RLB-90-63

February 26, 1991

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

SUBJECT: Quad Cities Station Operating Report
NRC Dockets (50-254 and 50-265)

Enclosed is the Radioactive Effluent Report for July through December, 1990, for Quad Cities Nuclear Power Station.

The U-1 service water monitor was out of service for 87 days from 10-30-90 to 1-25-91. The monitor was taken out of service to investigate the cause of some spikes on the control room chart recorder. Initial investigation was not able to pinpoint the cause. An Eberline service representative was contacted and contracted to come on-site and assist in the investigation. He suggested that we install a specific capacitor, and the spiking problem would then be rectified. The Instrument Maintenance Department performed this task and tested the system. The problem did not go away. Upon further investigation, two computer boards were found to be bad. These boards were then replaced, and the problem was rectified. The required sampling was performed during this time period to continue releases via this pathway.

A copy of this report will be furnished to the NRC Resident Inspector.

Sincerely,

COMMONWEALTH EDISON
QUAD CITIES NUCLEAR POWER STATION

R. A. Robey for
R. L. Bax
Station Manager

RLB/RAW/vmw

IE46
1/1

Form #

QCP 100-S25
Revision 5
March 1989

EFFLUENT AND WASTE DISPOSAL
SEMI-ANNUAL REPORT July-December 1991
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

PROCEDURE: QCP 100-7

	Unit	Quarter Third	Quarter Fourth	Est. Total Error, %
A. FISSION & ACTIVATION GASES				
1. Total Release	Ci	1.68E01	1.34 E01	12.4
2. Average release rate for period	µCi/sec	2.11E00	1.69 E00	
3. Percent of Tech Spec limit * Chimney & stack	%	1.49E-02 1.44E-03	1.26E-02 5.14E-04	
B. IODINE				
1. Total Iodine-131	Ci	3.13E-03	7.67E-04	31.3
2. Average release rate for period	µCi/sec	3.94E-04	9.65E-05	
C. PARTICULATES				
1. Particulates with half-lives > 8 days	Ci	1.11E-02	1.24E-02	16.8
2. Average release rate for period	µCi/sec	1.40E-03	1.56E-03	
3. Gross alpha radioactivity	Ci	<LLD	<LLD **	
D. TRITIUM				
1. Total Release	Ci	2.99E01	4.17E01	6.24
2. Average release rate for period	µCi/sec	3.76E00	5.25E00	
E. Iodine 131 & 133, Tritium and Particulates				
Percent of Tech spec Limit Chimney & stack	%	1.51E00	2.74E-01	

*NOBLE GAS GAMMA/NOBLE GAS BETA DOSE LIMITS

** projected value based on previous 6 months

APPROVED
JUN 12 1989
Q.C.O.S.R.

MAIN CHIMNEY
GASEOUS EFFLUENTS

Nuclides Released	Unit	Continuous Mode Quarter Third	Continuous Mode Quarter Fourth	Batch Mode Quarter	Batch Mode Quarter
1. Fission gases					
Kr-85	Ci	<LLD	<LLD		
Kr-85m	Ci	2.56E-01	1.71E-02		
Kr-87	Ci	4.83E-01	4.50E-01		
Kr-88	Ci	3.17E-01	2.84E-01		
Xe-133	Ci	1.78E00	4.60E-01		
Xe-135	Ci	4.61E-01	4.23E-01		
Xe-135m	Ci	2.49E00	2.26E00		
Xe-138	Ci	1.09E01	9.30E00		
Ar-41	Ci	1.06E-01	2.01E-01		
	Ci				
	Ci				
	Ci				
Total for Period	Ci	1.68E01	1.15E01		
2. Iodines					
I-131	Ci	5.55E-04	6.02E-04		
I-133	Ci	1.62E-03	1.99E-03		
I-135	Ci	5.[illegible]E-04	1.63E-03		
Total for Period	Ci	2.69E-03	4.22E-03		

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MAIN CHIMNEY
GASEOUS EFFLUENTS

Nuclides Released	Unit	Continuous Mode Quarter Third	Continuous Mode Quarter Fourth	Batch Mode Quarter	Batch Mode Quarter
3. Particulates					
Sr-89 *	Ci	7.11E-04	1.51E-04		
Sr-90 *	Ci	5.94E-07	8.68E-07		
Cs-134	Ci	<LLD	<LLD		
Cs-137	Ci	<LLD	<LLD		
Ba-140	Ci	2.69E-04	1.13E-04		
La-140	Ci	5.66E-04	4.40E-04		
Cr-51	Ci	<LLD	1.02E-04		
Mn-54	Ci	<LLD	<LLD		
Co-58	Ci	<LLD	<LLD		
Co-60	Ci	4.13E-05	1.13E-04		
I-131	Ci	<LLD	1.65E-04		
Ag-110m	Ci	<LLD	<LLD		
Mo99	Ci	5.50E-05	1.03E-04		
I133	Ci	1.86E-04	8.31E-04		
I135	Ci	<LLD	1.33E-03		
Fe59	Ci	<LLD	1.29E-05		
	Ci				
Total for Period	Ci	1.83E-03	3.36E-03		

* Projected value based on last six months available data

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JUN 12 1989
Q.C.O.S.R.

REACTOR VENTILATION
GASEOUS EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter Third	Quarter Fourth	Quarter	Quarter
1. Fission gases					
Kr-85	Ci	<LLD	<LLD		
Kr-85m	Ci	<LLD	<LLD		
Kr-87	Ci	<LLD	<LLD		
Kr-88	Ci	<LLD	<LLD		
Xe-133	Ci	<LLD	<LLD		
Xe-135	Ci	<LLD	<LLD		
Xe-135m	Ci	<LLD	<LLD		
Xe-138	Ci	<LLD	<LLD		
	Ci	<LLD	<LLD		
	Ci	<LLD	<LLD		
Total for Period	Ci	<LLD	<LLD		
2. Iodines					
I-131	Ci	2.57E-03	<LLD		
I-133	Ci	1.22E-03	6.17E-05		
I-135	Ci	1.62E-03	<LLD		
Total for Period	Ci	5.41E-03	6.17E-05		

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JUN 12 1989
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REACTOR VENTILATION
GASEOUS EFFLUENTS

Nuclides Released	Unit	Continuous Mode Quarter Third	Continuous Mode Quarter Fourth	Batch Mode Quarter	Batch Mode Quarter
3. Particulates					
Sr-89 *	Ci	7.09E-06	1.44E-05		
Sr-90 *	Ci	1.00E-06	6.37E-07		
Cs-134	Ci	<LLD	<LLD		
Cs-137	Ci	<LLD	6.90E-05		
Ba-140	Ci	<LLD	<LLD		
La-140	Ci	3.54E-05	<LLD		
Cr-51	Ci	5.04E-03	3.98E-03		
Mn-54	Ci	2.05E-04	1.78E-03		
Co-58	Ci	1.10E-04	2.01E-04		
Co-60	Ci	1.29E-03	2.19E-03		
I-131	Ci	<LLD	<LLD		
Ag-110m	Ci	<LLD	<LLD		
Zn65	Ci	<LLD	1.87E-05		
Mo99	Ci	2.11E-03	7.83E-04		
I133	Ci	3.92E-05	<LLD		
I135	Ci	4.31E-04	<LLD		
	Ci	<LLD	<LLD		
Total for Period	Ci	9.27E-03	9.04E-03		

* Projected value based on last six months available data

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JUN 12 1989
Q.C.O.S.R.

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter Third	Quarter Fourth	Est. Total Error, %
A. FISSION & ACTIVATION PRODUCTS				
1. Total release (not including tritium, gases, alpha)	Ci	3.14E-03	5.58E-03	4.4
2. Average diluted concentration during batch dischargesr period	µCi/ml	3.62E-09	1.47E-09	
3. Percent of applicable limit *	%	8.85E-03 4.20E-03	9.90E-03 4.38E-03	
4. Maximum diluted concentration during batch discharges	µCi/ml	3.78E-09	7.12E-09	
B. TRITIUM				
1. Total release	Ci	1.15E-01	2.92E00	6.1
2. Average diluted concentration during batch discharges	µCi/ml	1.32E-07	7.70E-07	
3. Percent of applicable limit	%	4.40E-03	2.57E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. Total release	Ci	<LLD	6.59E-04	4.4
2. Average diluted concentration during batch discharges	µCi/ml	<LLD	1.74E-10	
3. Percent of applicable limit	%	0.00E00	8.69E-05	
D. GROSS ALPHA RADIOACTIVITY				
1. Total Release	Ci	<LLD	1.94E-05	14.9
2. Average concentration released during batch discharges	µCi/ml	<LLD	5.12E-12	
E. VOLUME OF WASTE RELEASED (prior to dilution	Liters	1.08E 05	6.03E 05	
F. VOLUME OF DILUTION WATER USED DURING BATCH DISCHARGES	Liters	8.68E 08	3.79E 09	
G. TOTAL VOLUME OF DILUTION WATER DURING PERIOD (QUARTER)	Liters	5.08E 11	2.48E 11	

*WHOLE BODY/ORGAN

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JUN 12 1989
O.C.O.S.R.

LIQUID EFFLUENTS

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter	Quarter	Quarter Third	Quarter Fourth
Sr-89 *	C1	<LLD	<LLD	1.62E-05	2.78E-05
Sr-90 *	C1	<LLD	<LLD	2.38E-06	5.73E-06
Cs-134	C1	<LLD	<LLD	<LLD	<LLD
Cs-137	C1	<LLD	<LLD	1.62E-04	1.88E-04
I-131	C1	<LLD	<LLD	<LLD	<LLD
Co-58	C1	<LLD	<LLD	1.41E-04	6.83E-05
Co-60	C1	<LLD	<LLD	2.17E-03	3.41E-03
Fe-59	C1	<LLD	<LLD	<LLD	<LLD
Zn-65	C1	<LLD	<LLD	2.17E-04	<LLD
Mn-54	C1	<LLD	<LLD	1.08E-04	6.48E-04
Cr-51	C1	<LLD	<LLD	8.34E-05	8.30E-04
Zr-95	C1	<LLD	<LLD	<LLD	<LLD
Nb-95	C1	<LLD	<LLD	<LLD	<LLD
Mo-99	C1	<LLD	<LLD	<LLD	<LLD
Ag-110m	C1	<LLD	<LLD	<LLD	<LLD
Ba-104	C1	<LLD	<LLD	<LLD	<LLD
Cs-136	C1	<LLD	<LLD	<LLD	<LLD
La-140	C1	<LLD	<LLD	<LLD	<LLD
Fe-55 *	C1	<LLD	<LLD	2.38E-04	3.75E-04
Unidentified As-76	C1	<LLD	<LLD	<LLD	3.17E-05
Total for Period (above)	C1	<LLD	<LLD	3.14E-03	5.58E-03
Xe-133	C1	<LLD	<LLD	<LLD	2.03E-04
Xe-135	C1	<LLD	<LLD	<LLD	4.56E-04

Prepared by _____ Approved by Paul B Schum
Chemistry Supervisor

APPROVED
JUN 12 1989
OCOSR

* Scaled in value based on last six months available data.

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

Supplemental Information

Facility Quad Cities Nuclear Power Station

Licensee Commonwealth Edison Company

1. Regulatory Limits

a. For Noble Gases:

Dose rate

1. Less than 500 mrem/year to the whole body.
2. Less than 3000 mrem/year to the skin.

Dose Gamma Radiation

1. Less than or equal to 5 mrad/quarter.
2. Less than or equal to 10 mrad/year

Beta Radiation

1. Less than or equal to 10 mrad/quarter.
2. Less than or equal to 20 mrad/year.

b.,c. For Iodine-131, for Iodine-133, and for all radionuclides in particulate form with half-lives greater than 8 days

Dose Rate

1. Less than 1500 mrem/year

Dose

1. Less than or equal to 7.5 mrem/quarter
2. Less than or equal to 15 mrem/year.

d. For Liquid:

Less than or equal to 3 mrem to the whole body during any calendar year.

Less than or equal to 10 mrem to any organ during any calendar quarter.

Less than or equal to 6 mrem to the whole body during any calendar year.

Less than or equal to 20 mrem to any organ during any calendar year.

2. Maximum Permissible Concentration

a.,b.,c. For fission and activation gases, iodines, and particulates with halflives greater than 8 days, allowable release limits are calculated by solving equations 10.1 and 10.2 from the Offsite Dose Calculation Manual. The alarm setpoint is one half of the most conservative value from the two equations.

d. For liquid effluents allowable release limits are calculated by solving equation 10.3 from the Offsite Dose Calculation manual. The MPC values used for the monitors were as follows:

radwaste discharge 4.46 E-05 uCi/ml
service water 2.0E-05 uCi/ml

3. Average Energy

The average gamma energy used to calculate the alarm setpoints for the noble gas monitors was 0.339 Mev for the Third quarter and 0.580 Mev for the Fourth quarter.

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases:
b. Iodines:
c. Particulates:

The main chimney and reactor building ventilation exhaust systems are continually monitored for iodines and particulates. These samples are pulled every 7 days and analyzed by gamma isotopic. The particulate papers are composited every 31 days and sent to a vendor for Sr 89-90 and gross alpha analysis. Noble gas grab samples are pulled and analyzed by gamma isotopic every 7 days. Tritium samples are pulled and analyzed every 31 days.

The continuous strip chart recorders for the monitors on the release points are reviewed monthly for spikes and the activity released is calculated. An additional calculated activity for noble gases is added to the Main Chimney release each month. This calculation is done because most of the grab samples show less than the lower limit of detection due to the low amount of activity and the large dilution flow at the sample point. The calculation takes into account the normal offgas train and the gland steam contribution to the release.

The average flow at the release points are used to calculate the curies released.

d. Liquid Effluents

The river discharge tanks are analyzed before discharge by gamma isotopic. A composite sample is taken during discharge. This is composited with other discharges that occurred every 31 days and is analyzed for tritium and gross alpha. The batch composites are composited quarterly and sent to a vendor for Sr 89-90 and Fe 55. The discharge bay is sampled every 31 days and analyzed by gamma isotopic, for tritium and gross alpha. It is sampled quarterly and sent to a vendor for Sr 88-90 and Fe 55 analysis.

The tank volumes and activities are used to calculate the curies released for the river discharge tank. The total water released during the quarter and the activity is used to calculate the curies released for the discharge bay.

e. Estimated Total Error Percent

The estimated total error percents were calculated by taking the square root of the sum of the squares of errors for sampling and measurement parameters.

f. Less than the lower limit of detection (<LLD).

Samples are analyzed such that the Technical Specification LLD requirements are met. When a nuclide is not detected during the a quarter then <LLD is reported.

5. Batch Releases

a. Liquid

1. number of releases 5
2. total time 3.02E03 minutes
3. maximum time 8.93E02 minutes
4. average time 6.05E02 minutes
5. minimum time 4.60E02 minutes
6. average stream flow, discharge 6.21E01 gpm, dilution 3.97E05 gpm.

b. Gaseous

NONE

6. Abnormal Releases

a. Liquid

NONE

b. Gaseous

NONE

CECo QUAD CITIES STATION
296 ft. WIND SPEED and WIND DIRECTION

July-September 1990
296-33 ft. DIFFERENTIAL TEMPERATURE

NUMBER OF OBSERVATIONS : 2208
VALUES ARE PERCENT OCCURRENCE

SPEED	WIND DIRECTION CLASSES																STABILITY CLASSES							
CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		.00						
C SU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			.00					
A N	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00				.00				
L SS	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00					.00			
M MS	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00						.00		
ES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							.00	
																									.00
EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		.00						
1 SU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.09			.09					
- N	.09	.09	.09	.00	.00	.05	.05	.05	.18	.09	.18	.18	.14	.05	.09	.00	1.31				1.31				
3 SS	.09	.05	.00	.00	.05	.00	.00	.14	.05	.00	.05	.18	.00	.00	.09	.09	.77					.77			
MS	.00	.00	.00	.00	.14	.00	.00	.05	.00	.00	.00	.05	.05	.00	.09	.00	.38						.38		
ES	.00	.00	.00	.00	.10	.00	.00	.09	.05	.00	.00	.00	.00	.00	.00	.00	.14							.14	
																									2.67
EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.09	.05	.09	.09	.41	.41							
MU	.05	.09	.09	.05	.05	.00	.05	.05	.00	.14	.09	.05	.14	.18	.32	.09	1.41		1.41						
4 SU	.14	.05	.05	.05	.32	.05	.18	.23	.05	.54	.27	.14	.27	.14	.18	.05	2.67			2.67					
- N	.41	.45	.50	.86	.54	.23	.23	.32	.18	.68	1.00	.36	.32	.41	.59	.41	7.48				7.48				
7 SS	.23	.27	.54	.41	.14	.23	.32	.27	.41	.36	.73	.14	.41	.45	.23	.36	5.49					5.49			
MS	.00	.05	.00	.09	.05	.09	.32	.14	.41	.14	.27	.18	.09	.18	.09	.05	2.13						2.13		
ES	.05	.05	.00	.00	.09	.05	.05	.00	.14	.05	.59	.18	.09	.00	.00	.00	1.31							1.31	
																									20.90
EU	.09	.09	.00	.00	.00	.00	.00	.00	.05	.00	.09	.09	.36	.05	.27	.18	1.27	1.27							
MU	.05	.09	.14	.27	.18	.18	.18	.36	.14	.14	.23	.23	.14	.09	.00	.32	2.72		2.72						
8 SU	.18	.18	.09	.23	.14	.14	.36	.27	.23	.45	.23	.18	.05	.09	.14	.32	3.26			3.26					
- N	.82	1.00	.86	.68	.23	.32	.68	1.09	.36	1.09	1.27	.54	.05	.23	.41	.86	10.47				10.47				
1 SS	.54	.63	1.13	.91	.86	.50	.63	1.09	.82	1.09	1.45	.18	.27	.18	.54	.59	11.42					11.42			
2 MS	.05	.09	.32	.41	.23	.41	.59	.73	.73	1.13	.54	.05	.09	.23	.18	.09	5.85						5.85		
ES	.00	.00	.00	.05	.00	.00	.18	.45	.32	.05	.26	.27	.00	.00	.00	.00	1.68							1.68	
																									38.67
EU	.05	.14	.00	.00	.00	.00	.00	.05	.05	.14	.18	.00	.00	.00	.18	.14	.91	.91							
1 MU	.09	.27	.14	.05	.23	.00	.14	.23	.32	.05	.05	.09	.14	.05	.05	.00	1.72		1.72						
3 SU	.27	.14	.09	.05	.05	.00	.00	.18	.18	.50	.14	.14	.00	.09	.05	.05	1.90			1.90					
- N	.54	.53	.77	.59	.14	.09	.27	1.31	.54	1.13	.59	.45	.09	.14	.86	.32	8.43				8.43				
1 SS	.73	.73	.86	.50	.63	.63	1.22	1.50	1.41	2.13	1.50	.23	.41	.50	.63	.95	14.10					14.10			
8 MS	.05	.09	.09	.14	.09	.32	.45	1.22	.63	1.13	.23	.36	.41	.54	.09	.05	5.94						5.94		
ES	.00	.00	.00	.00	.05	.05	.14	.18	.32	.23	.00	.00	.09	.00	.05	.18	1.27							1.27	
																									24.27

CECo QUAD CITIES STATION
296 ft. WIND SPEED and WIND DIRECTION

July-September 1990
296-33 ft. DIFFERENTIAL TEMPERATURE

SPEED	WIND DIRECTION CLASSES																STABILITY CLASSES							
CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.09	.00	.14	.14							
1 MU	.00	.00	.05	.00	.00	.00	.00	.05	.05	.00	.00	.00	.00	.09	.09	.00	.32		.32						
3 SU	.00	.05	.09	.00	.00	.00	.00	.09	.05	.00	.00	.00	.00	.09	.18	.00	.54			.54					
~ N	.05	.05	.22	.00	.05	.00	.00	.45	.09	.14	.09	.00	.00	.05	.50	.05	1.72				1.72				
2 SS	.00	.00	.27	.00	.00	.05	.09	.09	.27	.72	.05	.05	.00	.00	.00	.09	1.77					1.77			
4 MS	.00	.00	.00	.00	.00	.00	.00	.00	.05	.05	.00	.05	.05	.09	.05	.00	.32						.32		
ES	.00	.00	.00	.00	.00	.00	.00	.09	.00	.05	.00	.00	.00	.05	.00	.09	.18							.18	
																									4.99
EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
6 MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.05		.05						
7 SU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			.00					
N	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.23	.00	.32				.32				
2 SS	.00	.00	.00	.00	.00	.00	.00	.05	.05	.00	.00	.00	.05	.00	.00	.00	.14					.14			
4 MS	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00						.00		
ES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							.00	
																									.50
TOT	4.63	5.21	8.21	5.30	4.08	3.35	8.12	10.74	8.11	12.28	10.15	4.53	3.49	4.13	6.35	5.39	100.00	2.72	8.21	8.48	29.74	33.68	14.60	4.58	100.00

Wind Direction by Stability

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-STABILITY CLASSES-
.14	.23	.00	.00	.00	.00	.00	.09	.09	.14	.27	.18	.45	.09	.63	.41	2.72	Extremely Unstable
.18	.45	.41	.36	.32	.18	.36	.68	.50	.32	.36	.36	.41	.45	.45	.41	5.21	Moderately Unstable
.59	.41	.32	.32	.50	.18	.64	.77	.50	1.50	.63	.54	.32	.41	.54	.41	8.48	Slightly Unstable
1.90	2.18	2.45	2.13	.95	.68	1.22	3.22	1.36	3.13	3.13	1.54	.59	.95	2.67	1.63	29.74	Neutral
1.59	1.68	2.63	1.81	1.68	1.41	2.27	3.13	2.99	4.40	2.76	.77	.86	1.13	1.50	2.09	33.68	Slightly Stable
.09	.23	.41	.63	.50	.82	1.36	2.13	1.86	2.45	1.04	.68	.68	1.04	.50	.18	14.60	Moderately Stable
.05	.05	.00	.05	.14	.09	.36	.73	.82	.36	.95	.45	.18	.05	.05	.27	4.58	Extremely Stable

Wind Direction by Wind Speed

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-WIND SPEED CLASSES-
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	C A L M
.18	.14	.09	.00	.18	.05	.05	.32	.27	.09	.23	.50	.18	.05	.27	.09	2.67	0.9 - 3.5 mph
.86	.95	1.18	1.45	1.18	.82	1.13	1.00	1.18	1.90	2.95	1.13	1.41	1.41	1.50	1.04	20.90	3.6 - 7.5 mph
1.72	2.09	2.54	2.54	1.63	1.54	2.63	3.99	2.63	3.94	4.17	1.54	.95	.86	1.54	2.36	36.67	7.5 - 12.5 mph
1.72	1.95	1.77	1.31	1.04	1.09	2.22	4.67	3.49	5.30	2.67	1.27	.86	1.31	1.90	1.68	34.27	12.6 - 18.5 mph
.05	.09	.63	.00	.05	.05	.09	.73	.50	1.04	.14	.09	.05	.36	.91	.23	4.99	18.6 - 24.5 mph
.00	.00	.00	.00	.00	.00	.00	.05	.05	.00	.00	.00	.05	.14	.23	.00	.50	> 24.5 mph

CECo QUAD CITIES STATION
296 ft. WIND SPEED and WIND DIRECTION

October-December 1990
296-33 ft. DIFFERENTIAL TEMPERATURE

NUMBER OF OBSERVATIONS = 2184
VALUES ARE PERCENT OCCURRENCE

SPEED		WIND DIRECTION CLASSES																STABILITY CLASSES							
CLASS		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
	EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
	MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		.00						
C	SU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			.00					
A	N	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00				.00				
L	SS	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00					.00			
M	MS	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05						.05		
	ES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							.00	
																										.05
	EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
	MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		.00						
1	SU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			.00					
-	N	.05	.00	.05	.00	.00	.09	.00	.00	.05	.05	.00	.00	.19	.09	.09	.05	.70				.70				
J	SS	.09	.05	.05	.00	.00	.00	.05	.00	.05	.09	.09	.05	.00	.00	.00	.00	.51					.51			
	MS	.09	.00	.00	.05	.05	.00	.00	.05	.00	.00	.05	.00	.00	.05	.00	.05	.37						.37		
	ES	.00	.05	.00	.05	.00	.00	.00	.05	.01	.05	.09	.00	.05	.00	.05	.00	.42							.42	
																										2.00
	EU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.05	.05							
	MU	.00	.05	.00	.00	.00	.00	.00	.00	.00	.05	.05	.00	.00	.14	.09	.00	.37		.37						
4	SU	.00	.05	.05	.00	.00	.00	.00	.00	.00	.19	.05	.00	.05	.05	.09	.09	.80			.80					
-	N	.09	.14	.05	.00	.05	.28	.23	.23	.09	.51	.37	.19	.37	.28	.32	.46	3.67				3.67				
7	SS	.09	.05	.05	.05	.05	.00	.00	.05	.09	.14	.19	.05	.05	.19	.00	.09	1.11					1.11			
	MS	.05	.05	.00	.00	.00	.14	.09	.09	.09	.05	.14	.09	.09	.00	.09	.05	1.02						1.02		
	ES	.05	.09	.00	.00	.00	.00	.05	.19	.09	.23	.46	.00	.05	.05	.05	.05	1.35							1.35	
																										8.17
	EU	.00	.00	.00	.00	.00	.00	.00	.00	.14	.05	.05	.05	.00	.05	.00	.00	.32	.32							
	MU	.00	.00	.00	.00	.00	.00	.00	.05	.14	.19	.09	.05	.23	.00	.23	.00	.97		.97						
8	SU	.00	.00	.00	.05	.00	.14	.05	.05	.05	.28	.19	.14	.05	.09	.14	.09	1.30			1.30					
-	N	.05	.00	.23	.19	.05	.28	1.11	.79	.80	.46	.70	.93	1.11	.97	1.44	.42	9.33				9.33				
1	SS	.19	.05	.09	.14	.14	.19	.19	.46	.32	.93	1.25	.19	.27	.46	.23	.23	5.43					5.43			
2	MS	.14	.00	.19	.14	.23	.05	.19	.19	.19	.28	.19	.19	.46	.23	.23	.32	3.20						3.20		
	ES	.09	.14	.00	.14	.00	.00	.05	.32	.28	.37	.51	.05	.00	.00	.00	.00	1.95							1.95	
																										22.52
	EU	.00	.00	.00	.00	.00	.00	.00	.14	.19	.09	.05	.05	.00	.09	.32	.00	.93	.93							
1	MU	.05	.00	.00	.00	.00	.00	.05	.09	.23	.09	.09	.09	.05	.09	.37	.05	1.25		1.25						
3	SU	.00	.00	.00	.00	.00	.00	.00	.05	.14	.05	.28	.14	.14	.14	.56	.05	1.53			1.53					
-	N	.93	1.25	1.02	.14	.19	.65	1.25	.79	.42	.79	1.30	.60	1.25	1.81	2.02	.84	16.25				16.25				
1	SS	.28	.00	.09	.37	.32	.23	.51	1.02	.74	1.35	1.72	.65	1.62	1.02	1.02	.23	11.19					11.19			
8	MS	.09	.32	.14	.14	.23	.19	.65	.65	.56	.74	.05	.14	.37	.32	.32	.42	5.34						5.34		
	ES	.23	.00	.00	.05	.00	.00	.14	.70	.88	.93	.32	.00	.00	.00	.00	.09	3.34							3.34	
																										39.83

CECo QUAD CITIES STATION
296 ft. WIND SPEED and WIND DIRECTION

October-December 1990
288-33 ft. DIFFERENTIAL TEMPERATURE

SPEED	WIND DIRECTION CLASSES																STABILITY CLASSES							
CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	.00	.00	.00	.00	.00	.00	.00	.14	.19	.00	.00	.00	.00	.00	.00	.05	.37	.37							
1 MU	.00	.00	.00	.00	.00	.00	.00	.05	.19	.00	.00	.00	.19	.05	.00	.05	.51		.51						
9 SU	.00	.00	.00	.00	.00	.00	.00	.05	.19	.00	.09	.00	.14	.19	.19	.05	.88			.88					
- N	.56	.74	.51	.05	.28	.19	.48	.42	.37	.51	.23	.42	.42	1.44	1.30	.42	8.31				8.31				
2 SS	.05	.09	.00	.00	.23	.00	.32	.37	1.21	3.39	.79	.60	.74	.79	.46	.14	9.19					9.19			
4 MS	.00	.00	.00	.00	.00	.09	.14	.19	.09	.51	.00	.09	.05	.05	.00	.00	1.21						1.21		
ES	.00	.00	.00	.00	.00	.05	.05	.05	.00	.09	.05	.00	.00	.00	.00	.00	.28							.28	
																									30.75
EU	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.05	.05							
G MU	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.09		.09						
T SU	.00	.00	.00	.00	.00	.00	.00	.00	.05	.14	.00	.00	.05	.23	.09	.00	.56			.56					
N	.09	.00	.05	.09	.28	.00	.00	.19	.42	.74	.00	.56	.60	.79	.19	.05	4.04				4.04				
2 SS	.00	.05	.00	.05	.00	.00	.00	.05	.37	1.30	.09	.00	.00	.05	.00	.00	1.95					1.95			
4 MS	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00						.00		
ES	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							.00	
																									8.69
TOT	3.25	3.16	2.55	1.67	2.09	2.60	5.67	7.43	8.50	9.62	5.29	8.68	9.80	10.91	4.32	100.00	1.72	2.20	4.87	42.29	29.28	11.19	7.34	100.00	

Wind Direction by Stability

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-STABILITY CLASSES-
.00	.00	.00	.00	.00	.00	.00	.28	.56	.14	.14	.09	.00	.14	.32	.05	1.72	Extremely Unstable
.05	.05	.00	.00	.00	.00	.05	.19	.56	.32	.23	.14	.46	.37	.70	.09	3.20	Moderately Unstable
.00	.05	.05	.05	.00	.14	.05	.14	.42	.65	.60	.28	.42	.70	1.07	.28	4.87	Slightly Unstable
1.76	2.14	1.90	.46	.84	1.49	3.06	2.41	1.95	3.06	2.60	2.69	3.95	5.39	6.36	2.23	42.29	Neutral
.70	.28	.28	.60	.74	.42	1.07	1.95	2.79	7.20	4.13	1.53	2.79	2.51	1.72	.70	29.09	Slightly Stable
.37	.37	.32	.32	.51	.51	1.07	1.16	.93	1.58	.42	.51	.97	.65	.65	.84	11.19	Moderately Stable
.37	.28	.00	.23	.00	.05	.28	1.30	1.30	1.67	1.44	.05	.09	.05	.05	.14	7.34	Extremely Stable

Wind Direction by Wind Speed

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-WIND SPEED CLASSES-
.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	C A L M
.23	.09	.09	.09	.05	.09	.05	.09	.14	.19	.23	.05	.23	.14	.14	.09	2.00	0.3 - 2.5 mph
.28	.42	.14	.05	.09	.42	.37	.56	.37	1.16	1.20	.32	.60	.70	.65	.74	8.17	3.6 - 7.5 mph
.46	.19	.51	.85	.42	.55	1.58	1.86	1.72	2.55	2.97	1.58	2.23	1.81	2.27	1.07	22.52	7.5 - 12.5 mph
1.58	1.58	1.25	.70	.74	1.27	2.60	3.44	2.16	4.04	3.81	1.67	2.44	3.48	5.52	1.67	39.83	12.5 - 16.5 mph
.60	.84	.51	.05	.51	.32	.97	1.25	2.23	4.50	1.16	1.11	1.53	2.51	1.95	.70	20.75	18.5 - 24.5 mph
.09	.05	.05	.14	.28	.00	.00	.23	.88	2.18	.09	.58	.65	1.16	.28	.05	6.69	> 24.5 mph

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

JULY 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
07/05/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	13600.00
07/09/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	14560.00
07/13/90	RAY-TECH	CHANNAHAN	592.50	512.80
07/16/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	34750.00
07/23/90	CHEM NUCLEAR SYSTEMS	CHANNAHAN	205.80	13110.00
07/25/90	KINDRICK TRUCKING	QUADREX	1011.50	64.57
			2427.20	76597.37

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

AUGUST 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
08/06/90	CHEM NUCLEAR SYSTEMS	CHANNAHAN	205.80	22280.00
08/10/90	U.S. ECOLOGY	U.S. ECOLOGY, WA	495.00	5[illegible]87
08/13/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	12700.00
08/20/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	11940.00
			1112.40	37159.87

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

SEPTEMBER 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
09/04/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	38790.00
09/17/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	28810.00
09/24/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	21870.00
			617.40	89470.00

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

OCTOBER 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
10/09/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	20360.00
10/11/90	KINDRICK TRUCKING	QUADREX	1161.50	123.90
10/15/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	9979.00
10/24/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	8988.00
10/31/90	CHEM NUCLEAR SYSTEMS	U.S. ECOLOGY, WA	205.80	876.78
			1984.70	40327.68

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

NOVEMBER 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
11/05/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	8802.00
11/09/90	RAY-TECH	CHANNAHAN	660.00	577.60
11/19/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	16620.00
11/26/90	U.S. ECOLOGY	U.S. ECOLOGY, WA	474.60	760.68
11/29/90	KINDRICK TRUCKING	QUADREX	1067.20	398.20
			2613.40	27158.48

SOLID RADIOACTIVE WASTE SUMMARY

UNITS 1/2

QUAD CITIES STATION

DECEMBER 1990

DATE	CARRIER	SITE	VOLUME	MILLICURIES
12/4/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	83.40	64380.00
12/4/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	83.40	33200.00
12/6/90	KINDRICK TRUCKING	QUADREX	2080.00	22.60
12/6/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	83.40	48440.00
12/13/90	CHEM NUCLEAR SYSTEMS	U.S. ECOLOGY, WA	105.00	1114.59
12/17/90	RAY-TECH	U.S. ECOLOGY, WA	495.00	339.71
12/20/90	CHEM NUCLEAR SYSTEMS	BARNWELL, SC	205.80	67840.00
12/21/90	RAY-TECH	CHANNAHAN	660.00	311.20
12/27/90	KINDRICK TRUCKING	QUADREX	2080.00	2.26
12/27/90	KINDRICK TRUCKING	QUADREX	1131.50	85.83
			7007.50	215736.19