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U. S. Nuclear Regulatory Commission
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Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
NPDES PERMIT NO. SC0030856 MODIFICATION

South Carolina Electric & Gas Company (SCE&G) hereby submits a copy of a modification to the Virgil C. Summer Nuclear Station National Pollutant Discharge Elimination System (NPDES) permit. The revision was approved by the South Carolina Department of Health and Environmental Control on March 12, 2003, with an effective date of April 1, 2003.

Should you have any questions regarding this submittal, please contact Ms. Susan B. Reese at (803) 345-4591.

Very truly yours,



Melvin N. Browne

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COO1

Part III. Limitations and Monitoring Requirements

A. Effluent Limitations and Monitoring Requirements

1. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 001: once through noncontact cooling water to the Monticello Reservoir

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	Mass		Concentration			Sampling Frequency	Sample Type
	Monthly Average	Daily Maximum	Daily Minimum	Monthly Average	Daily Maximum		
Flow	MR ¹ , MGD	MR ¹ , MGD	-	-	-	Continuous	Estimate ²
Intake Temperature ³	-	-	-	MR ¹	MR ¹	Continuous	Continuous
Plume Temperature ⁴	-	-	-	32.2°C(90°F)	MR ¹	Continuous	Continuous
Discharge Temperature ⁵	-	-	-	MR ¹	45°C(113°F)	Continuous	Continuous
Copper ^{6,7}	-	-	-	MR ¹	MR ¹	1/Month	Grab
Iron ⁷	-	-	-	MR ¹	MR ¹	1/Month	Grab
Manganese ⁷	-	-	-	MR ¹	MR ¹	1/Month	Grab
pH	-	-	6.0 s.u.	-	8.5 s.u.	1/Month	Grab

¹MR: Monitor and Report

²See Part II.J.1

³Intake temperature shall be measured on the inlet side of the main condenser

⁴Plume temperature shall be taken at the intake structure of Fairfield Pumped Storage Facility when the Fairfield Pumped Storage Facility is generating

⁵Discharge temperature shall be monitored at the outlet corresponding to an individual unit prior to mixing with the receiving stream

⁶See Part V.A.4

⁷See Part V.A.5

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s) unless otherwise specified: after treatment but prior to mixing with the receiving stream.

There shall be no addition of chlorine to the main condenser cooling water

Part III. Limitations and Monitoring Requirements

A. Effluent Limitations and Monitoring Requirements

2. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 003: low level radiological wastes to the Broad River

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	Mass		Concentration			Sampling Frequency	Sample Type
	Monthly Average	Daily Maximum	Daily Minimum	Monthly Average	Daily Maximum		
Flow	MR ¹ , MGD	MR ¹ , MGD	-	-	-	1/Occurrence ³	Estimate ²
Total Suspended Solids	-	-	-	30 mg/l	100 mg/l	1/Occurrence ³	Grab
Oil & Grease	-	-	-	15 mg/l	20 mg/l	1/Occurrence ³	Grab
pH	-	-	6.0 s.u.	-	9.0 s.u.	1/Month	Grab

¹MR: Monitor and Report

²See Part II.J.1

³Samples shall be taken at least once per occurrence of discharge but need not be more than once per month

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s) : the nearest accessible point after the discharge from the Liquid Waste Processing System or the Waste Monitor Tanks, but prior to mixing with the receiving stream.

Part III. Limitations and Monitoring Requirements

A. Effluent Limitations and Monitoring Requirements

11. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 014: combination of internal Outfalls 005, 06A, 06B and 008 to the Monticello Reservoir

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	Mass		Concentration			Sampling Frequency	Sample Type
	Monthly Average	Daily Maximum	Daily Minimum	Monthly Average	Daily Maximum		
Flow	MR ¹ , MGD	MR ¹ , MGD	-	-	-	Continuous	Continuous ²
Total Residual Chlorine ³	-	-	-	0.011 mg/l	0.019 mg/l	1/Month	Grab
Ammonia	-	-	-	2.1 mg/l	4.2 mg/l	1/Month	Grab
Copper	-	-	-	0.028 mg/l	0.039 mg/l	1/Month	Grab
pH (April – October)	-	-	6.0 s.u.	-	9.0 s.u.	1/Month	Grab
pH (November – March)	-	-	6.0 s.u.	-	8.5 s.u.	1/Month	Grab

¹MR: Monitor and Report

²See Part II.J.1

³See Part V.A.4

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s) unless otherwise specified: after discharge but prior to mixing with the receiving stream.

B. Effluent Toxicity Limitations and Monitoring Requirements

1. During the period beginning on the effective date and lasting through the expiration date, the permittee is authorized to discharge from outfall 001: once through noncontact cooling water to the Monticello Reservoir

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Quarterly Average ¹	Maximum ¹	Measurement Frequency	Sample Type
WET Chronic Testing @ CTC=100%	25 % ²	40 % ²	1/Quarter ³	Grab
Whole Effluent Toxicity Chronic Testing -Reproduction @ CTC=100%	MR % ²	MR % ²	1/Quarter ³	Grab
Whole Effluent Toxicity Chronic Testing - Mortality @ CTC= 100%	MR % ²	MR % ²	1/Quarter ³	Grab

¹Quarterly average is defined as the mean of percent effects for all valid tests performed during the monitoring period following the procedures given in Part V.B.1.d. Maximum is defined as the highest percent effect of all valid tests performed during the monitoring period following the procedures in Part V.B.1.d.

²See Part V.B.1 for additional toxicity reporting requirements. MR = Monitor and Report.

³Valid tests must be separated by at least 13 days (from the time the first sample is taken to start one test until the time the first sample is taken to start a different test). There is no restriction on when a new test may begin following a failed or invalid test.

- a. Samples used to demonstrate compliance with the discharge limitations and monitoring requirements specified above shall be taken at or near the final point-of-discharge but, prior to mixing with the receiving waters or other waste streams.
- b. If only one valid test is conducted during a quarter, results from that test must be used to assess compliance with the quarterly average limit as well as the maximum limit. If more than one valid test is completed during the quarter, the mean percent inhibition of all valid tests must be used to demonstrate compliance with the quarterly average limit.
- c. Valid test results from split samples shall be reported on the DMR. For reporting an average on the DMR, individual valid results for each test from a split sample are averaged first to determine a sample value. That value is averaged with other sample results obtained in the reporting period and the average of all sample results reported. For reporting the maximum on the DMR, individual valid results for each test from a split sample are averaged first to determine a sample value. That value is compared to other sample results obtained in the reporting period and the maximum of all sample results reported. For the purposes of reporting, split samples are reported as a single sample regardless of the number of times it is split. All laboratories used shall be identified on the DMR attachment.

Part V. Other Requirements

A. Effluent Requirements

1. There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the effluent cause a visible sheen on the receiving waters.
2. Unless authorized elsewhere in this Permit, the permittee must meet the following requirements concerning maintenance chemicals for the following waste streams: once-through noncontact cooling water, recirculated cooling water, boiler blowdown water, and air washer water. Maintenance chemicals shall be defined as any man-induced additives to the above-referenced waste streams.
 - a. Detectable amounts of any of the one hundred and twenty-six priority pollutants is prohibited in the discharge, if the pollutants are present due to the use of maintenance chemicals.
 - b. Slimicides, algicides and biocides are to be used in accordance with registration requirements of the Federal Insecticides, Fungicide and Rodenticide Act.
 - c. The use of maintenance chemicals containing bis(tributyltin) oxide is prohibited.
 - d. Any maintenance chemicals added to the above-referenced waste streams must degrade rapidly, either due to hydrolytic decomposition or biodegradation.
 - e. Discharges of maintenance chemicals added to waste streams must be limited to concentrations which protect indigenous aquatic populations in the receiving stream.
 - f. The permittee must keep sufficient documentation on-site that would show that the above requirements are being met. The information shall be made available for on-site review by Department personnel during normal working hours.
 - g. The occurrence of instream problems may necessitate the submittal of chemical additive data and permit modification to include additional monitoring and limitations.
3. The company shall notify SCDHEC in writing no later than sixty (60) days prior to instituting use of any additional maintenance chemicals in the cooling water system. Such notification shall include:
 1. Name and general composition of the maintenance chemical
 2. Quantities to be used
 3. Frequency of use
 4. Proposed discharge concentration
 5. EPA Registration number, if applicable
 6. Aquatic toxicity information
4. The Water Quality-Based Effluent Limitations (WQBEL) for the parameters listed are not quantifiable using EPA-approved analytical methods. Therefore, the practical quantitation limit (PQL) using the analytical method stated below shall be considered as being in compliance with the limit provided appropriate

biological monitoring requirements are incorporated into the permit.

<u>Parameter</u>	<u>Analytical Method</u>	<u>PQL</u>
Total Residual Chlorine	SM4500C1B, C, D, F or G	50 µg/l

5. This permit may be reopened to eliminate monitoring requirements if reasonable potential is determined not to exist or to include limitations if the discharge causes, has the reasonable potential to cause or contributes to an instream water quality violation for copper, iron and manganese based on two years of data collected at the sampling frequency stated in Part III.

B. Whole Effluent Toxicity and Other Biological Monitoring Requirements

1. For the limits identified in Part III.B.1:

- a. A three brood chronic toxicity test shall be conducted at the frequency stated in Part III.B, "Effluent Toxicity Limitations and Monitoring Requirements," using the CTC of 100% and the following test concentrations: 0% (control), 50%, 60%, 71% and 84% effluent. The permittee may add additional test concentrations without prior authorization from the Department provided that the test begins with at least 10 replicates in each concentration and all data is used to determine permit compliance.
- b. The test shall be conducted using EPA Method 1002.0 in accordance with "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," (EPA/600/4-91/002; 3rd ed., 1994) using *Ceriodaphnia dubia* as the test species.

support its request that alternative thermal effluent limitations be allowed under Section 316(a) of the Act. In April 30, 1976, a determination was made that the permittee had submitted adequate information to demonstrate that the alternative limitations for the thermal component of the discharge would assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the Monticello Reservoir. The alternate maximum discharge temperature for Outfall 001 is 45°C(113°F). A maximum thermal plume temperature of 32.2°C(90°F) and temperature rise of 1.66°C(3.0°F) is also imposed. On December 4, 2000, the permittee requested that the requirement to monitor the plume temperature rise be eliminated. There have been no observed adverse impacts to the aquatic environment attributed to the plume temperature rise. DMR data from 1993 until present shows that there have been no violations of the 3 F plume temperature rise. The Department agreed that there was no useful data being generated by the continuous monitoring at Monticello Reservoir and the request to remove plume temperature rise monitoring requirements from the permit was granted August 2001.

A continuation of the 316(a) variance was allowed by the reissuance of the NPDES permit on July 1, 1984, January 3, 1989, and June 19, 1997. A request to continue the variance was included as part of the application for reissuance of the NPDES Permit which was received on April 17, 2002. In order to support the request, the permittee has indicated there has been no change in facility operation and no change in the biological community. A tentative determination has been made that continuation of the 316(a) variance is appropriate in the reissuance of this permit.

5. Other Information: In addition to the discharge temperature, the permittee monitors and reports the plume temperature at the inlet structure as well as the intake temperature on the inlet side of the main condenser.
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: yes
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL:
9. Conclusion: Based on the approved 316(a) study, the limit is
 - Discharge Temperature:
 - Monthly average: MR
 - Daily maximum: 45°C (113°F)
 - Sampling Frequency: Continuous
 - Sample type: Continuous
 - Intake Temperature:
 - Monthly average: MR
 - Daily maximum: MR
 - Sampling Frequency: Continuous
 - Sample type: Continuous
 - Plume Temperature:
 - Monthly average: 32.2°C (90°F)
 - Daily maximum: MR
 - Sampling Frequency: Continuous
 - Sample type: Continuous

Copper

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): 1.84 µg/l
3. DMR Data: N/A

4. Water Quality Criterion: see spreadsheet
5. Other Information:
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: Yes, based on Aquatic Life from R.61-68
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.010 mg/l
9. Conclusion: In a letter dated September 24, 2002, the permittee stated that there was no source for copper in this outfall and that the level of copper in the discharge is equal to the amount of copper in the intake. As explained in Section II.G.2.b.i.2, if the background concentration is equal to or greater than the applicable stream standard for the parameter of concern, then the derived concentration limit ($C_{eq/lye}$) for that parameter and for the protection of that stream standard, is established equal to the stream standard. The Department does not have any intake data to compare to the discharge data. However, due to the fact that there is insufficient data to do a reasonable potential calculation, the limit for copper shall be monitor and report. A reopener clause will be added to Part V.A in order to evaluate the monitoring data for reasonable potential. Reasonable potential may be evaluated after each sample using the guidelines established in the permit rationale. (In accordance with Part II.J.4.b.(1), zero may be used in the calculation when the PQL stated above is achieved.) At any time reasonable potential is determined not to exist, the permittee may submit a written request that copper monitoring be discontinued. In addition, the permittee may conduct a dilution study, mixing zone study, recalculation procedure, water-effect ratio procedure, resident species procedure or other EPA-approved procedure in order to either eliminate the monitoring requirement for copper or obtain a site specific limit.
Daily maximum: Monitor and Report
Monthly Average: Monitor and Report
Sampling Frequency: 1/Month
Sample type: Grab

Mercury

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): <0.200 µg/l
3. DMR Data: N/A
4. Water Quality Criterion: see spreadsheet
5. Other Information: The data submitted on the Form 2C was above the PQL. The permittee resampled and the result for the effluent was 2.41 ng/l.
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: No
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.0005 µg/l; EPA Method 1669/1631E
9. Conclusion: The reasonable potential calculation using the new sample for mercury of 2.41 ng/l is as follows. The

number of samples (n) is equal to 1, and the highest value from this data set is 2.41 ng/l. The Coefficient of Variation for a data set where $n < 10$ is estimated to equal 0.6.

The Reasonable Potential Multiplying Factor (RPMF) from Table 3-2 is 6.2. The reasonable potential multiplying factor is used with the highest data point to give the 95% Confidence Level and 95% Probability Basis for the highest reasonable potential for the parameter. Multiply the RPMF by the highest value in the data set to obtain the maximum receiving water concentration as follows: $RWC = 6.2 \times 0.0000241 = 0.0000149 \text{ mg/l}$

The governing criterion for mercury is the Human Health limit of 0.000051 mg/l. Since the RWC is less than the Human Health limit, there is no reasonable potential for excursion above ambient criteria. Therefore, there shall be no limit for mercury based on reasonable potential.

Aluminum

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): 416 $\mu\text{g/l}$
3. DMR Data: N/A
4. Water Quality Criterion: see spreadsheet
5. Other Information:
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: Yes, based on Aquatic Life from 53 FR 33178, 8/30/88
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.05 mg/l
9. Conclusion: Due to the fact that there is no state standard, there shall be no limit for aluminum.

Iron

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): 443 $\mu\text{g/l}$
3. DMR Data: N/A
4. Water Quality Criterion: see spreadsheet
5. Other Information:
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: Yes, based on Human Health Water/Organism Consumption from R.61-68

7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.02 mg/l
9. Conclusion: In a letter dated September 24, 2002, the permittee stated that the level of iron in the discharge is equal to the amount of iron in the intake. As explained in Section II.G.2.b.i.2, if the background concentration is equal to or greater than the applicable stream standard for the parameter of concern, then the derived concentration limit ($C_{eq/lye}$) for that parameter and for the protection of that stream standard, is established equal to the stream standard. The Department does not have any intake data to compare to the discharge data. However, due to the fact that there is insufficient data to do a reasonable potential calculation, the limit for iron shall be monitor and report. A reopener clause will be added to Part V.A in order to evaluate the monitoring data for reasonable potential. Reasonable potential may be evaluated after each sample using the guidelines established in the permit rationale. (In accordance with Part II.J.4.b.(1), zero may be used in the calculation when the PQL stated above is achieved.) At any time reasonable potential is determined not to exist, the permittee may submit a written request that iron monitoring be discontinued. In addition, the permittee may conduct a dilution study, mixing zone study, recalculation procedure, water-effect ratio procedure, resident species procedure or other EPA-approved procedure in order to either eliminate the monitoring requirement for iron or obtain a site-specific limit.
Daily maximum: Monitor & Report
Monthly Average: Monitor & Report
Sampling Frequency: 1/Month
Sample type: Grab

Manganese

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): 51.5 $\mu\text{g/l}$
3. DMR Data: N/A
4. Water Quality Criterion: see spreadsheet
5. Other Information:
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: Yes, based on Human Health Water/Organism Consumption from R.61-68
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.01 mg/l
9. Conclusion: In a letter dated September 24, 2002, the permittee stated that the level of manganese in the discharge is equal to the amount of manganese in the intake. As explained in Section II.G.2.b.i.2, if the background concentration is equal to or greater than the applicable stream standard for the parameter of concern, then the derived concentration limit ($C_{eq/lye}$) for that parameter and for the protection of that stream standard, is established equal to the stream standard. The Department does not have any intake data to compare to the discharge data. However, due to the fact that there is insufficient data to do a reasonable potential calculation, the limit for manganese shall be monitor and report. A reopener clause will be added to Part V.A in order to evaluate the monitoring data for reasonable potential. Reasonable potential may be evaluated after each sample using the guidelines established in the permit rationale. (In accordance with Part II.J.4.b.(1), zero may be used in the calculation when the PQL stated above is achieved.) At any time reasonable potential is determined not to exist, the permittee may submit a written request that manganese

pH

1. Previous Permit Limits (effective 10/1/1997):
October – April: 6.0 – 8.5 standard units
May – September: 6.0 – 9.0 s.u.
Sampling Frequency: 1/Month
Sample type: Grab
2. NPDES Application (2C & 2E): (No. of pH analyses: 12)
Minimum: 6.9 standard units.
Maximum: 9.0 standard units.
3. DMR Data: The highest pH was reported on 10/01 as 9.0 s.u. and the lowest pH was reported on 11/97 as 6.3 s.u.
4. Water Quality Data: Effluent Limits for pH are established in accordance with Reg. 61-68.G. 10. For Class Fresh Water this value is 6.0 – 8.5 standard units.
5. Effluent limitation guidelines: N/A
6. Other information: On December 6, 1999, VC Summer requested an alternate limit for pH of 6.0 - 9.5 s.u. during the months of May - September. The request was a result of permit violations for pH, which the permittee attributed to an algae growth problem due to high temperatures and dry weather during the summer. The Watershed Water Quality Management Strategy for the Broad Basin (Technical Report No. 001-98) issued by SCDHEC shows an increasing trend for pH in Lake Monticello and classified uses are being maintained. The Department therefore concludes that there is not an anthropogenic cause for the algal growth. VC Summer requested that the pH variance months be changed to April – October. The algae blooms have been starting earlier and lasting longer due to the extreme drought and heat.
7. PQL: Not applicable
8. Conclusion:
November – March: 6.0 – 8.5 standard units
April – October: 6.0 – 9.0 s.u.
Sampling Frequency: 1/Month
Sample type: Grab

Copper

1. Previous permit limits:
Daily maximum: 0.028 mg/l
Monthly Average: 0.039 mg/l
Sampling Frequency: 1/Month
Sample type: Grab
2. NPDES Application (2C & 2E): 3.38 µg/l
3. DMR Data: 0.035 mg/l (10/97)
4. Water Quality Criterion: see spreadsheet
5. Other Information:

7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.010 mg/l
9. Conclusion: Based on reasonable potential, limit shall be imposed for copper. A schedule of compliance shall be included to allow time to comply with the limit.
Daily maximum: 0.007 mg/l
Monthly Average: 0.009 mg/l
Sampling Frequency: 1/Month
Sample type: Grab

Mercury

1. Previous permit limits: N/A
2. NPDES Application (2C & 2E): <0.200 µg/l
3. DMR Data: N/A
4. Water Quality Criterion: see spreadsheet
5. Other Information: The data submitted on the Form 2C was above the PQL. The permittee resampled and the result for the effluent was 1.62 ng/l and 1.56 ng/l.
6. Does the discharge cause, have the Reasonable Potential to Cause or Contribute: No
7. Effluent limitations guidelines (ELGs) and professional judgment-based limits: N/A
8. PQL: 0.0005 µg/l; EPA Method 1669/1631E
9. Conclusion: The reasonable potential calculation using the new samples for mercury of 1.62 ng/l and 1.56 ng/l is as follows. The number of samples (n) is equal to 2, and the highest value from this data set is 1.62 ng/l. The Coefficient of Variation for a data set where n<10 is estimated to equal 0.6.

The Reasonable Potential Multiplying Factor (RPMF) from Table 3-2 is 3.8. The reasonable potential multiplying factor is used with the highest data point to give the 95% Confidence Level and 95% Probability Basis for the highest reasonable potential for the parameter. Multiply the RPMF by the highest value in the data set to obtain the maximum receiving water concentration as follows: $RWC = 3.8 \times 0.00000162 = 0.00000616$ mg/l

The governing criterion for mercury is the Human Health limit of 0.000051 mg/l. Since the RWC is less than the Human Health limit, there is no reasonable potential for excursion above ambient criteria. Therefore, there shall be no limit for mercury based on reasonable potential.

Aluminum