



H. Duncan Brewer
Director, Organizational Effectiveness
Harris Nuclear Plant
6413 Shearon Harris Road
New Mill NC 27562-9300

919.362.2305

May 29, 2014
Serial: HNP-14-064

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

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400

Subject: NPDES Permit Application Amendment Request

Ladies and Gentlemen:

As required by Section 3.2 of the Environmental Protection Plan (Nonradiological), issued as Appendix B to Renewed Facility Operating License No. NPF-63 for the Harris Nuclear Plant, Duke Energy Progress, Inc. is providing a copy of a request for an amendment to the application for renewal of the facility's National Pollutant Discharge Elimination System (NPDES) Permit # NC0039586. The amendment request was mailed to the North Carolina Department of Environment and Natural Resources on May 22, 2014. A copy of the initial permit renewal application was transmitted to the NRC by letter dated January 31, 2011.

If you have any questions or require additional information, please contact Dave Corlett, Manager – Regulatory Affairs, at (919) 362-3137.

Sincerely,

H. Duncan Brewer

Enclosure: NPDES Permit Application Amendment Request

c: Mr. J. D. Austin, NRC Sr. Resident Inspector, HNP
Ms. M. Barillas, NRC Project Manager, HNP
Mr. V. M. McCree, NRC Regional Administrator, Region II

COO1
NRC

Document Control Desk
Serial: HNP-14-064

Enclosure

**NPDES Permit Application Amendment Request
(18 pages including cover)**



Ernest J. Kapopoulos, Jr.
Vice President
Harris Nuclear Plant
5413 Shearon Harris Rd
New Hill NC 27562-9300

919-362-2502

May 22, 2014
Serial: HNP-14-061

Mr. Jeffrey O. Poupart
North Carolina Department of Environment and Natural Resources
Division of Water Resources
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Subject: Permit Application Amendment
Duke Energy Progress, Inc. - Harris Nuclear Plant
New Hill, North Carolina, Wake County
NPDES Permit No. NC0039586

Dear Mr. Poupart:

The current NPDES permit for the Harris Nuclear Plant (HNP) expired on July 31, 2011. In January 2011, Progress Energy Carolinas, now Duke Energy Progress (DEP), submitted a timely renewal application which is currently under review by your staff. DEP hereby amends that NPDES permit application to reflect several changes at the plant.

I. Power Uprate

In April 2012, DEP submitted an application amendment to reflect a power uprate that occurred during a refueling outage. At that time, the increase in generation capacity was stated to be from 900 to 979 megawatts. However, the actual increase was from 900 to 930 MW. We have updated the affected portions of our permit application package to correct this information and included replacement pages in the enclosure to this letter.

II. Sewage Treatment Plant Improvements

The existing HNP sewage treatment plant is permitted to discharge 25,000 gpd of domestic wastewater; however, it is only sized to process 15,000 gpd. DEP is upgrading the sewage treatment plant to fully utilize existing permitted capacity and provide supplemental treatment during high demand periods.

The upgrade will involve the installation of a new primary treatment tank and three "AX-Max" recirculating packed bed filter systems. These units have the ability to be operated partly in parallel with the existing 15,000 gpd plant, and will utilize the existing equalization tank, raw sewage tank, chemical feed system, sand filter, and lift station to discharge flows into Outfall 002. This treatment upgrade is expected to be operational in June 2014. An ATC is not required to install this additional treatment upgrade and the discharge may not exceed a monthly average flow of 25,000 gpd from Outfall 002 under the current permit.

The "AX-Max" system will have an installed treatment capacity of 25,000 gpd. Combined with HNP's existing 15,000 gpd capacity, the plant will have a total installed treatment capacity of 40,000 gpd. DEP requests that the additional discharge capacity be reflected in the draft permit when it is issued by DENR. This modification would provide additional

capacity to discharge during periods when domestic wastewater flows increase due to additional staff (such as during outages and other maintenance events).

In support of DEP's request to increase flows at Outfall 002, we have modified the affected portions of Form 2C Attachment 3 and Attachment 4 from our application package and included replacement pages in the enclosure to this letter.

III. Change to Wastewater Management Practices

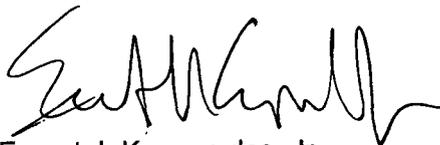
This application amendment also updates the description of wastewater management practices at HNP. HNP has two permitted sewage treatment plants. The first treats domestic wastewater from the main portion of the plant site and discharges to Outfall 002. The other serves the Harris Energy & Environmental Center (HE&EC) and discharges through Outfall 007. For the past several years, HNP has obtained Pump and Haul permits to transport domestic wastewater to HE&EC during periods of high flows. The permits were requested because the hauling activities took place along a public road. A road was recently created wholly on DEP property that allows the transport of domestic wastewater. DEP requests that the NPDES permit reflect HNP's ability to treat domestic wastewater at either sewage treatment plant. HNP's current Pump and Haul permit is effective from April 7, 2014, through October 7, 2014. All hauling activities would occur under that permit until its expiration. DEP does not believe a NPDES permit modification is necessary to allow hauling activities on DEP property. However, we will not move wastewater except under a Pump and Haul permit until we receive concurrence from DENR on this interpretation.

Please replace the affected pages in the current permit application with the replacement pages provided in the enclosure to this letter.

If there are any questions regarding the enclosed information, please contact Toya Ogallo at (919) 546-6647.

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,



Ernest J. Kapopoulos, Jr.

Enclosure: Permit Application Amended Pages

c: Mr. Danny Smith (Supervisor, Water Quality Operations Section, Raleigh Regional Office)

N.C. Division of Water Resources
Serial: HNP-14-061

Enclosure

Harris Nuclear Plant
Permit Application Amended Pages
(15 pages including cover)

FORM 1		U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION Consolidated Permits Program <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER S F NCD991278284
GENERAL		PLEASE PLACE LABEL IN THIS SPACE	GENERAL INSTRUCTIONS If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	Mark "X"			SPECIFIC QUESTIONS	Mark "X"		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes ? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

C	1	SKIP	Harris Nuclear Plant and Harris Energy and Environmental Center
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IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)		B. PHONE (area code & no.)	
C	2	Ernest J. Kapopoulos, Jr. - Vice President - HNP	(919) 362-2502

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX		
C	3	5413 Shearon Harris Road

B. CITY OR TOWN		C. STATE	D. ZIP CODE
C	4	New Hill	NC
15	16	27562	51

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER		B. COUNTY NAME	
C	5	5413 Shearon Harris Road	Wake
C. CITY OR TOWN		D. STATE	E. ZIP CODE
C	6	New Hill	NC
15	16	27562	51

EPA I.D. NUMBER (copy from Item 1 of Form 1)
 NCD991278284

Form Approved.
 OMB No. 2040-0086.
 Approval expires 3-31-98.

Please print or type in the unshaded areas only.

FORM 2C NPDES  **U.S. ENVIRONMENTAL PROTECTION AGENCY**
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER <i>(list)</i>	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER <i>(name)</i>
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
006	35	34	47	78	58	07	Harris Reservoir
007	35	38	05	78	55	05	Harris Reservoir

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. <i>(list)</i>	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	a. OPERATION <i>(list)</i>	b. AVERAGE FLOW <i>(include units)</i>	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1
006	Combined Outfall	See Attachment 3	Discharge to surface water	4-A
	Internal Outfall 001			
	Cooling Tower Blowdown	See Attachment 3	Dechlorination	2-E
	Internal Outfall 002			
	Sanitary Waste Treatment Plant	See Attachment 3	Activated Sludge, Disinfection	3-A 2-F
	Internal Outfall 003			
	Metal Cleaning Waste	See Attachment 3	Neutralization, Sedimentation	2-K 1-U
	Internal Outfall 004			
	Low volume Waste	See Attachment 3	Neutralization, Sedimentation	2-K 1-U
	Internal Outfall 005			
	Radwaste System	See Attachment 3	Multimedia Filtration, Ion Exchange	1-Q 2-J
007	Harris Energy and Environmental	See Attachment 3	Aerated Lagoons, Disinfection	3-B 2-F
	Center Waste Water Treatment Plant		Dechlorination	2-E
	Sanitary Waste Treatment Plant	See Attachment 3	Activated Sludge, Disinfection	3-A 2-F

OFFICIAL USE ONLY (effluent guidelines sub-categories)

Progress Energy Carolinas, Inc.
Harris Nuclear Plant and Harris Energy & Environmental Center
National Pollutant Discharge Elimination System Permit Number NC0039586

Attachment 3

Form 2C - Item II-A Flows, Sources of Pollution, and Treatment Technologies

Stream	Flow @ Maximum Power*	Flow @ Temperature Shutdown*	Notes
1	21,000 gpm	21,000 gpm	Emergency/Testing/ Intermittent use
2	510 MGM	0 – 5 MGM	Varies with dissolved solids
3	864 MGM	9 MGM	Cooling tower make-up
4	648 MGM	4 MGM	Average meteorological condition
5	0 – 14,000 gpm	0 – 14,000 gpm	Cooling tower bypass line
6	500,000 gpm	0 – 284,000 gpm	–
7	500,000 gpm	0 – 284,000 gpm	–
8	300 gpm	0 – 176 gpm	–
9	20,800	0 – 10,000	Intermittent operation
10	300 gpm	0 – 176 gpm	–
11	1.2 MGM	210,000	Condensate polisher regenerations and rinse (Intermittent operation)
12	24,000 gpm	0 – 16,500 gpm	–
13	24,000 gpm	0 – 16,500 gpm	–
14	315,900 gpm	0 – 185,000 gpm	–
15	315,900 gpm	0 – 185,000 gpm	–
16	6 MGM	5 MGM	–
17	208,300	208,300	–
18	0	0	Very infrequent operation
19	666,600	666,600	–
20	500	500	Auxiliary boiler drains
21	50,000 gpm	50,000 gpm	Service water system
22	1,220,800	220,000	Secondary waste (Nonradiological), alternate route
23	0	0	Secondary waste (Radiological), not normally used
24	0 – 1 MGM	–	Make-up as needed
25	7,645,000	7,645,000	–
26	4,000,000	4,000,000	–
27	300 lbs/month	300 lbs/month	Settling basin sludge
28	3,033	3,033	Treated water tank drains

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29	11,000	11,000	Fire pump test
30	8,786,200	8,786,2000	Storm drains includes rainwater and firewater
31	1.2 MGM	1.2 MGM	Potable water
32	2,445,000	2,445,000	--
33	39,000	39,000	Reactor coolant system
34	1,200,000	1,200,000	Demineralized water
35	500	500	Demineralized water to auxiliary boilers
36	11,000	11,000	Fire pump test
37	1,167	1,167	Hydrant and drain tests
38	693,000	693,000	Plant and HE&EC water usage
39	0.2 MGM	0.2 MGM	Sanitary waste
40	--	--	Sludge removal as necessary
41	8,340,000	8,340,000	Yard and roof drains
42	10,000	10,000	--
43	33,300	33,300	--
44	--	--	Makeup as required
45	1,220,800	220,000	Makeup 9 and 11
46	0.025 MGD	0.025 MGD	Sanitary waste (average flow at < 0.025 MGD with peak flows to 0.04 MGD)
47	413,000	413,000	Radwaste
48	10,000 gpm	10,000 gpm	Boron recycle
49	67,000	67,000	Boron Recycle/CVS letdown
50	30	30	Used oil
51	75,000	75,000	Equipment drains
52	316,000	316,000	Floor drains
53	7,000	7,000	Decontaminated waste
54	6,000	6,000	Laboratory waste (chemistry)
55	4,100	4,100	Varies with number of filter backwashes
56	5 - 10 gpm	5 - 10 gpm	Water treatment steam heater drains
57	120,000	120,000	Condenser water box (approximately two drains/year)

Progress Energy Carolinas, Inc.
Harris Nuclear Plant and Harris Energy & Environmental Center
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58	6,950,700	6,950,700	Low-volume waste
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* Units: Gallons per month unless otherwise noted

Progress Energy Carolinas, Inc.
Harris Nuclear Plant and Harris Energy & Environmental Center
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Attachment 4
Form 2C – Item II-B Flows, Sources of Pollution, and Treatment Technologies

HARRIS NUCLEAR PLANT

The Harris Nuclear Plant (HNP) consists of a 930 MW generating unit and associated facilities. The HNP systems include a Westinghouse pressurized water reactor, three re-circulating steam generators, a turbine generator, a one-pass condenser, an open re-circulating (cooling tower) cooling water system, and a lake to makeup water lost by evaporation. In a pressurized water reactor design, steam is produced in the secondary system steam generators using hot water from the reactor core. The primary system does not normally come into contact with any other part of the generating system, such as the steam cycle which includes the turbine and the condenser.

Outfall 006 – Combined Outfall to Harris Lake

The HNP operates on an open re-circulating cooling system using a natural draft cooling tower and 4100 acre makeup water storage reservoir. All five major wastewater discharges at the HNP are combined in a 36-inch diameter common pipe which discharges to the Harris Lake 500 feet offshore at 40 feet below the surface (Discharge Serial No. 006 in this application.) The individual waste streams contributing to the common outfall pipe are: cooling tower blowdown, sanitary waste treatment plant effluent, metal cleaning wastes, low-volume wastes, and radwaste system. (These waste streams are enumerated in the present permit as Discharge Serial Numbers 001, 002, 003, 004, and 005, respectively.) Toxicity testing has been conducted on the combined outfall line since February 1990. Each of the waste streams, as well as miscellaneous discharge points, are described in this narrative. Also included is a list of chemicals which are expected to be in waste streams from the HNP (Attachment 5).

Outfall 001 - HNP Cooling Tower Blowdown discharge to Outfall 006

The cooling tower provides the condenser with a supply of water for removing the heat rejected by the condensation of steam. (The circulating water temperature rise across the condenser is 25°F.) This heat is dissipated primarily by evaporation as the water falls through the tower. This evaporation is essentially pure water vapor, with the dissolved and suspended solids remaining to concentrate.

To prevent the solids from causing scale and corrosion problems, some of the concentrated cooling water is discharged from the cooling tower basin, i.e., blowdown. During plant operation, the cooling tower basin continuously discharges for optimum performance. Blowdown currently averages approximately 6 MGD. Makeup water for cooling tower evaporative losses and cooling tower blowdown is provided from the main reservoir. The cooling tower also serves as a partial source of service water, which is used for non-contact cooling of auxiliary equipment throughout the plant. The cooling tower is infrequently drained

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for maintenance. The normal operating procedure includes draining the residual water to the lake via Discharge Serial No. 006.

Occasionally, the condensers are drained for maintenance and repairs. When the condensers are drained, it is necessary to route the residual water (approximately 60,000 gallons per condenser per event) to area storm drains which discharge to the lake. This water is monitored prior to discharge for appropriate parameters required for cooling tower blowdown in accordance with the NPDES permit. Presently, condenser draining events are reported with relevant monitoring data to DWQ on attachments to monthly Discharge Monitoring Reports.

Outfall 002 - HNP Sewage Treatment Facility discharge to Outfall 006

The HNP is served by a 0.015 MGD extended aeration sewage treatment facility (consisting of an equalization basin, aeration basin, sludge holding tanks, raw sewage holding tanks, clarifiers, and chlorine contact tanks) and a 0.025 MGD recirculating packed bed filter system consisting of three AX-Max treatment units. Disinfected effluent is pumped through a newly installed sand filter (added to help with TSS issues) to common outfall pipe. Currently, sludge is land applied off site by a contract disposal firm (Granville Farms, Inc., Permit No. WQ0000838). Because the HNP sewage treatment facility receives industrial type waste as well as domestic type waste, the land application of the mixed sludge meets the exemption conditions stipulated at 40 CFR Part 503.6.

Approximately 1500-1600 badged personnel are at the site during normal operation with an additional 1000-2000 during HNP outages.

In addition to sanitary waste, HVAC condensate is discharged to the sewage treatment facility.

FRAC tanks, with capacities between 16,000 to 22,000 gallons, are utilized for extra tankage when required.

Outfall 003 - HNP Metal Cleaning Wastes discharge to Outfall 006

Infrequently, cleaning of heat exchanger equipment by chemical solutions may be necessary. Cleaning solutions would be routed to the waste neutralization basin for pH adjustment (or other chemical neutralization) prior to discharge to the settling basin where further treatment by sedimentation occurs. To date, the only metal cleaning which has been conducted was a preoperational flush. If a new system is added in the future or if an existing system is changed out, flushing could be necessary again. Also, metal cleaning may be needed in the future for plant systems (e.g., steam generators, auxiliary boilers, piping, etc.). Chemical solutions used may include phosphates, organic cleaners, citric acid, or oxalic acid.

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Outfall 004 - HNP Low-Volume Wastes discharge to Outfall 006

In the operation of the HNP, there are many processes which result in intermittent low volumes of various waste streams. Low-volume waste is treated by neutralization (for pH adjustment), sedimentation, and separation. These wastes may be treated in the oily waste separator and/or neutralization basin as needed prior to routing to the sedimentation basin, which ultimately discharges to the common outfall line. Annually as a maintenance practice this basin may be physically cleaned using chlorine, a bisulfate is added after cleaning to remove the chlorine before discharge. Chemicals present in these systems may include corrosion products (such as copper and iron) corrosion inhibitors (such as nitrites, molybdates, ammonia, hydrazine, carbonylhydrazide, and ethanolamine), acids and bases from water treatment processes, and wastewater from ion exchange processes and ammonium bisulfite from dechlorination. Low-volume waste flow from the settling basin averages approximately 0.2 MGD. The various low-volume waste sources are described below:

- a) Water treatment system wastes from processing of demineralized water and potable water.

(The water treatment system includes coagulation, filtration, disinfection, and ion exchange. Wastes from treatment include filter backwash and demineralizer regeneration wastes.)

- b) Non-radioactive oily waste, floor drains, and chemical tank containment drains.

(Turbine building wastes which could contain oil are routed to the oily waste separator for treatment prior to routing to the neutralization basin. Used oil is collected by a contractor for reclamation.)

- c) Steam generator and auxiliary boiler draining following wet layup
- d) Non-radioactive secondary waste from condensate polishers
- e) Miscellaneous drains/leaks from condenser, steam generator, and secondary components
- f) Auxiliary boiler system blowdown
- g) Miscellaneous waste streams not otherwise identified elsewhere in this application.

Outfall 005 - HNP Radwaste Treatment System discharge to Outfall 006

The radwaste system is designed to collect, store, process, and release any radioactive or potentially radioactive liquids associated with operation of the nuclear power plant. The waste streams are collected in tanks and sampled for conventional pollutants and radioactivity. The

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specific batch treatment is selected based on these analytical results. This allows for selection of the proper treatment processes for each individual batch. Most radwaste streams are treated by the Modular Fluidized Transfer Demineralization System (MFTDS) that uses filtration and ion exchange in a manner that minimizes the production of solid wastes. Boric acid is recycled. The secondary waste system (SWS) is for treating radioactively-contaminated water from the secondary steam cycle system; however, since that system is not normally contaminated, those flows are routed to the normal low-volume waste treatment system after radiological monitoring.

After treatment, the radwaste flows are stored in one of four tanks: the secondary waste sample tank, the treated laundry and hot shower tank, the waste monitor tank, or the waste evaporator condensate tank. After monitoring to verify adequate treatment, the tanks are discharged to the common outfall line.

The cooling tower bypass line provides a flow of lake water for radwaste releases, as regulated by the NRC.

Other HNP Discharges

1. Storm Drains

Runoff from parking lots, outside storage areas, roof drains, and other areas on the plant site are collected in storm drains and ultimately routed to release points which discharge to Harris Lake. Flow contributed from those areas is estimated at 8.8 million gallons per month, based on average rainfall of 43 inches per year and a runoff assumption factor of 0.7.

In addition to stormwater, a few miscellaneous sources of water are also intermittently routed to the storm drains. These sources that have a minor contribution to overall storm drain flows are as follows:

a. Upflow filter clear well drains

The upflow filter clearwell stores filtered lake water which is used in the potable water treatment system. Periodically, some of the water from this tank is drained to the storm drains that discharge to Harris Lake. This water may contain low concentrations of chlorine because sodium hypochlorite is added to control biological growth in the tank prior to treatment through the upflow filter.

b. Heat exchanger on the demineralizer feedwater

It is necessary to heat the source water to the demineralized water treatment system to achieve optimum degassification. To accomplish this, steam is used to heat the feedwater. The condensed steam is discharged to the storm drains that

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flow to Harris Lake at approximately 5 - 10 gallons per minute. This steam could contain trace amounts of hydrazine and ammonia used for chemistry control in the auxiliary boiler steam system. Due to the low flow rate and the long retention time, the temperature of the condensed steam should be at ambient temperature upon reaching the lake.

c. Condenser water box drains

Prior to condenser maintenance or repairs it is sometimes (approximately twice/year) necessary to drain circulating water to the storm drains (approximately 60,000 gallons per condenser per event) that discharge to Harris Lake. This water is monitored for selected cooling tower blowdown parameters.

d. Filtered water storage tank

Water from the upflow filter clearwell is treated using a micro-filtration unit for turbidity control and then stored in a tank prior to subsequent filtration (nanofiltration unit) and disinfection. Occasionally, some water from this tank may be drained to the storm drains that discharge to Harris Lake. This water may contain trace amounts of chlorine.

e. Fire protection system

Approximately 5000 gallons of lake water used for annual testing of the fire protection system is routed to most of the storm drains that discharge to Harris Lake. In the event of a fire, additional water could be discharged to storm drains.

f. Condenser hotwell

During outages (approximately once per 18 months) it is necessary to drain the condenser hotwell for condenser maintenance and inspection. Approximately 70,000 gallons of this water resulting from condensed steam is drained to storm drains that discharge to Harris Lake. It may contain trace amounts of ethanalamine, 100 ppb or less of boron, and 100 ppb or less ammonia.

g. Condensate storage tank

Infrequently it is necessary to drain the condensate storage tank for maintenance. Approximately 400,000 gallons per event is drained to storm drains that discharge to Harris Lake. It may contain 200 ppb or less boron, 1000 ppb or less ammonia, and trace hydrazine.

h. Air conditioning system condensate

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The condensate from various building air conditioning systems flows to various storm drains to Harris Lake. The volume is generally low and is greatest in the humid summer months.

i. Service water system strainers

Infrequently, when service water strainers located at the makeup pumps from the cooling tower basin are backwashed to remove biofouling organisms or debris, a small volume of service water overflows the basin and runs to the adjacent storm drain that discharge to Harris Lake.

j. Maintenance Activities

During maintenance activities at the facility it may become necessary to drain all or some portion thereof of the following plant systems; normal service water, emergency service water, circulating water, potable water, and demineralized water. Maintenance activities at the facility may also require the hydrostatic flushing of system piping with discharge to the storm drain system. In addition, the facility may find it necessary to wash equipment with demineralized water with the discharge to storm drains

2. Emergency Service Water System

This system primarily provides non-contact cooling water for nuclear safety-related equipment systems and during emergency conditions. The emergency service water system discharges to the auxiliary reservoir which is used as the plant's heat sink during emergency conditions, a feature required by Nuclear Regulatory Commission regulations to provide a reliable supply of cooling water. Under normal operating conditions, the auxiliary and the main reservoirs are isolated from each other; however, the reservoirs may be connected as necessary. In addition to emergency situations, this system is used periodically for testing purposes or for containment cooling as needed. This water may contain traces of chemicals identified for the cooling tower blowdown.

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HARRIS ENERGY & ENVIRONMENTAL CENTER

The Harris Energy & Environmental Center (HE&EC) includes facilities that provide support services (laboratories and training classrooms) for the HNP and other CP&L operations. The sources of wastewater at the HE&EC are domestic waste, conventional laboratory waste, cooling tower blowdown, and potentially radioactive liquid waste from the radiochemistry and metallurgy laboratories. Additionally, floor drains from several shops and storage buildings are routed to the wastewater treatment facility. All waste streams, with the exception of the radiological wastewater, receive treatment in the 0.020 MGD wastewater facility.

Components of the treatment facility include a bar screen, submersible pump station as an influent pump station, three treatment ponds, sand filtration, chlorination and dechlorination, as well as the various lift stations for the HE&EC's various buildings. The pond portion of the treatment facility consists of an aerated pond with a minimum retention time of 10 days followed by a stabilization pond, also with a minimum retention time of 10 days. The third pond is a polishing pond with a minimum 2-day retention time. Effluent from the treatment facility is discharged via the effluent discharge pipe into Harris Lake.

If necessary sludge from the treatment facility will be removed and land applied by a contractor (a contractor for sludge disposal will be chosen when needed). Because the treatment facility receives industrial type waste as well as domestic type waste, the land application of the mixed sludge meets the exemption conditions stipulated as 40 CFR 503.6

Domestic Waste

The maximum domestic waste flow from the HE&EC sanitary facilities is approximately 0.014 MGD. In addition to the approximately 125 permanent employees on the site, the HE&EC, serving as a company training facility and as a visitors' center for the nearby HNP, accommodates a fluctuating population (ranging from 0 to 450 additional people per day during normal operation to 1000 to 2000 during HNP outages). Wastewater from the HNP may also be conveyed over plant roads to the HE&EC for treatment during times where sanitary flows generated onsite exceed the capacity of the HNP sewage treatment plant.

Laboratory Waste

Laboratory waste flow, consisting primarily of rinse water from the chemical, metallurgical, and biological laboratories, is approximately 0.001 MGD. HE&EC personnel are educated in the proper disposal of laboratory wastes and are encouraged to minimize the use of laboratory drains for chemical disposal. Most laboratory chemical wastes and virtually all oily wastes are drummed for off-site disposal. Laboratory wastes that are not drummed may go to one of two 5,000 gallon holding/neutralization tanks for visual inspection and testing before being discharged to the influent pump station.

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Cooling Tower Blowdown

Cooling tower blowdown from the HE&EC air conditioning system averages approximately 0.002 MGD. Chemical additives include an algicide (aqueous glutaraldehyde solution) and a suspension agent. The treatment and extended retention time in the ponds should ensure no algicide is discharged to Harris Lake.

Radiological Wastewater

The majority of the radiological wastewater results from the cleaning of laboratory glassware. In addition, small quantities of liquid radiochemistry laboratory samples, radioactive metallurgy laboratory wastewater (which is prefiltered with a paper cartridge to remove particulates before disposal), liquids generated from analyses of plant 10 CFR Part 61 samples, and reagents are disposed via the HE&EC radiochemistry laboratory drains to a holding tank. Approximately 5,000 gallons are discharged annually from the holding tank, as allowed by the radioactive materials License No. 092-0218-4, issued by the N.C. Division of Radiation Protection. The effluent from the radiological holding tank combines with the effluent from the sewage treatment plant and discharges into Harris Lake.

Radiochemical analyses are performed prior to release to calculate the total activity in the waste. These analyses include gamma spectrum analysis using intrinsic germanium gamma spectrometry systems, as well as direct analysis for Tritium, Iron-55, Nickel-63 and Strontium-89/90. Individual radionuclides have different release limits, however, the total Tritium activity discharged per calendar year shall not exceed 20 millicuries, and the total activity excluding Tritium discharge per calendar year shall not exceed 5 millicuries.

Additionally, the pH of the wastewater is determined before release. The pH must be between six and nine and is adjusted, if necessary, using 50% sodium hydroxide. The tank is agitated after addition of the sodium hydroxide, and an additional sample is analyzed to verify that the appropriate pH adjustment is achieved.

Stormwater

Stormwater runoff from the HE&EC is composed of parking lot, roof, and lawn drainage. This non-industrial stormwater is not subject to the Phase I stormwater regulations of 40 CFR Part 122.