



Commonwealth Edison  
Byron Nuclear Station  
4450 North German Church Road  
Byron, Illinois 61010

August 6, 1993

LTR: BYRON 93-0374

FILE: 2.12.1522 (1.10.0101)

Mr. J. B. Martin, Administrator  
Nuclear Regulatory Commission Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

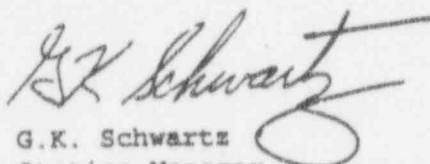
SUBJECT: Semi-Annual Radiological Effluent Release Report  
Byron Station Units 1 and 2  
Facility Operating License Nos. NPF 37 and 66  
NRC Docket Nos. 50-454 and 50-455

Dear Mr. Martin:

Enclosed is the Semi-Annual Radiological Effluent Release Report for January through June, 1993, for Byron Nuclear Power Station. This report is required per Technical Specification 6.9.1.7.

Two copies of the report are provided for your use. Two copies will be forwarded to the Document Control Desk and one copy to the Resident Inspector.

Sincerely,

  
G.K. Schwartz  
Station Manager  
Byron Nuclear Power Station

GKS/DD/rp

Enclosure

cc: Distribution List Attached

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SEMI-ANNUAL RADIOLOGICAL EFFLUENT RELEASE REPORT

DISTRIBUTION LIST

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Regulatory Commission

Nuclear Regulatory Commission, Region III

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Byron Station Central Files, File Number 2.12.1522

Health Physics Services Supervisor - Byron Nuclear Power Station

Radiological Effluent Monitoring Program Coordinator

NRC Senior Resident Inspector - Byron Nuclear Power Station

B.P.I. Associates General Counsel

Illini State Park Site Superintendent

Nuclear Oversight Manager

BYRON NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL REPORT  
JANUARY through JUNE 1993  
Supplemental Information

1. Regulatory Limits

a. Fission and activation gases:

10CFR20 Whole Body = 500 mrem/year  
Skin = 3000 mrem/year

10CFR50 Gamma = 5 mrad/quarter; 10 mrad/year  
Beta = 10 mrad/quarter; 20 mrad/year

b. Iodine: (summed with particulate, see below)

c. Particulates with half-lives > 8 days:

10CFR 20 Organ = 1500 mrem/year

10CFR 50 Organ = 7.5 mrem/quarter; 15 mrem/year

d. Liquid effluents:

10CFR50 Whole Body = 1.5 mrem/quarter; 3 mrem/year

Organ = 5 mrem/quarter; 10 mrem/year

2. Maximum Permissible Concentration

a. Fission and Activation Gases: 10CFR20 Appendix B Table II

b. Iodine: 10CFR20 Appendix B Table II

c. Particulates: 10CFR20 Appendix B Table II

d. Liquid Effluents: 10CFR20 Appendix B Table II

3. Average Energy: This item is not applicable. Release rates are calculated using an isotopic mix rather than average energy.

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases: Prior to release, the isotopic content is determined. Released activity is calculated using volume of release, which is determined by the change in tank or containment pressure. Additional methods of calculation utilize historical data and assign an isotopic mix which is representative of normal vent stack isotopics.

b. Particulate, Tritium and Iodine sampling media for the plant vent stacks are collected and isotopically analyzed daily for the plant vent stacks.

BYRON NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL REPORT  
JANUARY through JUNE 1993  
Supplemental Information  
(continued)

- c. Liquids effluents: Batch releases are isotopically analyzed prior to release. Total release activity is calculated using volume of release. Total tritium activity released is calculated from the highest of a monthly circulating water blowdown composite activity or a sum of the input composite activities.
  - d. Analysis results which are less than the lower limit of detection (<LLD) are reported in units of Ci/ml unless otherwise noted. All LLD values are listed in Attachment A.
5. Batch Releases:
- a. Liquid:
    - 1. Number of batch releases = 185
    - 2. Total time period for batch releases = 17,755 minutes.
    - 3. Maximum time period for a batch release = 231 minutes.
    - 4. Average time period for a batch release = 96 minutes
    - 5. Minimum time period for a batch release = 60 minutes
    - 6. Average stream flow during periods of release of effluent into a flowing stream = 10,978 cfs, based on information from the National Weather Service or Army Corps of Engineers for the Rock River.
  - b. Gaseous:
    - 1. Number of batch releases = 173
    - 2. Total time period for batch releases = 86,226 minutes
    - 3. Maximum time period for a batch release = 32,301 minutes.
    - 4. Average time period for batch releases = 498 minutes.
    - 5. Minimum time period for a batch release = 30 minutes.
6. Abnormal Releases:
- a. Liquid - none
  - b. Gaseous - none

BYRON NUCLEAR POWER STATION  
 UNIT 1 DOCKET NUMBER SW-50-454  
 EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June 1993

## GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
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## A. FISSION AND ACTIVATION GAS RELEASES

1. Total Release Activity

Ci	3.18E+1	4.86E-1		
uCi/sec	1.69E+3	1.31E+1		

 2. Maximum Release Rate  
for Quarter

3. % of 10CFR20 Limits\*

a. Whole Body (500 mrem/yr)

%	0.03	0.00		
%	0.02	0.00		

b. Skin (3000 mrem/yr)

4. % of 10CFR50 Limits

a. Gamma Quarterly (5 mrad)

%	0.00	0.00		
%	0.00	0.00		
%	0.00	0.00		
%	0.00	0.00		

b. Beta Quarterly (10 mrad)

c. Gamma Annual (10 mrad)

d. Beta Annual (20 mrad)

## B. IODINE RELEASES\*\*

1. Total I-131/I-133 Activity

Ci	3.13E-4	< LLD		
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## C. PARTICULATE (&gt;8 day half-life) RELEASES\*\*

1. Gross Activity

Ci	< LLD	< LLD		
Ci	< LLD	< LLD		

 2. Gross Alpha Activity  
for Quarter

## D. TRITIUM RELEASES\*\*

1. Total Release Activity

Ci	5.46E-2	3.39E-2		
----	---------	---------	--	--

\* % of 10CFR20 limits is based on the maximum release rate for the period considered.

\*\* Iodine, particulate, and tritium % of 10CFR20/10CFR50 limits are expressed as a total limit. See step E.

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APR 26 1993

BEP 1100-T7  
Revision 1

BYRON NUCLEAR POWER STATION  
UNIT 1 DOCKET NUMBER STE-50-454  
EFFLUENT AND WASTE DISPOSAL REPORT

January 1993 THROUGH June 1993

GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

E. SUM OF IODINE, PARTICULATE (>8 day half-life), AND TRITIUM RELEASES

1. Total Activity

Ci	5.49E-2	3.39E-2		
----	---------	---------	--	--

2. % of 10CFR20 Limit

a. Any Organ (1500 mrem/yr)

%	0.00	0.00		
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3. % of 10CFR50 Limit

a. Quarterly Any Organ  
(7.5 mrem)

%	0.00	0.00		
---	------	------	--	--

b. Annual Any Organ  
(15.0 mrem)

%	0.00	0.00		
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GASEOUS EFFLUENTS - VENT STACK RELEASES - BATCH MODE

F. FISSION AND ACTIVATION GAS RELEASES

Xe-131m
Xe-133m
Xe-135m
Xe-133
Xe-135
Kr-85m
Kr-85
Kr-87
Kr-88
Ar-41

Ci	2.56E-1	6.03E-3		
Ci	1.84E-1	1.66E-3		
Ci	< LLD	< LLD		
Ci	3.04E+1	1.44E-1		
Ci	7.79E-2	8.43E-3		
Ci	1.91E-4	1.83E-4		
Ci	6.87E-1	2.23E-1		
Ci	< LLD	< LLD		
Ci	< LLD	< LLD		
Ci	4.57E-3	8.14E-5		
Ci				
Ci				

BYRON NUCLEAR POWER STATION  
UNIT 1 DOCKET NUMBER STN-50-454  
EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

GASEOUS EFFLUENTS - VENT STACK RELEASES - BATCH MODE (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

## G. IODINE RELEASES

I-131  
I-133  
I-135

CI	*	*		
CI	*	*		
CI	*	*		

## H. PARTICULATE (&gt;8 day half-life) RELEASES

Sr-89  
Sr-90

CI	*	*		
CI	*	*		
CI				
CI				
CI				

\* Value reported as continuous release mode.

GASEOUS EFFLUENTS - VENT STACK RELEASES - CONTINUOUS MODE

## F. FISSION AND ACTIVATION GAS RELEASES

Xe-131m  
Xe-135m  
Xe-133  
Xe-135  
Kr-85m  
Kr-85  
Kr-88  
Ar-41

CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	4.02E0	1.02E-1		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		

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BYRON NUCLEAR POWER STATION  
UNIT 1 DOCKET NUMBER STN-50-454EFFLUENT AND WASTE DISPOSAL REPORT  
January, 1993 THROUGH June, 1993GASEOUS EFFLUENTS - VENT STACK RELEASES - CONTINUOUS MODE (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

## J. IODINE RELEASES

I-131

I-133

I-135

CI	2.78E-4	< LLD		
CI	3.51E-5	< LLD		
CI	< LLD	< LLD		

## K. PARTICULATE (&gt;8 day half-life) RELEASES

Sr-89

Sr-90

CI	< LLD	*		
CI	< LLD	*		
CI				
CI				
CI				

\* Analysis done by offsite vendor. Results not available.

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

## F. FISSION AND ACTIVATION GAS RELEASES

## 1. Total Activity Released

CI	1.95E-1	5.40E-2		
uCi/ml	7.86E-8	2.08E-8		

2. Average Concentration  
Released for Quarter

## 3. % of 10CFR50 Limits

- a. Quarterly Whole Body  
(1.5 mrem)
- b. Quarterly Any Organ  
(5.0 mrem)
- c. Annual Whole Body  
(3.0 mrem)
- d. Annual Any Organ  
(10.0 mrem)

%	0.04	0.10		
%	0.09	0.11		
%	0.02	0.06		
%	0.04	0.06		

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BYRON NUCLEAR POWER STATION  
UNIT 1 DOCKET NUMBER STE-50-454  
EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES (CONT)

M. TRITIUM

1. Total Activity Released
2. Average Concentration Released for Quarter
3. % of Limit  
(3.00E-3 uCi/ml)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

Ci	1.93E+2	5.70E+2		
uCi/ml	7.78E-5	2.19E-4		
%	2.59E0	7.30E0		

N. DISSOLVED NOBLE GASES

1. Total Activity Released
2. Average Concentration Released for Quarter
3. % of Limit  
(2.00E-4 uCi/ml)

Ci	9.51E-2	7.36E-3		
uCi/ml	3.83E-8	2.83E-9		
%	1.92E-2	1.42E-3		

O. GROSS ALPHA

1. Total Activity Released
2. Average Concentration Released for Quarter

Ci	<LLD	<LLD		
uCi/ml	0.00	0.00		

P. VOLUME OF WASTE RELEASED

liters	4.29E+6	4.71E+6		
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Q. VOLUME OF DILUTION WATER

liters	2.48E+9	2.60E+9		
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LIQUID EFFLUENTS - CONTINUOUS MODE

R. LIQUID EFFLUENTS

Sr-89

Sr-90

Xe-133

Fe-55

Ci	*	*		
Ci	*	*		
Ci	7.58E-2	<LLD		
Ci	*	*		
Ci				
Ci				

**BYRON NUCLEAR POWER STATION**  
**UNIT 1 DOCKET NUMBER STN-50-454**  
**EFFLUENT AND WASTE DISPOSAL REPORT**

January, 1993 THROUGH June, 1993

**LIQUID EFFLUENTS - WATER MODE**

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

**S. LIQUID EFFLUENTS**

H-3
Cr-51
Mn-54
Fe-55
Co-57
Co-58
Fe-59
Co-60
Zn-65
Br-82
Kr-85
Nb-95
Zr-95
Mo-99
Ru-103
Ru-105
Ag-110m
Sr-113
Sr-117m
Sb-122
Sb-124
Sb-125

C1	1.93E+2	5.70E+2		
C1	1.62E-2	3.45E-3		
C1	4.84E-4	3.60E-4		
C1	< LLD	*		
C1	2.66E-5	1.48E-5		
C1	3.10E-2	2.09E-2		
C1	1.79E-3	6.80E-4		
C1	6.53E-3	4.48E-3		
C1	1.32E-4	2.76E-6		
C1	1.04E-5	< LLD		
C1	< LLD	2.14E-3		
C1	1.13E-3	1.34E-3		
C1	7.26E-4	8.12E-4		
C1	3.89E-5	< LLD		
C1	1.07E-5	< LLD		
C1	1.04E-4	9.97E-5		
C1	2.98E-5	1.76E-4		
C1	8.20E-5	6.69E-5		
C1	4.26E-5	2.25E-6		
C1	1.79E-4	< LLD		
C1	5.96E-3	9.11E-4		
C1	3.95E-2	1.26E-2		

\* Analysis done by offsite vendor. Results not available  
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UNIT 1 DOCKET NUMBER STM-50-454

January 1993 THROUGH June 1993

LIQUID EFFLUENTS - BATH MODE

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
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## S. LIQUID EFFLUENTS

Sb-126

Te-125m

I-131

Xe-131m

Xe-133

Xe-133m

Xe-135

Cs-134

Cs-136

Cs-137

Sr-89

Sr-90

Ba/La-140

[illegible]

\* Analysis done by offsite vendor. Results not available

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BYRON NUCLEAR POWER STATION  
UNIT 2 DOCKET NUMBER STE-50-455EFFLUENT AND WASTE DISPOSAL REPORT  
January 1993 THROUGH June 1993GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

## A. FISSION AND ACTIVATION GAS RELEASES

1. Total Release Activity	Ci	1.70E+1	4.92E-1		
2. Maximum Release Rate for Quarter	uCi/sec	1.69E+3	1.31E+1		
3. % of 10CFR20 Limits*					
a. Whole Body (500 mrem/yr)	%	0.03	0.00		
b. Skin (3000 mrem/yr)	%	0.02	0.00		
4. % of 10CFR50 Limits					
a. Gamma Quarterly (5 mrad)	%	0.00	0.00		
b. Beta Quarterly (10 mrad)	%	0.00	0.00		
c. Gamma Annual (10 mrad)	%	0.00	0.00		
d. Beta Annual (20 mrad)	%	0.00	0.00		

## B. IODINE RELEASES\*\*

1. Total I-131/I-133 Activity	Ci	1.54E-4	<LLD		
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## C. PARTICULATE (&gt;8 day half-life) RELEASES\*\*

1. Gross Activity	Ci	<LLD	<LLD		
2. Gross Alpha Activity for Quarter	Ci	<LLD	<LLD		

## D. TRITIUM RELEASES\*\*

1. Total Release Activity	Ci	9.47E-2	4.61E-2		
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\* % of 10CFR20 limits is based on the maximum release rate for the period considered.

\*\* Iodine, particulate, and tritium % of 10CFR20/10CFR50 limits are expressed as a total limit. See step E.

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ERP 1100-T7  
Revision 1

BYRON NUCLEAR POWER STATION  
UNIT 2 DOCKET NUMBER SN-50-455  
EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

E. SUM OF IODINE, PARTICULATE (>8 day half-life), AND TRITIUM RELEASES

1. Total Activity

Ci	9.48E-2	4.61E-2		
----	---------	---------	--	--

2. % of 10CFR20 Limit

a. Any Organ (1500 mrem/yr)

%	0.00	0.00		
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3. % of 10CFR50 Limit

a. Quarterly Any Organ  
(7.5 mrem)

%	0.00	0.00		
---	------	------	--	--

b. Annual Any Organ  
(15.0 mrem)

%	0.00	0.00		
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GASEOUS EFFLUENTS - VENT STACK RELEASES - BATCH MODE

F. FISSION AND ACTIVATION GAS RELEASES

Xe-131m	Ci	2.23E-1	6.03E-3		
Xe-133m	Ci	7.47E-2	1.66E-3		
Xe-135m	Ci	<LLD	<LLD		
Xe-133	Ci	1.60E+1	2.40E-1		
Xe-135	Ci	1.10E-2	8.71E-3		
Kr-85m	Ci	1.91E-4	1.83E-4		
Kr-85	Ci	6.87E-1	2.23E-1		
Kr-87	Ci	<LLD	<LLD		
Kr-88	Ci	<LLD	<LLD		
Ar-41	Ci	1.75E-2	1.91E-2		
	Ci				
	Ci				



BYRON NUCLEAR POWER STATION  
UNIT 2 DOCKET NUMBER SN-50-455  
EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

GASEOUS EFFLUENTS - VENT STACK RELEASES - BATCH MODE (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

G. IODINE RELEASES

I-131  
I-133  
I-135

CI	*	*		
CI	*	*		
CI	*	*		

H. PARTICULATE (>8 day half-life) RELEASES

Sr-89  
Sr-90

CI	*	*		
CI	*	*		
CI				
CI				
CI				

\* Value reported as Continuous Release Mode.

GASEOUS EFFLUENTS - VENT STACK RELEASES - CONTINUOUS MODE

F. FISSION AND ACTIVATION GAS RELEASES

Xe-131m  
Xe-135m  
Xe-133  
Xe-135  
Kr-85m  
Kr-85  
Kr-88  
Ar-41

CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	4.02E0	1.02E-1		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		
CI	< LLD	< LLD		

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BYRON NUCLEAR POWER STATION  
UNIT 2 DOCKET NUMBER STN-50-455EFFLUENT AND WASTE DISPOSAL REPORT  
January, 1993 THROUGH June, 1993GASEOUS EFFLUENTS - VENT STACK RELEASES - CONTINUOUS MODE (CONT)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

## J. IODINE RELEASES

I-131
I-133
I-135

CI	1.54E-4	<LLD		
CI	<LLD	<LLD		
CI	<LLD	<LLD		

## K. PARTICULATE (&gt;8 day half-life) RELEASES

Sr-89
Sr-90

CI	<LLD	*		
CI	<LLD	*		
CI				
CI				
CI				

\* Analysis done by offsite vendor. Results not available.

LIQUID EFFLUENTS - SUMMARY OF ALL RELEASES

## F. FISSION AND ACTIVATION GAS RELEASES

- Total Activity Released
- Average Concentration Released for Quarter
- % of 10CFR50 Limits
  - Quarterly Whole Body (1.5 mrem)
  - Quarterly Any Organ (5.0 mrem)
  - Annual Whole Body (3.0 mrem)
  - Annual Any Organ (10.0 mrem)

CI	1.95E-1	5.40E-2		
uCi/ml	7.86E-8	2.08E-8		

%	0.04	0.10		
%	0.09	0.11		
%	0.02	0.06		
%	0.04	0.06		

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BRP 1100-T7  
Revision 1

BYRON NUCLEAR POWER STATION  
UNIT 2 DOCKET NUMBER STM-50-455  
EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES (CONT)

M. TRITIUM

1. Total Activity Released
2. Average Concentration Released for Quarter
3. % of Limit  
(3.00E-3 uCi/ml)

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

Ci	1.93E+2	5.70E+2		
uCi/ml	7.78E-5	2.19E-4		
%	2.59E0	7.30E0		

N. DISSOLVED NOBLE GASES

1. Total Activity Released
2. Average Concentration Released for Quarter
3. % of Limit  
(2.00E-4 uCi/ml)

Ci	9.51E-2	7.36E-3		
uCi/ml	3.83E-8	2.83E-9		
%	1.92E-2	1.42E-3		

O. GROSS ALPHA

1. Total Activity Released
2. Average Concentration Released for Quarter

Ci	<LLD	<LLD		
uCi/ml	0.00	0.00		

P. VOLUME OF WASTE RELEASED

liters	4.29E+6	4.71E+6		
--------	---------	---------	--	--

Q. VOLUME OF DILUTION WATER

liters	2.48E+9	2.60E+9		
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LIQUID EFFLUENTS - CONTINUOUS MON

R. LIQUID EFFLUENTS

Sr-89  
Sr-90  
Xe-133  
Fe-55  
            
          

Ci	*	*		
Ci	*	*		
Ci	7.58E-2	<LLD		
Ci	*	*		
Ci				
Ci				

BYRON NUCLEAR POWER STATION  
 UNIT 2 DOCKET NUMBER SYB-50-455

## EFFLUENT AND WASTE DISPOSAL REPORT

January, 1993 THROUGH June, 1993

## LIQUID EFFLUENTS - BATCH MODE

UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR
-------	---------	---------	---------	---------

## S. LIQUID EFFLUENTS

H-3	C1	1.93E+2	5.70E+2		
Cr-51	C1	1.62E-2	3.45E-3		
Mn-54	C1	4.84E-4	3.60E-4		
Fe-55	C1	< LLD	*		
Co-57	C1	2.66E-5	1.48E-5		
Co-58	C1	3.10E-2	2.09E-2		
Fe-59	C1	1.79E-3	6.80E-4		
Co-60	C1	6.53E-3	4.48E-3		
Zn-65	C1	1.32E-4	2.76E-6		
Br-82	C1	1.04E-5	< LLD		
Kr-85	C1	< LLD	2.14E-3		
Nb-95	C1	1.13E-3	1.34E-3		
Zr-95	C1	7.26E-4	8.12E-4		
Mo-99	C1	3.89E-5	< LLD		
Ru-103	C1	1.07E-5	< LLD		
Ru-105	C1	1.04E-4	9.97E-5		
Ag-110m	C1	2.98E-5	1.76E-4		
Sn-113	C1	8.20E-5	6.69E-5		
Sn-117m	C1	4.26E-5	2.25E-6		
Sb-122	C1	1.79E-4	< LLD		
Sb-124	C1	5.96E-3	9.11E-4		
Sb-125	C1	3.95E-2	1.28E-2		

 \* Analysis done by offsite vendor. Results not available  
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APPROVED

January, 1993 **THROUGH** June, 1993

## LIQUID EFFLUENTS - BATCH MODE

## S. LIQUID EFFLUENTS

[illegible]

APPROVED



BYRON NUCLEAR POWER STATION  
UNIT 1/2 DOCKET NUMBER STN-50-454/455  
EFFLUENT AND WASTE DISPOSAL REPORT

January 1993 THROUGH June 1993

SOLID RADIOACTIVE WASTE 1st QUARTER 1993 YEAR

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE, AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME PER SHIPMENT CUBIC FT	CURIES PER SHIPMENT
05 March 1993	Dewatered Resin and DAW, Class A Unstable, Cask, None	Exclusive Use	Barnwell, SC	199.4	2.25
25 March 1993	DAW, Class A, Drums, None	Exclusive Use	Barnwell, SC	622.5	0.95
QUARTERLY TOTALS - NUMBER OF SHIPMENTS: <u>2</u>				821.9	3.20
				CUBIC FT	CURIES

BYRON NUCLEAR POWER STATION  
UNIT 1/2 DOCKET NUMBER STN-50-454/455

EFFLUENT AND WASTE DISPOSAL REPORT  
January 1993 THROUGH June 1993

SOLID RADIOACTIVE WASTE 2nd QUARTER 1993 YEAR

DATE	DISPOSITION OF MATERIAL (DESCRIPTION, CLASS, TYPE, AND SOLIDIFYING AGENT)	MODE OF TRANSPORT	DESTINATION	VOLUME PER SHIPMENT CUBIC FT	CURIES PER SHIPMENT
14 May 1993	Dewatered Resin and DAW Class A Unstable, Cask, None	Exclusive Use	Barnwell, S.C.	199.4	7.00
16 June 1993	Dewatered Resin and DAW Class A Unstable, Cask, None	Exclusive Use	Barnwell, S.C.	199.4	3.60
QUARTERLY TOTALS - NUMBER OF SHIPMENTS: 2				398.8	10.60
				CUBIC FT	CURIES

BYRON NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL REPORT  
JANUARY TO JUNE, 1993

ADDENDUM

A. The following data is the estimated composition of Byron's solid waste.

1. Dry Active Waste (DAW)

H-3	0.48%
C-14	0.14%
Cr-51	32.31%
Mn-54	0.82%
Fe-55	3.85%
Fe-59	0.77%
Co-58	13.99%
Co-60	2.27%
Ni-63	1.13%
Sr-90	<0.01%
Nb-95	34.72%
Zr-95	8.68%
Tc-99	<0.01%
Sn-133	0.31%
I-129	<0.01%
Cs-134	0.11%
Cs-137	0.41%
Pu-238	<0.01%
Pu-239	<0.01%
Pu-241	<0.01%
Am-241	<0.01%
Cm-242	<0.01%
Cm-244	<0.01%

2. Primary Resin

H-3	0.18%
C-14	1.83%
Mn-54	8.12%
Fe-55	38.07%
Co-57	0.56%
Co-58	9.64%
Co-60	25.38%
Ni-63	14.72%
Sr-90	0.07%
Tc-99	<0.01%
Sn-117m	<0.01%
Sb-124	<0.01%
Sb-125	0.86%
Te-125m	<0.01%
I-129	<0.01%
Cs-134	0.19%
Cs-137	0.32%
Pu-238	<0.01%
Pu-239	<0.01%
Pu-241	0.06%
Am-241	<0.01%
Cm-242	<0.01%
Cm-244	<0.01%

3. Radwaste Resin

H-3	0.35%
C-14	0.74%
Cr-51	1.41%
Mn-54	2.63%
Fe-55	19.65%
Co-57	0.25%
Co-58	53.46%
Fe-59	0.10%
Co-60	11.79%
Ni-63	5.97%
Zn-65	0.13%
Sr-90	0.03%
Nb-95	0.15%
Zr-95	0.05%
Mo-99	<0.01%
Tc-99	<0.01%
Sn-113	<0.01%
Sb-124	<0.01%
Sb-125	0.30%
I-129	<0.01%
I-131	0.05%
Cs-134	0.95%
Cs-136	0.01%
Cs-137	1.91%
La-140	<0.01%
Ce-144	0.02%
Hf-181	<0.01%
Pu-238	<0.01%
Pu-239	<0.01%
Pu-241	0.02%
Am-241	<0.01%
Cm-242	<0.01%
Cm-244	<0.01%

B. There were no major changes or modifications to the PCP or to any liquid gaseous or solid radwaste treatment systems for this period. Byron Station continues to utilize the services of Pacific Nuclear for dewatering and solidification services.

C. Error Analysis

The following is an estimate of the errors associated with effluent monitoring and analysis. The estimate is calculated using the square root of the sum of the squares methodology.

(3635z/072793)

1. Gaseous Effluents

Sampling error	= 1 to 3.5%
Calibration error	= 10%
Counting Statistics error	= 5%
Vent Stack Flowrates error	= 1.5%
Total error	= 11 - 12%

2. Liquid Effluents

Sampling error	= 1%
Calibration error	= 10%
Sample volume error	= 1%
Discharged volume error	= 2%
Total error	= 10%

3. Waste Resin

Sampling error	= 5%
Counting Statistics error	= 7%
Weight error	= 1%
Volume error	= 5%
Total error	= 10%

4. DAW

Counting Statistics error	= 7%
Calibration error	= 10%
Weight error	= 2%
Total error	= 12.4%

- D. Meteorological and environmental impact information is reported in the Station Annual Radiological Environmental Operating Report as required by Technical Specifications 6.9.1.6.
- E. No limits were exceeded in liquid hold up tanks as stated in Technical Specifications 3.11.1.4 or in waste gas decay tanks as stated in Technical Specifications 3.11.2.6.
- F. There were no irradiated fuel shipments during this period.
- G. There were no elevated releases. All releases are considered ground level releases.
- H. The Offsite Calculation Manual (ODCM) was revised in January 1993. This revision addressed comments and recommendations provided by the Nuclear Regulatory Commission in their Safety Evaluation Report (SER) and Idaho National Engineering Laboratory in their Technical Evaluation Report (TER). Two primary modifications were made based on the SER/TER. First, in the past Commonwealth Edison calculated doses to adults, children and infants. Commonwealth Edison will now calculate dose for the teenager, also. Inhalation and ingestion values were obtained from Regulatory Guide 1.109. Secondly, the Radiological Effluents and Monitoring Chapter of the ODCM (Chapter 10) was rewritten to specifically reflect how effluent values and setpoints are determined. In addition, the database of meteorological values utilized in ODCM calculations was expanded from about three years to ten years. This enhancement, based on site meteorology, provides a more representative basis.

ATTACHMENT A

BYRON NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL REPORT FOR JANUARY THROUGH JUNE, 1993

UNIT 1 AND 2 (DOCKET NUMBERS 50-454 AND 50-455)

LLD VALUES FOR GASEOUS RELEASES

<u>ISOTOPES</u>	<u>LLD(Ci/ml)</u>
H-3	3.28E-17
Ar-41	1.72E-13
Mn-54	4.57E-19
Fe-59	9.70E-19
Co-58	4.66E-19
Co-60	7.03E-19
Kr-85	3.72E-11
Kr-85m	1.19E-12
Kr-87	3.40E-13
Kr-88	5.07E-13
Y-88	2.22E-18
Sr-89	2.69E-17
Sr-90	9.23E-18
Ru-103	3.84E-19
Ag-110m	7.04E-19
I-131	3.28E-18
I-132	5.35E-19
I-133	5.20E-19
I-134	6.18E-19
I-135	2.09E-19
Xe-131m	5.12E-13
Xe-133	3.00E-13
Xe-133m	1.34E-13
Xe-135	7.91E-13
Xe-135m	1.70E-13
Cs-134	4.58E-19
Cs-136	4.38E-19
Cs-137	4.95E-19
Ba/La-140	2.98E-18
Ce-144	2.03E-18



ATTACHMENT A. (cont.)

BYRON NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL REPORT FOR JANUARY THROUGH JUNE, 1993

UNIT 1 AND 2 (DOCKET NUMBERS 50-454 AND 50-455)

LLD VALUES FOR LIQUID RELEASES

<u>Isotopes</u>	<u>LLD(Ci/ml)</u>
H-3	2.64E-12
Cr-51	2.21E-13
Mn-54	4.57E-19
Fe-55	2.10E-14
Fe-59	5.76E-14
Co-57	1.96E-14
Co-58	3.11E-14
Co-60	4.60E-14
Zn-65	6.56E-14
Br-82	3.44E-14
Kr-85	5.59E-12
Sr-89	2.55E-14
Sr-90	6.60E-15
Nb-95	2.84E-14
Zr-95	5.62E-14
Mo-99	2.21E-13
Ru-103	2.99E-14
Ru-105	5.55E-14
Ag-110m	4.86E-14
Sn-113	3.48E-14
Sn-117m	2.08E-14
Sb-122	3.63E-14
Sb-124	2.77E-14
Sb-125	7.36E-14
Sb-126	2.65E-14
Te-125m	5.60E-12
I-131	1.86E-13
Xe-131m	9.50E-13
Xe-133	5.35E-14
Xe-133m	1.96E-13
Xe-135	2.27E-14
Cs-134	3.20E-14
Cs-136	2.93E-14
Cs-137	3.43E-14
Ba/La-140	2.95E-14
Ce-144	2.03E-18