- ~~l pm~~ lpm - liters per minute

Notes:
a. Concentrations are based on 3 cycles of concentration

## Table 3.6-7— Anticipated ESWS Blowdown Concentrations

| Parameter | Units | River Intake Water Parameter | | ESWS Blowdown Discharge Rate gpm (lpm) | ESWS Blowdown Conc. Max [a] | ESWS Blowdown Conc. Mean [a] |
|---|---|---|---|---|---|---|
| | | Conc. Max | Conc. Mean | | | |
| Total Alkalinity | mg/l | 94.0 | 59.8 | 569 (2,154) | 181 | 78.4 |
| Total Suspended Solids | mg/l | 152.0 | 29.7 | 569 (2,154) | 45.6 | 8.91 |
| Silica (Silicon Dioxide) | mg/l | 4.7 | 2.8 | 569 (2,154) | 14.1 | 8.4 |
| Bicarbonate as $CaCO_3$ | mg/l | 94.0 | 63.0 | 569 (2,154) | 282 | 189 |
| Chloride | mg/l | 38.2 | 25.4 | 569 (2,154) | 122.3 | 83.9 |
| Fluoride | mg/l | 0.1 | 0.1 | 569 (2,154) | 0.3 | 0.3 |
| Nitrate as $NO_3$ | mg/l | 3.4 | 2.1 | 569 (2,154) | 10.2 | 6.3 |
| Nitrate as N | mg/l | 0.8 | 0.5 | 569 (2,154) | 2.4 | 1.5 |
| Phosphorus as $PO_4$ | mg/l | 0.736 | 0.2 | 569 (2,154) | 2.4 | 0.8 |
| Sulfate | mg/l | 48.8 | 26.2 | 569 (2,154) | 242.4 | 174.6 |
| Aluminum, Total | µg/l | 2,740 | 458.5 | 569 (2,154) | 8,220 | 1375.5 |
| Barium, Total | µg/l | 58.0 | 32.8 | 569 (2,154) | 174 | 98.4 |
| Calcium, Total | mg/l | 38.5 | 26.3 | 569 (2,154) | 115.5 | 78.9 |
| Iron, Total | mg/l | 5.9 | 1.3 | 569 (2,154) | 17.7 | 3.9 |
| Magnesium, Total | mg/l | 10.0 | 6.2 | 569 (2,154) | 30 | 18.6 |
| Manganese, Total | µg/l | 257.0 | 136.3 | 569 (2,154) | 771 | 408.9 |
| Potassium, Total | mg/l | 2.2 | 1.6 | 569 (2,154) | 6.6 | 4.8 |
| Sodium, Total | mg/l | 22.7 | 12.0 | 569 (2,154) | 73.1 | 41 |
| Strontium, Total | µg/l | 167.0 | 101.1 | 569 (2,154) | 501 | 303 |
| Zinc, Total | µg/l | 26.0 | 15.3 | 569 (2,154) | 78 | 45.9 |
| Arsenic, Total | µg/l | 2.9 | 0.9 | 569 (2,154) | 8.7 | 2.7 |
| Lead, Total | µg/l | 5.0 | 5.0 | 569 (2,154) | 15 | 15 |
| TDS | mg/l | 195.7 | 141.6 | 569 (2,154) | 706 | 424.8 |
| Calcium Hardness | mg/l | 96.1 | 65.8 | 569 (2,154) | 288.3 | 197.4 |
| Total Hardness | mg/l | 131.0 | 91.2 | 569 (2,154) | 393 | 273.6 |
| HEDP | mg/l | 0 | 0 | 569 (2,154) | 5 | 5 |
| Dispersant | mg/l | 0 | 0 | 569 (2,154) | 5 | 5 |
| Free Available Chlorine | mg/l | 0 | 0 | 569 (2,154) | < 0.5 | < 0.5 |

Key:

mg/l - milligrams per liter
µg/l - micrograms per liter
gpm- gallons per minute
lpm - liters per minute

Notes:

a. Concentrations are based on 3 cycles of concentration

## Table 3.6-8— Anticipated Reverse Osmosis Reject Concentrations

| Parameter | Units | River Intake Water Parameter | | RO Reject Discharge Rate gpm (lpm) | RO Reject Conc. Max [a, b] | RO Reject Conc. Mean [a, b] |
|---|---|---|---|---|---|---|
| | | Conc. Max | Conc. Mean | | | |
| Total Alkalinity | mg/l | 94.0 | 59.8 | 27 (102) | 373 | 237 |
| Total Suspended Solids | mg/l | 152.0 | 29.7 | 27 (102) | 60.2 | 11.8 |
| Silica (Silicon Dioxide) | mg/l | 4.7 | 2.8 | 27 (102) | 19 | 11 |
| Bicarbonate as $CaCO_3$ | mg/l | 94.0 | 63.0 | 27 (102) | 373 | 250 |
| Chloride | mg/l | 38.2 | 25.4 | 27 (102) | 162 | 111 |
| Fluoride | mg/l | 0.1 | 0.1 | 27 (102) | 0.4 | 0.4 |
| Nitrate as $NO_3$ | mg/l | 3.4 | 2.1 | 27 (102) | 13.5 | 8.3 |
| Nitrate as N | mg/l | 0.8 | 0.5 | 27 (102) | 3.2 | 2.0 |
| Phosphorus as $PO_4$ | mg/l | 0.736 | 0.2 | 27 (102) | 2.9 | 0.8 |
| Sulfate | mg/l | 48.8 | 26.2 | 27 (102) | 193 | 104 |
| Aluminum, Total | µg/l | 2,740 | 458.5 | 27 (102) | 10,858 | 1,817 |
| Barium, Total | µg/l | 58.0 | 32.8 | 27 (102) | 230 | 130 |
| Calcium, Total | mg/l | 38.5 | 26.3 | 27 (102) | 153 | 104 |
| Iron, Total | mg/l | 5.9 | 1.3 | 27 (102) | 23.4 | 5.2 |
| Magnesium, Total | µg/l | 10.0 | 6.2 | 27 (102) | 39.6 | 24.6 |
| Manganese, Total | mg/l | 257.0 | 136.3 | 27 (102) | 1,018 | 540.1 |
| Potassium, Total | mg/l | 2.2 | 1.6 | 27 (102) | 8.7 | 6.3 |
| Sodium, Total | mg/l | 22.7 | 12.0 | 27 (102) | 96.7 | 54.3 |
| Strontium, Total | µg/l | 167.0 | 101.1 | 27 (102) | 661.8 | 400.3 |
| Zinc, Total | µg/l | 26.0 | 15.3 | 27 (102) | 103 | 61 |
| Arsenic, Total | µg/l | 2.9 | 0.9 | 27 (102) | 11.5 | 3.6 |
| Lead, Total | µg/l | 5.0 | 5.0 | 27 (102) | 19.8 | 19.8 |
| TDS | mg/l | 195.7 | 141.6 | 27 (102) | 792.6 | 578.2 |
| Calcium Hardness | mg/l | 96.1 | 65.8 | 27 (102) | 380.8 | 260.8 |
| Total Hardness | mg/l | 131.0 | 91.2 | 27 (102) | 519.1 | 361.4 |

Key:

mg/l - milligrams per liter
µg/l - micrograms per liter
gpm- gallons per minute
lpm - liters per minute

Notes:

a. Makeup to Demineralized Water Treatment System is filtered river water from RWSS.

b. Reverse Osmosis (RO) reject concentrations calculated by multiplying filtered river water makeup concentrations by a ratio of 107:27 (based on the reverse osmosis (RO) reject rate)

## Table 3.6-9— Anticipated Effluent Water Chemical Concentrations

(Page 1 of 2)

| Outfall: Plant Effluent to Susquehanna River via Submerged Diffuser [a, b] | | | |
|---|---|---|---|
| **Parameter** | **Units** | **Maximum Concentration** | **Mean Concentration** |
| Total Alkalinity | mg/l | 180 | 78 |
| Total Suspended Solids | mg/l | 447 | 87 |
| Silica (Silicon Dioxide) | mg/l | 14 | 8 |
| Bicarbonate as $CaCO_3$ | mg/l | 279 | 187 |
| Chloride | mg/l | 121 | 83 |
| Fluoride | mg/l | 0.3 | 0.3 |
| Nitrate as $NO_3$ | mg/l | 10 | 6 |
| Nitrate as N | mg/l | 2 | 1 |
| Phosphorus as $PO_4$ | mg/l | 2 | 1 |
| Sulfate | mg/l | 253 | 186 |
| Aluminum, Total | µg/l | 8,123 | 1,359 |
| Barium, Total | µg/l | 172 | 97 |
| Calcium, Total | mg/l | 114 | 78 |
| Iron, Total | mg/l | 17 | 4 |
| Magnesium, Total | mg/l | 30 | 18 |
| Manganese, Total | µg/l | 762 | 331 |
| Potassium, Total | mg/l | 7 | 5 |
| Sodium, Total | mg/l | 74 | 43 |
| Strontium, Total | µg/l | 495 | 299 |
| Zinc, Total | µg/l | 77 | 45 |
| Arsenic, Total | µg/l | 9 | 3 |
| Lead, Total | µg/l | 15 | 15 |
| Total Dissolved Solids | mg/l | 713 | 553 |
| Calcium Hardness | mg/l | 285 | 195 |
| Total Hardness | mg/l | 388 | 270 |
| HEDP | mg/l | 5 | 5 |
| Dispersant | mg/l | 5 | 5 |
| Free Available Chlorine | mg/l | < 0.2 | < 0.2 |

## Table 3.6-9— Anticipated Effluent Water Chemical Concentrations

(Page 2 of 2)

| Outfall: ~~Effluent from~~ Storm Water ~~Detention Ponds~~ [c] | |
|---|---|
| **Parameter** | **Concentration** |
| Total Suspended Solids | 9 mg/l> |
| Oil & Grease | None Detectable |
| Nitrate | 1.78 mg/l |
| pH | 7.55 s.u. |
| **Outfall: RWSS Pump Strainer and Water Intake Screen Cleaning** | |
| None [d] | None [d] |

Key:

mg/l - milligrams per liter

μg/l - micrograms per liter

Notes:

a. The combined plant effluent discharged to the Susquehanna River includes: effluent from the Combined Waste Water Retention ~~Basin,~~Pond, including the CWS cooling tower blowdown, ESWS cooling tower blowdown, miscellaneous low volume waste, RO wastewater, and RWSS filter backwash; and treated liquid radiological waste, which will be discharged downstream of the Combined Waste Water Retention ~~Basin.~~Pond. b. Concentrations are based on 3 cycles of concentration. c. The parameters and concentrations are based on stormwater sampling conducted at SSES. d. The pump strainers and intake screens will only remove bulk debris and trash. Similar to the existing SSES NPDES permit, it is not anticipated that BBNPP will be required to monitor the discharge from its pump strainers or intake screen wash.

## Table 3.6-10— Hazardous Waste Generation Rates at SSES

| Hazardous Waste | Year/Quantity (lbs/kg) | | | | | |
|---|---|---|---|---|---|---|
| | 2003 | | 2005 | | 2007 | |
| | (lbs) | (kg) | (lbs) | (kg) | (lbs) | (kg) |
| Sulfuric Acid | 2,855 | 1,296 | N/A | N/A | N/A | N/A |
| Ignitable and Listed Solvents | 942 | 428 | N/A | N/A | N/A | N/A |
| Waste Paint, Ink, Lacquer, Varnish | 4,225 | 1,918 | 2,785 | 1,264 | 12,750 | 5,788 |
| Lead Debris | 1,542 | 888 | 200 | 91 | 1,160 | 527 |
| Lab Packs - No Acutely Hazardous | 985 | 447 | 355 | 161 | 1,713 | 778 |
| Solvent Contaminated Debris | N/A | 54 | 130 | 59 | 590 | 268 |
| Boresonic Inspection Solution | 413 | '188 | N/A | N/A | N/A | N/A |
| Iron Oxalate Hexahydrate | N/A | N/A | 650 | 295 | 1,200 | 545 |
| Waste Paint, Solvents, Gasoline and Oil Mixture | N/A | N/A | 560 | 254 | 640 | 290 |
| Initiator Assemblies - Fire Suppression System | N/A | N/A | 145 | 66 | 15 | 7 |
| Aerosols | N/A | N/A | 40 | 18 | N/A | N/A |
| Lab Packs - With Acutely Hazardous | N/A | N/A | 10 | 4 | N/A | N/A |
| Radiological Contaminated Phosphoric Acid Filters and Debris | N/A | N/A | 88 | 40 | N/A | N/A |
| Concrete Sealer, Tectyl 506, Spectrus CT-1300 | N/A | N/A | N/A | N/A | 1,600 | 726 |
| Dichlorofluoromethane, flammable aerosols | N/A | N/A | N/A | N/A | 61 | 28 |
| Broken Fluorescent Lamps | N/A | N/A | N/A | N/A | 60 | 27 |
| Radiological Contaminated Lead Debris | 413 | N/A | 947 | 430 | 306 | 139 |
| Radiological Contaminated Paint, Hydrocarbons | N/A | N/A | N/A | N/A | 222 | 101 |
| Radiological Contaminated Debris Solvents | 119 | N/A | N/A | N/A | 130 | 59 |
| Radiological Contaminated Lab Pack Chemicals | N/A | N/A | N/A | N/A | 77 | 35 |
| Total | 11,494 | 5,218 | 5,910 | 2,683 | 20,524 | 9,318 |

Key:
N/A - Not Applicable
(lbs) - pounds
(kg) - kilogram

## Table 3.6-11— Residual Waste Generation Rates at SSES

| Waste Stream | Amount (tons) | Amount (metric tons) |
|---|---|---|
| Incidental Maintenance Waste (Plant and Office Trash) | 526 | 477 |
| Cooling Tower Sediment | 286 | 259 |
| Cooling Tower Fill | 269 | 243 |
| Waste Oil | 125 | 113 |
| Reactivator/Clarifier (inorganic) Sludge | 39 | 35 |
| Waste Tires | 37 | 34 |
| Discarded/Expired Chemicals | 15 | 14 |
| Alumina Oxide (Sandblasting Grit and Dessicant) | 3 | 3 |
| Oily Waste Debris | 6 | 5 |
| Power Coil Cleaning Solution | <1 | <1 |
| Spill Cleanup (Petroleum) | <1 | <1 |
| Spill Cleanup (Non-Petroleum) | <1 | <1 |
| Alkaline Batteries | <1 | <1 |
| Asbestos Containing Waste | <1 | <1 |
| PCB Containing Light Ballasts and Capacitors | <1 | <1 |