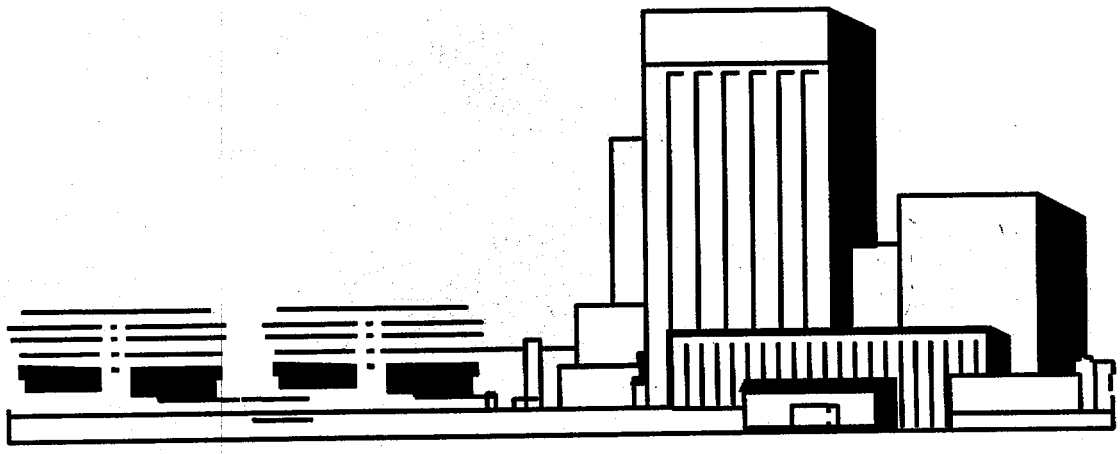
ENERGY NORTHWEST

WNP-2 Radioactive Effluent Release Report

January through December 1999



REFERENCE:
10CFR50.36a(a)(2)

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January Through December 1999

Energy Northwest

License NO. NPF-21

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1.0 Introduction

This report is submitted in compliance with 10CFR50.36a(a)(2) and Technical Specification 5.6.3. It includes a summary of the quantities of radioactive liquid and gaseous effluents and solid radwaste released from WNP-2 during the previous twelve months of operation. Effluent data is summarized on a quarterly basis.

2.0 Liquid Effluents

No radioactive liquids were discharged from WNP-2 during calendar year 1999.

The average flow rate of the Columbia River during January through December 1999 was 1.45E+05 cubic feet per second.

There were no abnormal releases.

During battery surveillance testing, a portion of the 24 VDC system was declared inoperable although it was producing its required output. This system is required for the operability of Standby Service Water radiation monitor SW-RIS-605. Since the 24 VDC system was declared inoperable, the Standby Service Water radiation monitor should have been declared inoperable, and ODCM required compensatory measures should have been initiated. The effect on the operability of this monitor was not recognized at the time, and no compensatory measures were taken. Although the monitor was technically inoperable, it was functioning normally, and would have performed as designed had any abnormal release occurred. The surveillance procedure has been modified to prevent recurrence of this event. (PTL 161942)

The Turbine Service Water effluent monitor was out of service for more than 30 days. This monitor was affected by external electrical noise causing frequent spurious alarms. Investigation of the source of the noise and attempts to shield the monitor from it were unsuccessful. Several noise reduction steps helped reduce the effect of the noise, ultimately reducing the frequency of spurious alarms to an acceptable level. Longer-term efforts are in progress to replace this monitor with newer equipment, which is not as susceptible to this type of problem. (PTL 161704)

Liquid Effluent Tables

Table 2-0 WNP-2 Liquid Effluents -- Dose

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
Number of Batch Releases	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Discharge Duration in Hours					
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Average	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Minimum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Maximum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dilution Flow					
Gallons	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Maximum Individual Dose (mrem)					
Whole Body (Adult)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ODCM Limit	1.5	1.5	1.5	1.5	3.0
% of Limit	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ODCM Limit	5	5	5	5	10
% of Limit	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ODCM Limits

Batch	Less than the concentration specified in 10 CFR 20, Appendix B, Table II, Column 2, and less than 2.0E-04 mCi/cc dissolved or entrained noble gases.
Calendar Quarter	Less than or equal to 1.5 mrem to the total body, and less than or equal to 5 mrem to any organ.
Calendar Year	Less than or equal to 3 mrem to the total body, and less than or equal to 10 mrem to any organ.

Table 2-1 WNP-2 Liquid Effluents -- Summation of all Releases

Report Period: January -- December 1999

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year	Est Total Error* %
A. Fission and activation products						
Total release (not including tritium, gases, alpha) (Ci)	NA	NA	NA	NA	0.00E+00	N/A
Average diluted concentration during period (μCi/ml)	NA	NA	NA	NA	NA	
Percent of MPC limit (%)	NA	NA	NA	NA	NA	
B. Tritium						
Total release (Ci)	NA	NA	NA	NA	0.00E+00	N/A
Average diluted concentration during period (μCi/ml)	NA	NA	NA	NA	NA	
Percent of MPC limit (%)	NA	NA	NA	NA	NA	
C. Dissolved and entrained gases						
Total release (Ci)	NA	NA	NA	N/A	0.00E+00	N/A
Average diluted concentration during period (μCi/ml)	NA	NA	NA	NA	NA	
Percent of limit (%)	NA	NA	NA	NA	NA	
D. Gross alpha radioactivity						
Total release (Ci)	NA	NA	N/A	N/A	0.00E+00	N/A
E.						
Volume of waste prior to dilution (liters)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
F.						
Volume of dilution water used during period (liters)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A

* At 95% confidence level

See Table 2-3 for LLD values.

Table 2-2 WNP-2 Liquid Effluents -- Source Terms

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
A. Fission and activation products					
strontium-89	NA	NA	NA	N/A	0.00E+00
strontium-90	NA	NA	NA	N/A	0.00E+00
cesium-134	NA	NA	NA	N/A	0.00E+00
cesium-137	NA	NA	NA	N/A	0.00E+00
iodine-131	NA	NA	NA	N/A	0.00E+00
cobalt-58	NA	NA	NA	N/A	0.00E+00
cobalt-60	NA	NA	NA	N/A	0.00E+00
iron-59	NA	NA	NA	N/A	0.00E+00
zinc-65	NA	NA	NA	N/A	0.00E+00
manganese-54	NA	NA	NA	N/A	0.00E+00
chromium-51	NA	NA	NA	N/A	0.00E+00
zirconium-niobium-95	NA	NA	NA	N/A	0.00E+00
molybdenum-99	NA	NA	NA	N/A	0.00E+00
technetium-99m	NA	NA	NA	N/A	0.00E+00
barium-lanthanum-140	NA	NA	NA	N/A	0.00E+00
cerium-141	NA	NA	NA	N/A	0.00E+00
cerium-144	NA	NA	NA	N/A	0.00E+00
iron-55	NA	NA	NA	N/A	0.00E+00
Others					
sodium-24	NA	NA	NA	N/A	0.00E+00
Total for period above*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Dissolved and entrained gases					
xenon-133	NA	NA	NA	N/A	0.00E+00
xenon-135	NA	NA	NA	N/A	0.00E+00
C. Tritium					
tritium	NA	NA	NA	N/A	0.00E+00

* Less than (<) values are not included in the totals.
See Table 2-3 for LLD values.

Table 2-3 WNP-2 Liquid Effluents -- LLD

Report Period: January -- December 1999

Fission and Activation Products

Nuclide	LLD(μCi/cc)
strontium-89	2.00E-10
strontium-90	3.60E-09
cesium-134	8.60E-09
cesium-137	9.70E-09
barium-lanthanum-140	7.60E-09
molybdenum-99	1.20E-07
cerium-141	6.10E-09
cerium-144	1.00E-07
cobalt-58	2.50E-09
cobalt-60	5.20E-09
Iron-59	8.10E-09
chromium-51	4.70E-08
manganese-54	3.40E-09
zinc-65	6.20E-09
iodine-131	6.00E-09
iodine-133	2.10E-09
OTHERS	LLD(μCi/cc)
sodium-24	3.70E-09
copper-64	7.40E-07
antimony-124	8.80E-09
antimony-125	4.30E-08

Dissolved and entrained gasses

Nuclide	LLD(μCi/cc)
xenon-133	2.10E-08
xenon-135	5.10E-09

3.0 Gaseous Effluents

The gaseous radwaste effluents from WNP-2 were released from three (3) release points:

1. Main Plant Vent -- mixed mode release
2. Turbine building -- ground level release
3. Radwaste building -- ground level release

The gaseous source terms from each release point are listed in Tables 3-1, 3-2, and 3-3. Table 3-4 provides a summation of the total activity released, the average release rate, the percentage of ODCM Requirement For Operability limit, gross alpha radioactivity and the estimated total error associated with the measurements of radioactivity in the gaseous effluents.

Radioactivity measurements for gaseous effluent releases are performed for fission and activation gases by collecting the samples in a marinelli beaker and analyzing them using gamma spectroscopy. Tritium is analyzed by collecting the sample on a desiccant, distillation, and liquid scintillation counting. Particulates and iodines are sampled using particulate filters and charcoal cartridges. Both are analyzed using gamma spectroscopy. E bar was 0.399 meV per disintegration.

Noble gas activities are commonly below detection limits in the building effluent ducts. When no radioactive noble gas was detected in an effluent duct, a value of zero was used for release and dose calculations.

Calculations were performed for releases using the NRC GASPAR II computer program and parameters as outlined in the ODCM. Quarterly doses to a member of the public were determined at the locations identified in the Annual Land Use Census and at the site boundary.

Table 3-0 summarizes the results of these calculations.

Total error estimates are propagated from individual error estimates of sample volume, sample activity and effluent flow rate measurements. The overriding uncertainty in all cases is in the measurement of the effluent activity and sample volumes. The estimated error was determined to be 36 percent at the 95 percent confidence level.

The percent of ODCM limit for fission and activation gases (air dose) was determined for locations identified in the annual land use census, and was based on quarterly limits of ten (10) millirads for beta and five (5) millirads for gamma. These locations were used to determine the most restrictive value to be used in Table 3-4 for each quarter.

The ODCM limits are listed in Table 3-0.

In addition to the reactor facility, WNP-2 has a permanent laundry facility located approximately 0.75 miles from the reactor building. The laundry facility is not presently being used to launder contaminated materials. Its ventilation system contains HEPA filters on the discharge. Also, the backup chemistry laboratory within the Emergency Operations Facility (EOF) is located near the laundry facility. The radiochemical hood within the backup chemistry lab contains HEPA filters and is monitored for radioactive releases when in operation. Gamma spectrometry indicated no radioactive materials present other than that attributable to natural background.

There were no abnormal releases of gaseous effluent during this reporting period.

The Turbine Building exhaust system isokenetic sample flow controller has been unable to control the sample flow to within an acceptable band for isokenetic sampling when the exhaust system is operating near its design capacity. The error in the sample flow rate is consistently low, producing a conservative bias in the collection of particulates in the exhaust stream. Corrective actions are in progress to improve the operation of the isokenetic flow controller, but are not yet complete. (PTL 161243)

The Turbine Building and the Radwaste Building Intermediate Range Noble Gas Monitors were inoperable for more than 30 days. The instruments were producing a non-linear response due to equipment aging. This equipment is unique to WNP-2. The time required for the purchase of replacement modules and vendor supplied alignment and calibration information caused an extended outage duration. We now have adequate spare parts on hand to prevent recurrence of a similar delay. (PTL 161364)

Gaseous Effluent Tables

Table 3-0 **Dose**

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year
Noble Gas (mrem)					
Gamma Air Dose	1.95E-04	0.00E+00	0.00E+00	0.00E+00	1.95E-04
ODCM Limit	5	5	5	5	10
% of Limit	3.90E-05	0.00E+00	0.00E+00	0.00E+00	1.95E-05
Beta Air Dose	6.89E-05	0.00E+00	0.00E+00	0.00E+00	6.89E-05
ODCM Limit	10	10	10	10	20
% of Limit	6.89E-06	0.00E+00	0.00E+00	0.00E+00	3.45E-06
Iodine-131, Iodine-133, Tritium, and Particulates with half-lives greater than eight days. (mrem)					
Organ Dose	1.47E-03	7.19E-04	7.02E-04	4.03E-04	3.29E-03
ODCM Limit	7.5	7.5	7.5	7.5	15
% of Limit	1.96E-04	9.59E-05	9.36E-05	5.37E-05	2.20E-04

Table 3-1A Source Terms Mixed Mode Releases -- Main Plant Vent

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
A. Fission gases					
krypton-85	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
Others					
argon-41	1.51E+00	<LLD	<LLD	<LLD	1.51E+00
Total for period *	1.51E+00	<LLD	<LLD	<LLD	1.51E+00
B. Iodines					
iodine-131	<LLD	2.21E-05	<LLD	<LLD	2.21E-05
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	<LLD	2.21E-05	<LLD	<LLD	2.21E-05

* Less than (<) values are not included in the totals.
See Table 3-6 for LLD values.

Table 3-1B Mixed Mode Releases -- Main Plant Vent

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
C. Particulates					
strontium-89	2.92E-06	<LLD	4.78E-06	<LLD	7.70E-06
strontium-90	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
molybdenum-99	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-60	<LLD	8.44E-05	7.11E-05	2.96E-05	1.85E-04
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	<LLD	<LLD	<LLD	<LLD
zinc-65	<LLD	<LLD	<LLD	4.07E-05	4.07E-05
Others					
chrome-51	<LLD	<LLD	<LLD	<LLD	
Total for period*	2.92E-06	8.44E-05	7.59E-05	7.03E-05	2.33E-04
Others with T 1/2 < 8 days					
arsenic-76	<LLD	<LLD	<LLD	<LLD	
copper-64	<LLD	<LLD	<LLD	<LLD	
sodium-24	<LLD	<LLD	<LLD	<LLD	
technetium-99m	<LLD	<LLD	<LLD	<LLD	
zinc-69m	<LLD	<LLD	<LLD	<LLD	
Total with T 1/2 < 8 days*	<LLD	<LLD	<LLD	<LLD	<LLD
D. Tritium					
tritium	4.6E-01	3.3E-01	4.4E-01	6.0E-01	1.8E+00

Table 3-2A Source Terms Ground Level Releases -- Turbine Building

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
A. Fission gases					
krypton-85	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
Others					
ar-41	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	<LLD	<LLD	<LLD	<LLD	<LLD
B. Iodines					
iodine-131	<LLD	4.83E-08	<LLD	<LLD	4.83E-08
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	<LLD	4.83E-08	<LLD	<LLD	4.83E-08

* Less than (<) values are not included in the totals.
See Table 3-6 for LLD values.

Table 3-2B Ground Level Releases -- Turbine Building

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
C. Particulates					
strontium-89	4.66E-06	8.44E-07	3.36E-06	1.11E-06	9.97E-06
strontium-90	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
molybdenum-99	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-60	<LLD	2.14E-06	1.42E-06	<LLD	3.56E-06
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	<LLD	<LLD	<LLD	<LLD
zinc-65	<LLD	<LLD	<LLD	<LLD	<LLD
Others					
chrome-51	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period*	4.66E-06	2.99E-06	4.78E-06	1.11E-06	1.35E-05
Others with T 1/2 < 8 days					
NONE	No nuclides with half-lives less than 8 days were identified				
Total with T 1/2 < 8 days*	No nuclides with half-lives less than 8 days were identified				
D. Tritium					
tritium	3.33E+00	7.02E-01	2.20E+00	1.60E+00	7.84E+00

* Less than (<) values are not included in the totals.
See Table 3-6 for LLD values.

Table 3-3A Source Terms Ground Level Releases -- Radwaste Building

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
A. Fission gases					
krypton-85	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-85m	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-87	<LLD	<LLD	<LLD	<LLD	<LLD
krypton-88	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-133m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-135m	<LLD	<LLD	<LLD	<LLD	<LLD
xenon-138	<LLD	<LLD	<LLD	<LLD	<LLD
Others					
NONE					
Total for period *	<LLD	<LLD	<LLD	<LLD	<LLD
B. Iodines					
iodine-131	5.36E-07	1.52E-07	<LLD	<LLD	6.88E-07
iodine-132	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-133	1.96E-05	2.01E-06	3.92E-07	<LLD	2.20E-05
iodine-134	<LLD	<LLD	<LLD	<LLD	<LLD
iodine-135	<LLD	<LLD	<LLD	<LLD	<LLD
Total for period *	2.02E-05	2.16E-06	3.92E-07	<LLD	2.27E-05

* Less than (<) values are not included in the totals.
See Table 3-6 for LLD values.

Table 3-3B Ground Level Releases -- Radwaste Building

Report Period: January -- December 1999

Nuclides Released	1st Quarter (Ci)	2nd Quarter (Ci)	3rd Quarter (Ci)	4th Quarter (Ci)	Year (Ci)
C. Particulates					
strontium-89	2.28E-07	<LLD	1.56E-06	3.54E-07	2.15E-06
strontium-90	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-134	<LLD	<LLD	<LLD	<LLD	<LLD
cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD
barium-lanthanum-140	<LLD	<LLD	<LLD	<LLD	<LLD
molybdenum-99	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-141	<LLD	<LLD	<LLD	<LLD	<LLD
cerium-144	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD
cobalt-60	<LLD	1.24E-06	1.04E-06	<LLD	2.28E-06
iron-59	<LLD	<LLD	<LLD	<LLD	<LLD
manganese-54	<LLD	<LLD	<LLD	<LLD	<LLD
zinc-65	<LLD	<LLD	<LLD	<LLD	<LLD
Others					
NONE	No other nuclides were identified				
Total for period*	2.28E-07	1.24E-06	2.60E-06	3.54E-07	4.43E-06
Others with T 1/2 < 8 days					
NONE	No other nuclides were identified				
Total with T 1/2 < 8 days*	No nuclides with half-lives less than 8 days were identified				
D. Tritium					
tritium	7.65E-02	4.48E-02	1.14E-01	1.09E-01	3.44E-01

* Less than (<) values are not included in the totals.
See Table 3-6 for LLD values.

Table 3-4 Summation of all Gaseous Releases

Report Period: January -- December 1999

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year	Est Total Error*%
A. Fission and activation gases						
Total release (Ci)	1.51E+00	<LLD	<LLD	<LLD	1.51E+00	3.60E+01
Average release rate (μCi/s)	1.94E-01	0.00E+00	0.00E+00	0.00E+00	4.79E-02	
Percent of ODCM limit (%)	**	**	**	**	**	
B. Iodines						
Total I-131 (Ci)	5.36E-07	2.23E-05	<LLD	<LLD	2.28E-05	3.60E+01
Average release rate (μCi/s)	6.81E-08	2.83E-06	<LLD	<LLD	7.23E-07	
Percent of ODCM limit (%)	**	**	**	**	**	
C. Particulates						
Particulates with half-lives >8 days (Ci)	7.81E-06	8.87E-05	8.33E-05	7.17E-05	2.51E-04	3.60E+01
Average release rate (μCi/s)	9.93E-07	1.13E-05	1.05E-05	9.02E-06	7.97E-06	
Percent of ODCM limit (%)	**	**	**	**	**	
Gross alpha radioactivity	4.97E-06	2.98E-06	3.32E-06	5.45E-06	1.67E-05	
D. Tritium						
Total release (Ci)	3.86E+00	1.08E+00	2.75E+00	2.31E+00	1.00E+01	3.60E+01
Average release rate (μCi/s)	4.92E-01	1.37E-01	3.47E-01	2.91E-01	3.18E-01	
Percent of ODCM limit (%)	**	**	**	**	**	

* At 95% confidence level

** ODCM limits are based on dose.
See Table 3-0 for percent of ODCM limits.

Table 3-5 **Gaseous Batch Releases**

Report Period: January -- December 1999

Type	Number	Total Time (hr.)	Maximum Time (hr.)	Minimum Time (hr.)	Mean Time (hr.)
Purge	2.00E+00	7.75E+01	4.92E+01	2.83E+01	3.87E+01
Vent	2.40E+01	1.56E+01	1.33E+01	4.83E-01	6.33E-01

Table 3-6 Gaseous Lower Limit of Detection

Reporting Period: January -- December 1999

Fission Gases

Nuclide	LLD (μCi/cc)
krypton-85	2.60E-07
krypton-85m	3.70E-07
krypton-87	3.00E-09
krypton-88	1.30E-08
xenon-133	1.10E-08
xenon-135	1.32E-09
xenon-135m	4.00E-09
xenon-138	1.20E-08
argon-41	2.60E-09
xenon-137	6.70E-08

Iodines

Nuclide	LLD (μCi/cc)
iodine-131	2.40E-13
iodine-132	3.90E-13
iodine-133	3.50E-13
iodine-134	5.60E-13
iodine-135	1.60E-12

Particulates

Nuclide	LLD (μCi/cc)
strontium-89	5.50E-15
strontium-90	4.20E-15
cesium-134	5.30E-13
cesium-137	3.20E-13
barium-lanthanum-140	1.10E-12
molybdenum-99	3.20E-12
cerium-141	2.30E-13
cerium-144	1.60E-12
cobalt-58	3.20E-13
cobalt-60	6.00E-13
iron-59	1.10E-12
manganese-54	3.70E-13
zinc-65	1.10E-12
Gross Alpha	4.30E-16

4.0 Solid Radwaste

Required by ODCM

Class A

1. Container Volumes

*	B-25 Steel Box	92.5
*	ES-190 Steel Liner	170.2 ft^3
*	Sea Land Container (CVAN)	N/A

2. Total Curies

* 8.20E+01 Ci

3. Principal Radionuclides

Nuclide	Percent	Curies
Co-60	4.25E+01	3.48E+01
Zn-65	2.38E+01	1.95E+01
Mn-54	1.15E+01	9.44E+00
Cr-51	6.97E+00	5.72E+00
Co-58	5.41E+00	4.44E+00
Cs-137	2.94E+00	2.41E+00
Fe-55	2.08E+00	1.70E+00
Ni-63	1.41E+00	1.16E+00
C-14	9.86E-01	8.09E-01
Nb-95	8.69E-01	7.13E-01
Fe-59	5.89E-01	4.83E-01
Zr-95	4.14E-01	3.39E-01
Tc-99	1.31E-01	1.07E-01
Cs-134	1.08E-01	8.84E-02
Sb-125	7.50E-02	6.15E-02

4. Source

*	Resins	6.94E+01 Ci
*	DAW	1.26E+01 Ci
*	Irradiated Components	None
*	Other	None

5. Type of Container

* All containers shipped as LSA, SCO or Radioactive material, n.o.s. in IP-1, IP-2 or Type A (including casks) as appropriate.

6. Solidification Agent

* None

Class B

1. Container Volumes

   * EL-142 Polyethylene HIC 132.4

2. Total Curies

   * 2.44E+02 Ci

3. Principal Radionuclides

Nuclide	Percent	Curies
Co-60	5.57E+01	1.36E+02
Zn-65	2.07E+01	5.04E+01
Cr-51	6.26E+00	1.52E+01
Mn-54	6.15E+00	1.50E+01
Cs-137	4.05E+00	9.88E+00
Co-58	3.89E+00	9.48E+00
Fe-55	2.87E+00	7.00E+00
Ni-63	2.43E-01	5.93E-01
Nb-95	6.50E-02	1.58E-01

4. Source

   * Resins 2.44E+02 Ci
   * DAW None
   * Irradiated Components None
   * Other None

5. Type of Container

   * All containers shipped as LSA or Radioactive material, n.o.s. in Type B casks as appropriate.

6. Solidification Agent

   * None

Class C

None

Required by Reg. Guide 1.21

Table 4-1, WNP-2 Solid Waste Shipments, January -- December, 1999.
Solid waste shipped offsite for burial or disposal.

Waste Stream	Unit	Annual Cumulative	Est. Total Error %
Spent resins, filter sludge, evaporator bottoms, etc.	m^3	6.05E+01	
	Ci	3.13E+02	2.5E+01%
Dry Active Waste	m^3	4.71E+01	
	Ci	1.26E+01	2.5E+01%

Irradiated Components -- None

Other Waste -- None

Estimate of major nuclide composition (by type of waste):

a. Dewatered Spent Resins -- All Classes

Nuclide	%	Curies
Co-60	5.30E+01	1.66E+02
Zn-65	2.13E+01	6.66E+01
Mn-54	7.71E+00	2.41+01
Cr-51	5.72E+00	1.79E+01
Co-58	4.34E+00	1.36E+01
Cs-137	3.82E+00	1.20E+01
Fe-55	2.70E+00	8.46E+00
Ni-63	5.09E-01	1.59E+00
C-14	2.60E-01	8.15E-01
Nb-95	2.26E-01	7.07E-01
Fe-59	1.54E-01	4.83E-01
Zr-95	1.40E-01	4.39E-01
Tc-99	3.50E-02	1.09E-01
Cs-134	2.80E-02	8.84E-02
Sb-125	1.90E-02	5.82E-02

b. Dry Active Waste (DAW) -- All Classes

Nuclide	%	Curies
Co-60	3.78E+01	4.78E+00
Zn-65	2.59E+01	3.27E+00
Cr-51	2.41E+01	3.04E+00
Co-58	2.73E+00	3.45E-01
Cs-137	2.48E+00	3.14E-01
Mn-54	2.32E+00	2.93E-01
Fe-55	1.91E+00	2.41E-01
Nb-95	1.30E+00	1.64E-01
Ni-63	1.25E+00	1.57E-01
H-3	1.19E-01	1.51E-02
C-14	1.02E-01	1.29E-02
Sb-125	2.60E-02	3.25E-03

c. Irradiated Components -- None

d. Other Waste -- None

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
13	Tractor - Trailer via Public Highway	US Ecology, Inc. P.O. Box 638 Hanford Reservation Richland, WA. 99352
10*	Tractor - Trailer via Public Highway	ATG, Inc. 2025 Battelle Blvd. Richland, WA. 99352

*Ten radioactive material shipments were made to a waste processor (ATG) portions of which were sent to US Ecology as waste shipments after the completion of volume reduction activities.

5.0 Meteorology

The meteorological data contained in Tables 5-1 through 5-10 were obtained from the WNP-2 meteorological tower located 2500 ft (762 m) west of WNP-2. Data was recovered from instruments at the 33 ft (10 m) and 245 (75 m) ft levels. The meteorological data is a composite file from the automated data recovery systems for the calendar year 1999. Data is archived on the Energy Northwest Local Area Network.

1999 was the fourth driest year on record. Total precipitation measured at the Hanford Meteorology Station was 3.75 inches (9.53 cm), only 60% of the normal 6.3 inches (15.9 cm). Only trace amounts of snow were measured during January and February and no snowfall was recorded in March. Normal snowfall for the period of January through March is 6.2 inches (15.7 cm). The total snowfall for the November-December period was 0.6 inches, compared to the normal 7.5 inches (19.1 cm). All of which occurred in December.

Calendar year 1999 was slightly warmer than normal, averaging 54.4°F (13.6°C) or 1.1°F (1.6°C) above normal. The warmest day, July 28, had a high temperature of 105°F (40.6°C). The coldest day occurred on January 3, with a low temperature of 18°F (-7.8°C). The occurrence of fog and haze and blowing dust in 1999 was similar to that observed in previous years. In summary, the dispersive environment for WNP-2 for 1999 was near normal.

Joint data recovery for 1999 was 90.4%. The delta T channel was inoperable due to calibration problems from March 30 to May 31. Several other outages of the wind speed and wind direction channels occurred, due either to sensor or recorder problems. Most of these were returned to service within seven days. Lightning strikes and thunderstorms were of minor concern and had no significant effect on meteorological tower operations.

Tables 5-1 through 5-8 list the joint frequency distributions at the 33 ft and 245 ft levels by quarter for 1999. Table 5-9 and 5-10 list the annual joint frequency distributions for those levels for 1999. The NRC stability classes A through G and seven wind categories along with the 16 wind sectors were used to prepare each joint frequency table. The annual joint frequency tables should be used to evaluate any vents and purges during 1999 as the releases were random in time.

Calibrations performed in 1999 required no corrections be applied to the raw data. Data below 0.07 MPH has been determined to result from system malfunction and is not included in the results.

Joint Frequency Distribution Tables

Table 5-1 1st Quarter, 33 FT AGL.

JOINT FREQUENCY DISTRIBUTION FOR THE TIME PERIOD FROM HOUR 00 ON 01/01/99 TO HOUR 23 ON 03/31/99

The total hours are 2160, 1792 hours read and 368 missing.

NRC CATEGORY A

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	0	2	1	0	0
11.25	0	2	0	0	0	0	0
33.75	0	0	2	0	0	0	0
56.25	0	1	0	0	0	0	0
78.75	1	0	0	1	0	1	0
101.25	8	0	1	0	1	0	0
123.75	0	0	1	2	0	0	0
146.25	0	0	0	4	0	0	0
168.75	1	0	2	5	1	2	0
191.25	2	0	1	1	0	1	1
213.75	0	0	0	0	0	0	0
236.25	0	1	0	0	0	0	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	2	0	0	0
303.75	0	0	2	8	2	0	0
326.25	0	1	4	7	0	0	0

NRC CATEGORY B

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	0	0	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	0	0	0	1	0	0
56.25	0	0	1	0	0	0	2
78.75	0	0	0	0	0	0	0
101.25	5	0	0	0	0	0	0
123.75	0	0	1	1	0	0	0
146.25	0	0	0	1	0	0	0
168.75	0	0	2	6	2	0	0
191.25	0	0	0	1	3	0	0
213.75	0	0	0	0	1	2	0
236.25	2	0	0	0	0	0	0
258.75	1	0	0	0	0	0	0
281.25	0	0	0	0	0	0	0
303.75	0	1	1	0	0	0	0
326.25	0	1	0	0	1	1	0

NRC CATEGORY C

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	0	0	0	1	0
11.25	1	1	0	0	1	0	0
33.75	0	1	0	0	1	0	0
56.25	0	0	1	0	1	0	0
78.75	0	1	0	0	0	1	2
101.25	5	1	1	0	3	0	0
123.75	0	0	0	1	0	0	0
146.25	0	0	0	0	0	0	0
168.75	0	0	3	5	2	0	0
191.25	0	0	0	3	3	0	0
213.75	0	0	0	0	0	3	0
236.25	0	0	0	1	0	2	0
258.75	0	0	0	0	0	0	0
281.25	0	0	0	0	1	0	0
303.75	0	0	4	2	0	0	0
326.25	0	0	3	0	0	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	4	7	8	1	1	0
11.25	0	2	4	4	1	6	2
33.75	0	1	3	5	1	8	4
56.25	0	1	3	0	1	1	4
78.75	0	0	0	1	1	1	0
101.25	52	1	0	0	0	0	4
123.75	0	1	2	3	0	0	0
146.25	0	2	8	4	1	0	0
168.75	0	2	6	15	7	1	2
191.25	0	6	4	3	17	6	4
213.75	0	4	3	4	13	1	3
236.25	3	7	2	1	6	3	2
258.75	0	5	4	3	2	1	0
281.25	0	4	5	5	5	0	0
303.75	2	11	22	17	2	0	0
326.25	0	9	10	12	2	1	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	6	12	6	13	3	0
11.25	0	2	12	3	8	3	1
33.75	1	2	9	7	7	5	6
56.25	0	2	0	5	6	1	2
78.75	0	2	1	2	3	0	0
101.25	86	2	1	3	1	1	1
123.75	0	2	5	7	7	0	0
146.25	0	3	11	24	9	1	0
168.75	1	0	18	33	21	1	0
191.25	0	4	8	16	27	11	3
213.75	1	3	5	8	8	2	1
236.25	2	9	9	6	9	0	1
258.75	1	11	6	5	2	0	0
281.25	0	8	14	8	4	2	0
303.75	0	7	24	17	4	3	1
326.25	1	4	17	5	8	0	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	9	11	10	1	0	0
11.25	0	3	10	9	2	0	0
33.75	0	3	1	4	0	1	0
56.25	0	1	1	3	0	0	0
78.75	0	0	1	2	1	0	0
101.25	48	0	1	0	0	0	0
123.75	1	0	2	0	0	0	0
146.25	1	2	12	19	0	0	0
168.75	0	2	25	24	1	0	0
191.25	0	2	14	7	7	0	0
213.75	1	5	10	6	2	0	1
236.25	1	9	5	3	0	0	0
258.75	2	10	9	5	1	0	0
281.25	0	7	5	4	1	0	0
303.75	1	14	22	4	1	0	0
326.25	0	8	16	2	1	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	4	3	1	0	0	0
11.25	0	3	2	2	0	0	0
33.75	0	1	3	1	0	0	0
56.25	0	2	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	18	0	0	0	0	0	0
123.75	1	0	0	0	0	0	0
146.25	7	2	3	5	0	0	0
168.75	1	2	15	8	0	1	0
191.25	0	3	2	3	2	0	0
213.75	0	3	3	1	0	0	0
236.25	0	5	2	0	0	0	0
258.75	0	5	2	0	0	0	0
281.25	1	2	2	1	0	0	0
303.75	0	10	18	3	0	0	0
326.25	0	9	12	0	0	0	0

Table 5-2 1st Quarter, 245 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 01/01/99 TO HOUR 23 ON 03/31/99

The total hours are 2160, 1793 hours read and 367 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	0	4	1	4	0	0
11.25	1	0	0	0	0	0	0
33.75	0	0	1	0	0	0	0
56.25	0	0	2	0	0	0	0
78.75	0	0	1	0	0	0	0
101.25	0	0	1	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	1	0	1	4	0	0	0
168.75	1	1	0	2	2	0	0
191.25	0	1	2	3	4	2	1
213.75	0	0	0	1	3	1	2
236.25	0	1	0	0	0	1	0
258.75	0	1	0	0	1	0	0
281.25	0	0	0	1	0	0	0
303.75	0	2	0	2	2	0	0
326.25	0	0	2	6	6	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	2	0	0	0	0	0
11.25	1	0	0	0	0	0	0
33.75	1	0	0	0	0	0	0
56.25	0	0	1	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	1	0	1	0	0	0
168.75	0	0	2	1	0	0	0
191.25	0	1	0	2	3	4	0
213.75	0	1	0	0	1	2	1
236.25	0	0	0	0	1	2	1
258.75	0	0	0	1	1	0	0
281.25	0	0	0	0	1	0	0
303.75	0	1	0	0	0	0	0
326.25	0	3	0	1	1	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	0	0	2	0	0
11.25	0	1	0	0	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	2	0	1	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	1	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	0	0	1	0	0	0
168.75	0	1	0	0	1	1	0
191.25	0	1	0	4	0	6	0
213.75	1	0	0	2	1	4	1
236.25	0	0	0	0	0	3	4
258.75	0	3	0	0	0	0	1
281.25	0	0	1	0	0	0	0
303.75	1	1	2	0	0	0	0
326.25	1	1	3	1	2	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	1	3	2	0	1	0
11.25	1	4	3	0	0	2	0
33.75	0	1	2	3	0	0	0
56.25	1	2	0	0	1	0	0
78.75	2	2	1	1	0	0	0
101.25	0	1	0	0	0	0	0
123.75	1	0	1	0	0	0	0
146.25	6	1	7	14	0	0	0
168.75	5	7	1	6	7	4	0
191.25	3	11	6	5	22	16	22
213.75	3	4	3	4	8	16	27
236.25	1	5	0	2	3	8	3
258.75	0	3	3	1	5	2	8
281.25	1	3	3	4	3	2	0
303.75	5	12	23	16	11	0	0
326.25	2	5	7	12	3	0	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	3	2	6	3	2	0	0
11.25	1	2	4	6	0	0	0
33.75	0	1	2	7	1	0	0
56.25	0	3	1	2	1	0	0
78.75	0	2	1	0	2	0	0
101.25	1	5	1	0	1	1	0
123.75	2	4	4	5	7	1	0
146.25	4	3	5	12	6	10	5
168.75	7	5	7	16	23	18	12
191.25	3	6	6	6	43	36	33
213.75	3	10	5	8	23	25	25
236.25	3	9	6	8	11	10	4
258.75	0	4	7	6	3	6	5
281.25	2	2	7	9	8	7	1
303.75	4	4	5	18	17	3	0
326.25	2	5	16	7	5	0	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	5	1	11	2	1	0	0
11.25	3	2	4	0	0	0	0
33.75	3	1	9	2	0	0	0
56.25	0	3	4	1	0	0	0
78.75	0	1	4	0	1	0	0
101.25	0	1	0	0	0	0	0
123.75	1	2	3	0	2	0	0
146.25	1	3	7	10	8	2	0
168.75	6	5	17	27	9	3	1
191.25	5	3	7	15	28	12	2
213.75	3	2	9	7	6	5	4
236.25	2	2	4	2	4	4	0
258.75	2	2	3	2	5	2	0
281.25	1	1	4	0	6	5	0
303.75	5	2	5	10	12	1	0
326.25	17	6	7	5	2	1	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	3	1	1	2	0	0
11.25	2	0	2	0	0	0	0
33.75	1	0	1	2	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	1	2	0	1	0	0
101.25	0	2	0	0	0	0	0
123.75	0	1	1	0	0	0	0
146.25	2	4	8	4	0	0	0
168.75	1	2	13	8	0	0	0
191.25	1	1	7	13	5	1	0
213.75	1	0	6	10	1	2	0
236.25	1	5	4	2	0	0	0
258.75	0	2	4	1	0	0	0
281.25	1	0	1	0	0	0	0
303.75	3	1	5	2	4	0	0
326.25	0	5	4	6	10	0	0

Table 5-3 2nd Quarter, 33 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON O4/01/99 TO HOUR 23 ON 06/30/99

The total hours are 2184, 2030 read and 154 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	4	11	16	13	0	0
11.25	0	3	8	7	1	0	0
33.75	0	3	2	4	2	0	0
56.25	0	0	3	0	0	0	0
78.75	0	3	2	2	0	0	0
101.25	0	6	9	0	0	0	0
123.75	0	4	7	3	0	0	0
146.25	0	3	11	9	2	0	0
168.75	1	4	13	10	15	0	0
191.25	0	2	1	5	6	0	0
213.75	0	6	7	4	1	1	1
236.25	0	2	5	2	8	4	0
258.75	0	3	4	5	2	0	0
281.25	1	0	6	7	1	2	0
303.75	0	3	6	2	3	0	0
326.25	1	4	10	5	4	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	5	7	3	0	0
11.25	0	2	1	2	0	0	0
33.75	0	0	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	1	1	0	0	0	0
101.25	0	1	2	1	0	0	0
123.75	0	3	5	2	0	0	0
146.25	0	1	4	7	2	0	0
168.75	0	0	8	2	4	0	0
191.25	0	0	2	5	5	0	0
213.75	0	0	5	3	3	1	3
236.25	0	2	0	1	1	0	0
258.75	0	0	1	2	3	0	0
281.25	0	0	1	3	1	2	1
303.75	0	1	4	1	0	0	0
326.25	0	2	6	7	0	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	1	4	4	0	0
11.25	0	0	0	3	0	0	0
33.75	0	0	1	0	0	0	0
56.25	0	1	0	0	0	0	0
78.75	0	1	0	0	0	0	0
101.25	0	1	0	1	0	0	0
123.75	0	1	3	0	0	0	0
146.25	0	0	4	3	0	0	0
168.75	1	1	2	3	6	1	0
191.25	0	2	5	1	6	2	0
213.75	0	1	3	6	1	2	1
236.25	0	1	1	5	1	2	0
258.75	0	1	2	3	1	0	0
281.25	0	1	2	3	2	2	2
303.75	0	1	4	2	0	0	0
326.25	0	0	5	2	0	0	0

NRC CATEGORY D

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	3	11	11	8	0	0
11.25	0	2	5	12	2	0	0
33.75	0	3	5	1	2	0	0
56.25	0	4	4	2	0	0	0
78.75	0	4	5	6	0	0	0
101.25	1	6	3	5	3	0	0
123.75	0	4	7	10	0	0	0
146.25	0	2	17	17	4	0	0
168.75	0	3	15	20	15	0	0
191.25	1	4	9	8	15	1	0
213.75	0	5	9	16	4	0	4
236.25	0	1	15	8	3	3	0
258.75	1	2	8	12	5	3	0
281.25	0	1	9	11	25	14	4
303.75	0	1	6	7	8	3	0
326.25	0	1	7	7	5	0	0

NRC CATEGORY E

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	5	7	0	0	0
11.25	0	2	5	0	0	0	0
33.75	0	4	2	0	0	0	0
56.25	0	5	1	0	0	0	0
78.75	0	1	1	0	0	0	0
101.25	1	3	5	2	0	0	0
123.75	0	7	11	5	1	0	0
146.25	0	6	17	10	3	0	0
168.75	1	5	11	15	11	0	0
191.25	0	7	8	6	11	1	0
213.75	0	4	9	4	5	0	2
236.25	1	2	14	8	4	0	0
258.75	0	4	13	20	6	1	0
281.25	1	5	11	44	35	13	2
303.75	0	5	9	18	12	1	0
326.25	1	4	6	8	0	1	0

NRC CATEGORY F

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	10	3	1	0	0	0
11.25	0	7	5	0	0	0	0
33.75	0	3	2	1	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	1	1	0	0	0	0
101.25	0	5	4	0	0	0	0
123.75	0	1	20	7	0	0	0
146.25	0	8	27	7	0	0	0
168.75	0	9	24	4	1	0	0
191.25	1	4	7	5	0	0	0
213.75	1	4	5	1	0	1	0
236.25	0	6	6	5	0	0	0
258.75	0	6	3	15	1	0	0
281.25	2	2	15	13	3	0	0
303.75	1	16	13	4	0	0	0
326.25	2	5	18	3	0	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	2	9	9	0	0	0	0
11.25	1	5	7	0	0	0	0
33.75	0	2	4	0	0	0	0
56.25	1	2	0	0	0	0	0
78.75	2	2	0	0	0	0	0
101.25	0	2	0	0	0	0	0
123.75	1	5	12	0	0	0	0
146.25	1	11	24	13	0	0	0
168.75	0	5	9	2	0	0	0
191.25	0	5	3	0	0	0	0
213.75	1	3	2	0	0	0	1
236.25	0	4	1	0	0	0	0
258.75	0	5	6	2	0	0	0
281.25	0	5	5	1	0	0	0
303.75	1	12	14	2	0	0	0
326.25	2	14	16	1	0	0	0

Table 5-4 2nd Quarter, 245 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 04/01/99 TO HOUR 23 ON 06/30/99

The total hours are 2184, 2030 read and 154 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	3	10	8	2	0
11.25	0	2	5	11	8	2	0
33.75	0	3	2	4	4	0	0
56.25	0	2	1	4	2	1	0
78.75	0	2	5	2	0	0	0
101.25	0	2	4	4	2	0	0
123.75	0	3	11	5	0	0	0
146.25	0	2	13	8	0	0	0
168.75	0	2	12	15	6	0	0
191.25	0	2	5	3	19	3	0
213.75	0	2	5	3	2	2	1
236.25	0	1	6	3	5	4	1
258.75	1	2	6	2	4	3	2
281.25	0	0	4	5	5	1	0
303.75	0	0	6	1	3	4	1
326.25	0	3	7	5	2	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	2	6	5	0	0
11.25	0	0	4	4	3	0	0
33.75	0	0	0	1	0	0	0
56.25	0	0	0	0	0	0	0
78.75	1	0	0	0	0	0	0
101.25	0	0	1	2	0	0	0
123.75	0	1	3	2	1	0	0
146.25	0	1	4	5	0	0	0
168.75	0	0	4	9	3	0	0
191.25	0	0	3	2	4	2	0
213.75	0	0	4	5	6	3	1
236.25	0	0	2	0	3	1	3
258.75	0	1	0	1	2	0	0
281.25	0	0	2	0	3	2	0
303.75	0	0	3	0	1	1	3
326.25	0	2	3	1	4	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	3	2	3	0	0
11.25	0	0	0	1	5	0	0
33.75	0	0	0	2	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	0	1	0	0	0	0
101.25	0	0	1	1	0	0	0
123.75	0	0	2	2	0	0	0
146.25	0	1	1	2	0	0	0
168.75	0	1	0	3	3	0	0
191.25	0	0	1	5	4	4	0
213.75	0	1	3	6	0	6	3
236.25	0	0	5	3	6	0	3
258.75	0	1	1	4	1	0	0
281.25	0	0	1	0	3	2	0
303.75	0	1	3	3	1	2	2
326.25	0	0	0	6	0	0	0

NRC CATEGORY D

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	3	8	5	0	0
11.25	0	1	6	10	14	0	0
33.75	0	0	5	7	3	0	0
56.25	0	1	3	6	0	1	0
78.75	0	2	1	6	0	0	0
101.25	0	2	4	3	5	0	0
123.75	0	6	7	4	6	1	0
146.25	0	2	8	8	5	0	0
168.75	0	0	11	17	7	0	0
191.25	0	3	10	20	17	7	0
213.75	1	0	10	13	14	10	4
236.25	0	1	8	13	10	1	2
258.75	0	1	8	8	7	4	4
281.25	0	0	6	12	12	5	9
303.75	0	2	3	5	11	15	15
326.25	0	0	6	4	7	1	1

NRC CATEGORY E

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	5	2	6	0	0
11.25	0	0	1	4	4	1	0
33.75	0	0	3	2	0	0	0
56.25	0	2	1	2	0	0	0
78.75	0	1	2	0	0	0	0
101.25	0	1	2	1	0	0	0
123.75	0	1	3	2	2	0	0
146.25	0	3	5	5	4	0	0
168.75	0	5	8	7	12	0	0
191.25	0	3	7	6	16	9	1
213.75	0	3	7	6	5	13	1
236.25	0	0	5	9	7	3	3
258.75	0	4	6	14	11	5	2
281.25	0	0	7	16	29	38	13
303.75	0	1	10	10	19	26	20
326.25	0	1	1	7	8	4	1

NRC CATEGORY F

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	2	12	3	7	0	0
11.25	0	1	4	4	2	0	0
33.75	0	2	7	1	1	1	0
56.25	0	1	4	4	1	0	0
78.75	0	1	2	0	0	0	0
101.25	0	1	1	1	0	0	0
123.75	0	1	4	1	1	0	0
146.25	0	2	3	7	4	2	0
168.75	0	3	13	11	8	0	0
191.25	0	3	9	14	2	1	0
213.75	0	2	7	5	2	2	0
236.25	0	3	15	4	0	0	0
258.75	0	2	9	9	2	4	0
281.25	0	3	0	12	26	22	4
303.75	0	1	3	1	7	3	2
326.25	0	0	8	6	4	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	16	11	1	0	0
11.25	0	1	6	5	0	0	0
33.75	0	0	6	1	4	1	0
56.25	0	1	0	3	2	0	0
78.75	0	0	2	0	0	0	0
101.25	0	2	3	0	0	0	0
123.75	0	1	3	0	1	0	0
146.25	0	3	14	7	4	0	0
168.75	0	2	12	10	2	0	0
191.25	0	2	8	13	6	0	0
213.75	0	4	6	6	0	0	1
236.25	0	0	4	1	0	0	0
258.75	0	0	0	2	2	0	0
281.25	0	0	2	6	0	4	0
303.75	0	0	4	11	1	1	0
326.25	0	1	9	11	7	0	0

Table 5-5 3rd Quarter, 33 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 07/01/99 TO HOUR 23 ON 09/30/99

The total hours are 2208, 1983 read and 225 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	11	25	35	1	0	0
11.25	0	9	17	9	0	0	0
33.75	0	5	6	2	0	0	0
56.25	0	5	2	0	0	0	0
78.75	0	8	2	0	0	0	0
101.25	0	9	3	1	0	0	0
123.75	1	4	17	8	1	0	0
146.25	0	3	14	15	0	0	0
168.75	0	3	9	11	4	0	0
191.25	0	1	5	3	3	0	0
213.75	0	4	0	2	2	0	0
236.25	0	6	0	3	2	3	0
258.75	0	4	0	5	0	1	0
281.25	0	4	2	3	1	7	0
303.75	0	10	8	4	1	0	0
326.25	0	13	24	15	2	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	3	2	0	0	0	0
11.25	0	1	0	1	0	0	0
33.75	0	0	4	1	0	0	0
56.25	0	1	0	0	0	0	0
78.75	0	2	0	1	0	0	0
101.25	0	0	0	2	0	0	0
123.75	0	0	4	2	0	0	0
146.25	0	3	3	5	3	0	0
168.75	0	3	2	4	1	1	0
191.25	0	1	0	0	2	0	0
213.75	0	1	1	0	0	0	1
236.25	0	0	0	3	0	0	0
258.75	0	1	0	1	1	1	0
281.25	0	0	1	1	2	0	0
303.75	0	2	1	0	0	1	0
326.25	0	1	0	1	0	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	4	1	0	0	0
11.25	0	2	3	1	0	0	0
33.75	0	2	3	0	0	0	0
56.25	0	2	0	0	0	0	0
78.75	0	0	1	0	0	0	0
101.25	0	2	0	1	0	0	0
123.75	0	1	3	4	1	0	0
146.25	0	0	5	3	1	0	0
168.75	0	2	4	2	2	0	0
191.25	0	1	1	1	2	0	0
213.75	0	0	0	2	0	0	0
236.25	1	1	1	1	0	0	0
258.75	0	1	4	0	0	1	0
281.25	0	2	2	0	2	2	0
303.75	0	2	1	1	0	2	0
326.25	0	1	4	2	0	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	4	18	6	3	0	0
11.25	0	5	10	6	0	0	0
33.75	0	2	8	1	0	0	0
56.25	0	6	5	0	0	0	0
78.75	0	3	5	1	0	0	0
101.25	0	2	3	5	0	0	0
123.75	0	0	6	5	1	0	0
146.25	0	4	11	13	6	1	0
168.75	0	5	7	5	9	5	0
191.25	0	2	3	3	4	0	0
213.75	0	2	4	2	2	0	1
236.25	0	3	3	4	2	0	0
258.75	0	4	3	4	2	0	0
281.25	0	4	4	6	4	7	3
303.75	0	4	7	4	2	2	0
326.25	0	3	7	3	0	0	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	7	14	8	0	0	0
11.25	0	1	14	9	1	0	0
33.75	0	0	12	8	1	0	0
56.25	1	3	7	4	0	0	0
78.75	0	4	0	1	0	0	0
101.25	0	2	3	15	0	0	0
123.75	0	4	15	20	0	0	0
146.25	0	7	11	18	6	0	0
168.75	0	2	4	9	3	0	0
191.25	0	1	8	5	1	0	0
213.75	0	9	7	3	1	0	0
236.25	0	1	8	6	1	0	0
258.75	0	1	7	12	9	0	0
281.25	1	7	15	31	30	7	1
303.75	1	5	12	23	6	3	0
326.25	2	4	20	7	1	0	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	18	13	1	2	0	0
11.25	0	8	19	2	0	0	0
33.75	2	7	1	0	0	0	0
56.25	1	2	0	0	0	0	0
78.75	0	2	1	0	0	0	0
101.25	0	1	2	3	0	0	0
123.75	0	4	17	16	0	0	0
146.25	1	8	30	17	0	0	0
168.75	0	11	17	6	0	0	0
191.25	1	7	12	6	1	0	0
213.75	0	5	6	5	0	0	0
236.25	0	2	1	1	0	0	0
258.75	0	6	7	3	0	0	0
281.25	0	5	12	9	1	0	0
303.75	0	4	18	8	1	0	0
326.25	0	7	15	3	0	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	30	31	1	0	0	0
11.25	0	27	32	0	0	0	0
33.75	2	10	5	1	0	0	0
56.25	2	4	0	0	0	0	0
78.75	0	2	0	0	0	0	0
101.25	0	2	0	0	0	0	0
123.75	1	6	9	0	0	0	0
146.25	0	8	19	4	0	0	0
168.75	1	4	7	2	0	0	0
191.25	1	8	4	0	0	0	0
213.75	1	2	4	0	0	0	0
236.25	0	1	1	0	0	0	0
258.75	0	5	1	1	0	0	0
281.25	1	4	4	1	0	0	0
303.75	0	15	20	4	0	0	0
326.25	2	18	26	1	0	0	0

Table 5-6 3rd Quarter, 245 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 07/01/99 TO HOUR 23 ON 09/30/99

The total hours are 2208, 1982 read and 226 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	25	7	19	8	4	0	0
11.25	13	4	13	19	0	0	0
33.75	2	4	6	3	0	0	0
56.25	1	5	4	2	0	0	0
78.75	0	2	5	1	0	0	0
101.25	0	6	1	2	0	0	0
123.75	6	3	5	4	0	0	0
146.25	5	5	10	10	5	0	0
168.75	5	5	9	12	5	0	0
191.25	1	0	5	9	7	2	0
213.75	4	0	2	3	0	1	0
236.25	0	7	1	4	0	3	0
258.75	4	1	1	4	3	1	1
281.25	2	1	1	2	1	2	1
303.75	3	7	4	1	1	0	5
326.25	1	7	18	9	2	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	0	0	0	0	0	0
11.25	0	1	1	1	0	0	0
33.75	0	0	2	1	0	0	0
56.25	0	0	2	2	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	2	0	0	0	0	0
123.75	2	3	1	2	0	0	0
146.25	0	0	2	6	0	0	0
168.75	0	1	4	4	3	1	0
191.25	0	0	0	2	4	1	0
213.75	0	1	2	0	0	2	1
236.25	0	0	0	1	0	0	0
258.75	0	1	1	1	1	2	0
281.25	0	0	0	1	0	2	0
303.75	0	2	1	0	1	1	0
326.25	0	2	0	0	0	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	3	0	1	3	0	0	0
11.25	0	0	2	1	0	0	0
33.75	0	1	2	1	0	0	0
56.25	0	0	2	1	0	0	0
78.75	1	2	1	0	0	0	0
101.25	0	0	0	1	0	0	0
123.75	0	1	3	2	0	0	0
146.25	0	1	2	4	1	0	0
168.75	2	2	5	5	1	0	0
191.25	0	0	2	2	1	2	0
213.75	0	0	1	2	1	0	0
236.25	0	1	1	1	0	0	0
258.75	0	2	0	2	1	0	0
281.25	0	1	4	1	0	2	1
303.75	1	0	1	1	0	1	2
326.25	1	0	1	2	0	0	0

NRC CATEGORY D

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	3	7	7	0	0	0
11.25	0	2	6	7	7	0	0
33.75	2	3	7	5	0	0	0
56.25	1	2	3	2	0	0	0
78.75	1	2	4	1	0	0	0
101.25	0	3	4	2	0	0	0
123.75	0	3	3	11	1	0	0
146.25	0	2	9	7	0	0	0
168.75	0	3	8	14	9	2	0
191.25	1	0	6	4	3	10	2
213.75	0	2	3	1	4	2	1
236.25	0	1	1	4	2	1	0
258.75	1	2	3	4	1	2	0
281.25	0	4	3	6	3	2	2
303.75	1	3	7	4	5	3	7
326.25	1	4	5	4	0	0	1

NRC CATEGORY E

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	5	0	7	13	2	0	0
11.25	0	2	8	8	0	0	0
33.75	0	0	4	7	4	5	0
56.25	0	0	5	5	3	0	0
78.75	0	1	5	7	1	0	0
101.25	1	4	3	3	2	0	0
123.75	1	3	3	17	2	0	0
146.25	1	3	8	12	2	0	0
168.75	1	4	4	10	13	5	0
191.25	0	2	4	8	13	3	0
213.75	0	2	6	2	6	2	0
236.25	0	3	2	1	3	0	0
258.75	3	1	7	12	12	1	0
281.25	6	2	3	12	22	25	9
303.75	2	3	2	19	12	24	14
326.25	5	1	4	10	7	1	0

NRC CATEGORY F

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	4	1	5	4	1	0	0
11.25	2	3	5	5	3	0	0
33.75	1	0	4	6	5	0	0
56.25	1	2	3	1	0	0	0
78.75	2	2	2	0	0	0	0
101.25	3	1	1	0	0	0	0
123.75	2	4	7	4	2	0	0
146.25	0	2	7	9	5	0	0
168.75	0	3	10	11	10	1	0
191.25	1	5	13	11	10	3	0
213.75	0	8	4	12	4	0	0
236.25	0	8	9	8	1	0	0
258.75	1	4	3	3	5	0	0
281.25	2	0	5	5	13	4	0
303.75	4	4	4	5	12	5	0
326.25	11	2	8	12	5	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	2	7	14	14	0	0	0
11.25	1	8	11	2	0	0	0
33.75	1	3	8	7	1	0	0
56.25	0	5	6	1	1	0	0
78.75	0	1	6	0	0	0	0
101.25	1	0	1	0	0	0	0
123.75	1	1	9	1	1	0	0
146.25	1	7	18	8	0	0	0
168.75	5	7	17	1	0	0	0
191.25	0	3	8	4	2	0	0
213.75	0	3	7	5	2	0	0
236.25	1	4	6	2	0	0	0
258.75	2	4	2	0	0	0	0
281.25	0	2	5	1	4	2	0
303.75	7	3	4	16	2	1	0
326.25	16	3	16	16	6	0	0

Table 5-7 4th Quarter, 33 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 10/1/99 TO HOUR 23 ON 12/31/99

The total hours are 2208, 2114 read and 94 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	8	9	9	0	0	0
11.25	0	12	3	0	0	0	0
33.75	0	3	4	0	0	0	0
56.25	0	3	3	0	0	0	0
78.75	0	5	3	0	0	0	0
101.25	1	2	3	1	0	0	0
123.75	0	3	6	6	1	0	0
146.25	1	1	4	9	2	0	0
168.75	0	3	3	8	14	5	3
191.25	0	1	1	2	4	0	0
213.75	0	0	2	4	2	1	0
236.25	0	1	1	1	3	1	0
258.75	0	2	3	0	4	1	0
281.25	0	2	4	1	5	4	0
303.75	0	4	6	4	4	0	0
326.25	0	3	13	15	1	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	1	0	0	0	0
11.25	0	0	1	0	0	0	0
33.75	0	0	2	0	0	0	0
56.25	0	1	1	0	0	0	0
78.75	0	1	0	0	0	0	0
101.25	0	0	1	1	0	0	0
123.75	0	0	2	0	4	0	0
146.25	0	0	0	3	2	1	0
168.75	0	0	0	3	5	0	0
191.25	0	0	0	3	0	4	0
213.75	0	0	0	1	0	2	0
236.25	0	0	0	1	0	0	0
258.75	1	1	0	2	2	0	0
281.25	0	0	1	0	4	0	0
303.75	0	2	0	4	0	0	0
326.25	0	0	2	0	0	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	1	1	1	0	0	0
11.25	1	0	2	0	0	0	0
33.75	0	1	1	0	0	0	0
56.25	0	1	0	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	2	0	1	3	0	0
146.25	0	0	1	3	4	0	0
168.75	0	0	0	6	1	6	0
191.25	0	0	0	0	2	5	0
213.75	0	0	0	1	0	0	0
236.25	0	0	0	0	1	0	0
258.75	0	0	0	0	1	0	0
281.25	0	2	3	2	2	0	0
303.75	0	1	4	3	0	0	0
326.25	0	0	0	2	0	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	4	8	1	0	0	0
11.25	0	1	5	0	0	0	0
33.75	0	2	0	0	0	0	0
56.25	0	0	0	0	0	0	0
78.75	0	1	1	0	0	0	0
101.25	0	0	1	1	1	0	0
123.75	0	4	8	10	6	1	0
146.25	3	3	7	12	24	2	0
168.75	1	2	6	7	30	29	4
191.25	0	3	5	7	12	9	4
213.75	0	7	5	9	1	1	0
236.25	0	2	2	4	2	2	0
258.75	1	8	6	10	3	0	0
281.25	0	4	18	8	6	1	0
303.75	0	9	18	5	0	0	0
326.25	0	4	8	0	0	0	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	7	7	0	0	0	0
11.25	0	8	8	0	0	0	0
33.75	5	4	3	0	0	0	0
56.25	1	4	1	0	0	0	0
78.75	1	4	2	0	0	0	0
101.25	1	4	2	2	1	0	0
123.75	1	10	17	34	13	1	0
146.25	1	13	39	41	10	0	0
168.75	1	13	22	24	30	5	4
191.25	4	14	15	11	14	7	7
213.75	3	15	11	8	2	2	4
236.25	2	12	14	6	2	1	1
258.75	2	10	19	17	4	0	0
281.25	4	22	36	23	6	0	0
303.75	5	17	34	6	0	0	0
326.25	0	17	27	1	0	0	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	11	16	0	0	0	0
11.25	1	10	5	1	0	0	0
33.75	0	8	2	0	0	0	0
56.25	1	5	0	0	0	0	0
78.75	0	4	0	0	0	0	0
101.25	1	1	4	0	0	0	0
123.75	1	8	14	26	0	0	0
146.25	0	4	34	24	4	0	0
168.75	3	10	13	9	4	0	1
191.25	1	0	7	3	2	0	0
213.75	1	5	3	4	0	0	0
236.25	0	9	3	7	1	0	0
258.75	4	10	8	11	2	0	0
281.25	1	13	23	11	0	0	0
303.75	2	11	17	0	0	0	0
326.25	0	8	20	1	0	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	2	5	4	0	0	0	0
11.25	0	9	9	0	0	0	0
33.75	0	2	2	0	0	0	0
56.25	1	1	0	0	0	0	0
78.75	0	5	0	0	0	0	0
101.25	2	2	2	0	0	0	0
123.75	1	5	7	3	0	0	0
146.25	1	4	7	11	1	0	0
168.75	0	4	7	3	0	0	0
191.25	0	1	2	0	0	0	0
213.75	0	5	3	2	0	0	0
236.25	1	3	2	1	0	0	0
258.75	0	1	3	0	0	0	0
281.25	3	7	13	3	0	0	0
303.75	4	10	19	2	0	0	0
326.25	2	7	23	1	0	0	0

Table 5-8 4th Quarter, 245 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 10/1/99 TO HOUR 23 ON 12/31/99

The total hours are 2208, 2114 read and 94 missing.

NRC CATEGORY A

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	2	13	14	2	0	0
11.25	0	10	3	0	0	0	0
33.75	0	2	4	0	0	0	0
56.25	0	2	5	0	0	0	0
78.75	0	2	5	0	0	0	0
101.25	0	4	2	0	0	0	0
123.75	0	2	8	1	0	0	0
146.25	0	3	8	7	2	0	0
168.75	0	0	2	6	8	0	0
191.25	0	2	3	3	8	7	8
213.75	1	0	3	0	5	2	0
236.25	1	2	1	1	4	0	2
258.75	0	1	2	1	4	2	1
281.25	0	1	4	0	0	5	0
303.75	0	3	3	2	1	3	1
326.25	0	4	10	15	5	0	0

NRC CATEGORY B

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	2	0	0	0	0
11.25	0	1	0	0	0	0	0
33.75	0	0	1	0	0	0	0
56.25	0	0	3	0	0	0	0
78.75	0	1	0	0	0	0	0
101.25	0	1	1	0	0	0	0
123.75	0	0	0	1	0	0	0
146.25	0	0	2	0	5	1	0
168.75	0	0	0	1	5	0	0
191.25	0	0	0	1	4	2	1
213.75	0	0	0	1	1	0	3
236.25	0	0	0	0	1	0	2
258.75	0	0	0	1	0	1	0
281.25	0	1	1	0	4	1	0
303.75	0	0	0	2	2	0	0
326.25	0	2	2	2	0	0	0

NRC CATEGORY C

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	0	2	3	0	0	0
11.25	0	0	0	0	0	0	0
33.75	0	1	1	1	0	0	0
56.25	0	1	0	0	0	0	0
78.75	0	0	1	0	0	0	0
101.25	0	0	0	0	0	0	0
123.75	0	0	0	0	0	0	0
146.25	0	1	1	1	3	0	0
168.75	0	0	1	0	5	2	0
191.25	0	0	0	4	2	1	7
213.75	0	0	0	0	2	0	4
236.25	0	0	0	0	1	0	0
258.75	0	0	0	0	1	1	0
281.25	0	2	0	1	0	1	0
303.75	0	0	2	3	1	1	0
326.25	0	2	4	1	0	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	2	6	1	0	0	0
11.25	0	2	8	2	0	0	0
33.75	0	0	3	1	0	0	0
56.25	0	0	2	0	0	0	0
78.75	0	0	0	0	0	0	0
101.25	0	1	0	1	0	0	0
123.75	1	0	0	2	0	1	0
146.25	1	1	3	7	6	1	0
168.75	4	1	2	12	13	17	2
191.25	1	1	4	3	13	24	44
213.75	0	1	2	5	3	10	13
236.25	0	5	3	6	9	0	3
258.75	0	5	2	3	1	2	3
281.25	0	4	8	3	12	6	2
303.75	0	3	16	16	6	1	0
326.25	0	4	13	6	0	0	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	8	13	3	0	0	0
11.25	0	4	8	3	0	0	0
33.75	1	6	1	2	0	0	0
56.25	1	2	6	0	0	0	0
78.75	1	4	1	0	0	0	0
101.25	1	3	2	1	1	0	0
123.75	2	1	6	2	2	0	0
146.25	0	2	15	22	14	8	3
168.75	1	6	21	20	25	14	2
191.25	2	14	24	16	25	31	20
213.75	0	15	7	5	9	14	19
236.25	0	9	5	4	3	1	6
258.75	1	7	17	5	8	3	3
281.25	1	13	23	21	17	14	4
303.75	1	10	27	33	13	0	0
326.25	0	10	25	24	2	0	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	3	11	4	00	0	0
11.25	1	5	5	4	0	0	0
33.75	0	4	8	3	0	0	0
56.25	0	4	5	1	0	0	0
78.75	1	1	1	0	0	0	0
101.25	0	2	2	0	0	0	0
123.75	0	6	8	3	2	0	0
146.25	2	7	13	21	21	0	0
168.75	2	4	6	11	14	4	1
191.25	0	5	9	11	9	3	2
213.75	0	2	8	8	5	3	1
236.25	0	2	6	2	2	0	0
258.75	0	0	1	1	7	7	0
281.25	0	4	7	7	9	7	1
303.75	0	3	6	31	19	0	0
326.25	0	5	10	18	2	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	2	10	4	0	0	0
11.25	4	1	8	3	0	0	0
33.75	0	2	5	1	0	0	0
56.25	0	1	4	1	0	0	0
78.75	1	2	3	1	0	0	0
101.25	1	1	3	0	0	0	0
123.75	0	2	3	1	2	0	0
146.25	1	1	5	11	2	0	0
168.75	4	2	9	5	4	1	0
191.25	1	2	5	4	4	0	0
213.75	1	2	4	2	1	0	0
236.25	0	3	3	1	0	0	0
258.75	0	4	2	1	2	0	0
281.25	0	1	0	4	9	2	0
303.75	0	0	4	16	8	0	0
326.25	0	2	6	8	4	0	0

Table 5-9 Year 1999, 33 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 01/01/99 TO HOUR 23 ON 12/31/99

The total hours are 8760, 7919 read and 841 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	24	45	62	15	0	0
11.25	0	26	28	16	1	0	0
33.75	0	11	14	6	2	0	0
56.25	0	9	8	0	0	0	0
78.75	1	16	7	3	0	1	0
101.25	9	17	16	2	1	0	0
123.75	1	11	31	19	2	0	0
146.25	1	7	29	37	4	0	0
168.75	2	10	27	34	34	7	3
191.25	2	4	8	11	13	1	1
213.75	0	10	9	10	5	2	1
236.25	0	10	6	6	13	8	0
258.75	0	9	7	10	6	2	0
281.25	1	6	12	13	7	13	0
303.75	0	17	22	18	10	0	0
326.25	1	21	51	42	7	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	5	8	7	3	0	0
11.25	0	3	2	3	0	0	0
33.75	0	0	6	1	1	0	0
56.25	0	2	2	0	0	0	2
78.75	0	4	1	1	0	0	0
101.25	5	1	3	4	0	0	0
123.75	0	3	12	5	4	0	0
146.25	0	4	7	16	7	1	0
168.75	0	3	12	15	12	1	0
191.25	0	1	2	9	10	4	0
213.75	0	1	6	4	4	5	4
236.25	2	2	0	5	1	0	0
258.75	2	2	1	5	6	1	0
281.25	0	0	3	4	7	2	1
303.75	0	6	6	5	0	1	0
326.25	0	4	8	8	1	1	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	0	3	6	6	4	1	0
11.25	2	3	5	4	1	0	0
33.75	0	4	5	0	1	0	0
56.25	0	4	1	0	1	0	0
78.75	0	2	1	0	0	1	2
101.25	5	4	1	2	3	0	0
123.75	0	4	6	6	4	0	0
146.25	0	0	10	9	5	0	0
168.75	1	3	9	16	11	7	0
191.25	0	3	6	5	13	7	0
213.75	0	1	3	9	1	5	1
236.25	1	2	2	7	2	4	0
258.75	0	2	6	3	2	1	0
281.25	0	5	7	5	7	4	2
303.75	0	4	13	8	0	2	0
326.25	0	1	12	6	0	0	0

NRC CATEGORY D

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	15	44	26	12	1	0
11.25	0	10	24	22	3	6	2
33.75	0	8	16	7	3	8	4
56.25	0	11	12	2	1	1	4
78.75	0	8	11	8	1	1	0
101.25	53	9	7	11	4	0	4
123.75	0	9	23	28	7	1	0
146.25	3	11	43	46	35	3	0
168.75	1	12	34	47	61	35	6
191.25	1	15	21	21	48	16	8
213.75	0	18	21	31	20	2	8
236.25	3	13	22	17	13	8	2
258.75	2	19	21	29	12	4	0
281.25	0	13	36	30	40	22	7
303.75	2	25	53	33	12	5	0
326.25	0	17	32	22	7	1	0

NRC CATEGORY E

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	21	38	21	13	3	0
11.25	0	13	39	12	9	3	1
33.75	6	10	26	15	8	5	6
56.25	2	14	9	9	6	1	2
78.75	1	11	4	3	3	0	0
101.25	88	11	11	22	2	1	1
123.75	1	23	48	66	21	1	0
146.25	1	29	78	93	28	1	0
168.75	3	20	55	81	65	6	4
191.25	4	26	39	38	53	19	10
213.75	4	31	32	23	16	4	7
236.25	5	24	45	26	16	1	2
258.75	3	26	45	54	21	1	0
281.25	6	42	76	106	75	22	3
303.75	6	34	79	64	22	7	1
326.25	4	29	70	21	9	1	0

NRC CATEGORY F

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	3	48	43	12	3	0	0
11.25	1	28	39	12	2	0	0
33.75	2	21	6	5	0	1	0
56.25	2	8	1	3	0	0	0
78.75	0	7	3	2	1	0	0
101.25	49	7	11	3	0	0	0
123.75	2	13	53	49	0	0	0
146.25	2	22	103	67	4	0	0
168.75	3	32	79	43	6	0	1
191.25	3	13	40	21	10	0	0
213.75	3	19	24	16	2	1	1
236.25	1	26	15	16	1	0	0
258.75	6	32	27	34	4	0	0
281.25	3	27	55	37	5	0	0
303.75	4	45	70	16	2	0	0
326.25	2	28	69	9	1	0	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	5	48	47	2	0	0	0
11.25	1	44	50	2	0	0	0
33.75	2	15	14	2	0	0	0
56.25	4	9	0	0	0	0	0
78.75	2	9	0	0	0	0	0
101.25	20	6	2	0	0	0	0
123.75	4	16	28	3	0	0	0
146.25	9	25	53	33	1	0	0
168.75	2	15	38	15	0	1	0
191.25	1	17	11	3	2	0	0
213.75	2	13	12	3	0	0	1
236.25	1	13	6	1	0	0	0
258.75	0	16	12	3	0	0	0
281.25	5	18	24	6	0	0	0
303.75	5	47	71	11	0	0	0
326.25	6	48	77	3	0	0	0

Table 5-10 Year 1999, 245 FT AGL.

JOINT FREQUENCY DISTRIBUTION
FOR THE TIME PERIOD

FROM HOUR 00 ON 01/01/99 TO HOUR 23 ON 12/31/99

The total hours are 8760, 7919 read and 841 missing.

NRC CATEGORY A

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	26	9	39	33	18	2	0
11.25	14	16	21	30	8	2	0
33.75	2	9	13	7	4	0	0
56.25	1	9	12	6	2	1	0
78.75	0	6	16	3	0	0	0
101.25	0	12	8	6	2	0	0
123.75	6	8	24	10	0	0	0
146.25	6	10	32	29	7	0	0
168.75	6	8	23	35	21	0	0
191.25	1	5	15	18	38	14	9
213.75	5	2	10	7	10	6	3
236.25	1	11	8	8	9	8	3
258.75	5	5	9	7	12	6	4
281.25	2	2	9	8	6	8	1
303.75	3	12	13	6	7	7	7
326.25	1	14	37	35	15	0	0

NRC CATEGORY B

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	2	4	6	5	0	0
11.25	1	2	5	5	3	0	0
33.75	1	0	3	2	0	0	0
56.25	0	0	6	2	0	0	0
78.75	1	1	0	0	0	0	0
101.25	0	3	2	2	0	0	0
123.75	2	4	4	5	1	0	0
146.25	0	2	8	12	5	1	0
168.75	0	1	10	15	11	1	0
191.25	0	1	3	7	15	9	1
213.75	0	2	6	6	8	7	6
236.25	0	0	2	1	5	3	6
258.75	0	2	1	4	4	3	0
281.25	0	1	3	1	8	5	0
303.75	0	3	4	2	4	2	3
326.25	0	9	5	4	5	0	0

NRC CATEGORY C

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	3	1	6	8	5	0	0
11.25	0	1	2	2	5	0	0
33.75	0	2	3	4	0	0	0
56.25	0	3	2	2	0	0	0
78.75	1	2	3	0	0	0	0
101.25	0	0	1	3	0	0	0
123.75	0	1	5	4	0	0	0
146.25	0	3	4	8	4	0	0
168.75	2	4	6	8	10	3	0
191.25	0	1	3	15	7	13	7
213.75	1	1	4	10	4	10	8
236.25	0	1	6	4	7	3	7
258.75	0	6	1	6	3	1	1
281.25	0	3	6	2	3	5	1
303.75	2	2	8	7	2	4	4
326.25	2	3	8	10	2	0	0

NRC CATEGORY D

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	1	6	19	18	5	1	0
11.25	1	9	23	19	21	2	0
33.75	2	4	17	16	3	0	0
56.25	2	5	8	8	1	1	0
78.75	3	6	6	8	0	0	0
101.25	0	7	8	6	5	0	0
123.75	2	9	11	17	7	2	0
146.25	7	6	27	36	11	1	0
168.75	9	11	22	49	36	23	2
191.25	5	15	26	32	55	57	68
213.75	4	7	18	23	29	38	45
236.25	1	12	12	25	24	10	8
258.75	1	11	16	16	14	10	15
281.25	1	11	20	25	30	15	13
303.75	6	20	49	41	33	19	22
326.25	3	13	31	26	10	1	2

NRC CATEGORY E

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	9	10	31	21	10	0	0
11.25	1	8	21	21	4	1	0
33.75	1	7	10	18	5	5	0
56.25	1	7	13	9	4	0	0
78.75	1	8	9	7	3	0	0
101.25	3	13	8	5	4	1	0
123.75	5	9	16	26	13	1	0
146.25	5	11	33	51	26	18	8
168.75	9	20	40	53	73	37	14
191.25	5	25	41	36	97	79	54
213.75	3	30	25	21	43	54	45
236.25	3	21	18	22	24	14	13
258.75	4	16	37	37	34	15	10
281.25	9	17	40	58	76	84	27
303.75	7	18	44	80	61	53	34
326.25	7	17	46	48	22	5	1

NRC CATEGORY F

	MPH						
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	10	7	39	13	9	0	0
11.25	6	11	18	13	5	0	0
33.75	4	7	28	12	6	1	0
56.25	1	10	16	7	1	0	0
78.75	3	5	9	0	1	0	0
101.25	3	5	4	1	0	0	0
123.75	3	13	22	8	7	0	0
146.25	3	14	30	47	38	4	0
168.75	8	15	46	60	41	8	2
191.25	6	16	38	51	49	19	4
213.75	3	14	28	32	17	10	5
236.25	2	15	34	16	7	4	0
258.75	3	8	16	15	19	13	0
281.25	3	8	16	24	54	38	5
303.75	9	10	18	47	50	9	2
326.25	28	13	33	41	13	1	0

NRC CATEGORY G

			MPH				
deg	0.07	0.60	3.00	7.00	12.00	18.00	24.00
0.00	3	13	41	30	3	0	0
11.25	7	10	27	10	0	0	0
33.75	2	5	20	11	5	1	0
56.25	0	7	10	5	3	0	0
78.75	1	4	13	1	1	0	0
101.25	2	5	7	0	0	0	0
123.75	1	5	16	2	4	0	0
146.25	4	15	45	30	6	0	0
168.75	10	13	51	24	6	1	0
191.25	2	8	28	34	17	1	0
213.75	2	9	23	23	4	2	1
236.25	2	12	17	6	0	0	0
258.75	2	10	8	4	4	0	0
281.25	1	3	8	11	13	8	0
303.75	10	4	17	45	15	2	0
326.25	16	11	35	41	27	0	0

6.0 DOSE ASSESSMENT -- IMPACT ON MAN

Liquid Effluents - There were no radioactive liquid discharges from WNP-2 in 1999.

Table 6-1 lists the doses to the maximum individual by calendar quarter, along with the cumulative total body and maximum organ values. Doses by calendar quarters to the average exposed individual are listed in Table 6-2. The 50-mile population doses by calendar quarter are listed in Table 6-3. Table 6-4 provides annual doses to the average individual and 50-mile population doses from liquid effluents. All doses would have been calculated using the NRC LADTAP II computer code if there were any releases.

Gaseous Effluents - The NRC GASPAR II computer code was used to calculate doses at and beyond the site boundary. Table 6-5 lists the annual 50-mile dose using values obtained from the ALARA annual integrated population dose summary (person-rem). Table 6-5 also provides the annual individual doses associated with each pathway. These values were obtained by dividing the ALARA integrated dose (person-rem) by the 50-mile population (252,356 for year 1987) and converting to mrem. The GASPAR II runs use quarterly and annual meteorological data and site specific input parameters.

Exposure to "A Member of the Public"

The WNP-2 Visitor Center was evaluated for assessment of radiation doses to "Members of the Public" due to their activities within the site boundary. The ODCM assumes an eight (8) hour per year occupancy by "A Member of the Public" at the Visitor Center. The dose assessment resulted in an annual calculated total body dose of 2.07E-05 mrem. The annual thyroid dose was 2.09E-05 mrem and the maximum dose to any other organ was 2.21E-05 mrem. The air dose contribution was as follows: Beta air dose was 4.04E-07 mrad and the Gamma air dose was 1.14E-06 mrad. The direct radiation contribution from TLD results calculated to an average of 8.26E-02 mrem per eight-hour period.

The 1999 TLD summary showed no significant change from pre-operational values. Based on one sigma error, the maximum direct radiation exposure to the public for calendar year 1999 was less than 10 mrem.

Dose Tables

Table 6-1A Maximum Individual Doses From Liquid Effluents:

First and Second Quarters -- 1999

1st Quarter				
Pathway	Total Body (mrem/qtr)	1999 Cumulative Total Body (mrem/yr)	Max. Organ (mrem/qtr)	1999 Cumulative Max. Organ (mrem/yr)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2nd Quarter				
Pathway	Total Body (mrem/qtr)	1999 Cumulative Total Body (mrem/yr)	Max. Organ (mrem/qtr)	1999 Cumulative Max. Organ (mrem/yr)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 6-1B Maximum Individual Doses From Liquid Effluents:

Third and Fourth Quarters -- 1999

3rd Quarter				
Pathway	Total Body (mrem/qtr)	1999 Cumulative Total Body (mrem/yr)	Max. Organ (mrem/qtr)	1999 Cumulative Max. Organ (mrem/yr)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

4th Quarter				
Pathway	Total Body (mrem/qtr)	1999 Cumulative Total Body (mrem/yr)	Max. Organ (mrem/qtr)	1999 Cumulative Max. Organ (mrem/yr)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

* Age Group - Adult: Maximum individual resides at Richland and fishes near the WNP-2 outfall area

Table 6-2 Average Individual Doses From Liquid Effluents -- 1999

Pathway	1st Quarter		2nd Quarter	
	Total Body (mrem)	Max. Organ (mrem)	Total Body (mrem)	Max. Organ (mrem)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Pathway	3rd Quarter		4th Quarter	
	Total Body (mrem)	Max. Organ (mrem)	Total Body (mrem)	Max. Organ (mrem)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat*	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

* Total population ALARA doses divided by the total population served from irrigated production; converted to mrem

Table 6-3 50-Mile Population Doses From Liquid Effluents -- 1999

Pathway	1st Quarter		2nd Quarter	
	Total Body (person-rem)	Max. Organ (person-rem)	Total Body (person-rem)	Max. Organ (person-rem)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Pathway	3rd Quarter		4th Quarter	
	Total Body (person-rem)	Max. Organ (person-rem)	Total Body (person-rem)	Max. Organ (person-rem)
Fishing	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 6-4 Annual Ladtap II Results for 1999

A. 50-mile population doses from WNP-2 liquid effluents

Pathway	Total Body (person-rem)	Max. Organ (person-rem)
Fishing	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00
Vegetables	0.00E+00	0.00E+00
Leafy Veg.	0.00E+00	0.00E+00
Milk	0.00E+00	0.00E+00
Meat	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

B. Average individual doses from WNP-2 liquid effluents

Pathway	Total Body (mrem)	Max. Organ (mrem)
Fishing	0.00E+00	0.00E+00
Drinking	0.00E+00	0.00E+00
Shoreline	0.00E+00	0.00E+00
Swimming	0.00E+00	0.00E+00
Boating	0.00E+00	0.00E+00
Vegetables*	0.00E+00	0.00E+00
Leafy Veg.*	0.00E+00	0.00E+00
Milk*	0.00E+00	0.00E+00
Meat*	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00

* Total population ALARA doses divided by the total population served from irrigated production; converted to mrem.

Table 6-5A Summary of Doses from WNP-2 Gaseous Effluents, 1999

1 Location: Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative
Beta air dose (mrad)	1.30E-04	0.00E+00	0.00E+00	0.00E+00	1.30E-04
Gamma air dose	3.96E-04	0.00E+00	0.00E+00	0.00E+00	3.96E-04

2 Location: Beyond Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative
Beta air dose (mrad)	6.89E-05	0.00E+00	0.00E+00	0.00E+00	6.89E-05
Gamma air dose	1.95E-04	0.00E+00	0.00E+00	0.00E+00	1.95E-04

3 Location: Site Boundary

	Annual Dose
Annual Total Body Dose (mrem)	4.25E-03
Annual Skin Dose (mrem)	4.40E-03

4 Location: Beyond Site Boundary

	Annual Dose
Annual total Body Dose (mrem)	1.23E-03
Annual Skin Dose (mrem)	1.22E-03

No measurable noble gas released in second, third, or fourth quarters

Table 6-5B Summary of Doses from WNP-2 Gaseous Effluents, 1999

5 Location: Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative
Maximum Organ dose (mrem)	2.12E-03	5.52E-03	1.88E-03	1.21E-03	1.07E-02

6 Location: Beyond Site Boundary

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative
Maximum Organ dose (mrem)	1.47E-03	7.19E-04	7.02E-04	4.03E-04	3.29E-03

7 Location: Land Use Census; 4.10E+00 Miles ESE

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Cumulative
Maximum Organ dose (mrem)	9.72E-04	7.19E-04	5.15E-04	4.03E-04	2.61E-03

Table 6-6 50-Mile Population Doses From 1999 Gaseous Effluents

A. 50-mile population

Exposure Pathway	Total Body (person-rem)	Max. Organ (person-rem)
Plume	4.85E-06	4.85E-06
Ground	5.87E-04	6.91E-04
Inhalation	8.56E-03	8.55E-03
Vegetables	6.19E-03	6.18E-03
Milk	2.17E-03	2.16E-03
Meat	1.36E-03	1.36E-03
Total	1.89E-02	2.03E-02

Population = > 2.50E+05

B. Average individual*

Exposure Pathway	Total Body (mrem)	Max. Organ (mrem)
Plume	1.94E-08	1.94E-08
Ground	2.35E-06	2.76E-06
Inhalation	3.42E-05	3.42E-05
Vegetables	2.48E-05	2.47E-05
Milk	8.68E-06	8.64E-06
Meat	5.44E-06	5.44E-06
Total	7.55E-05	7.58E-05

* The 50-mile population doses are divided by the population within 50 miles of the Plant by direction and radii interval, and converted to mrem.

7.0 REVISIONS TO THE ODCM

This section completes the requirement of Technical Specification 5.5.1. As specified, a complete, legible copy of the entire ODCM is included as an enclosure to the letter transmitting this Radioactive Effluent Release Report to the Nuclear Regulatory Commission (NRC).

8.0 REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

No changes were made to the Process Control Program (SWP-RMP-02) during the reporting period.

9.0 NEW OR DELETED LOCATIONS FOR DOSE ASSESSMENTS AND/OR ENVIRONMENTAL MONITORING LOCATIONS

There were no new or deleted locations for dose assessments or environmental monitoring.

10.0 MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE TREATMENT SYSTEMS

No major changes were made to the radioactive waste systems (liquid, gaseous, or solid) during this reporting period.

ENERGY NORTHWEST

P.O. Box 968 ■ Richland, Washington 99352-0968

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Gentlemen:

Subject: **WNP-2 OPERATING LICENSE NPF-21**
RADIOACTIVE EFFLUENT RELEASE REPORT
FOR JANUARY THROUGH DECEMBER 1999

In accordance with 10 CFR 50.36a(a)(2) and WNP-2 Technical Specification 5.6.3, the annual Radioactive Effluent Release Report is hereby submitted as an enclosure to this letter. As required by the Technical Specification, the report includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from WNP-2 during the reporting period.

A complete copy of the WNP-2 Offsite Dose Calculation Manual (ODCM) is also enclosed with this submittal as required by Technical Specification 5.5.1. This copy of the ODCM includes revisions made to the document since the last submittal.

Respectfully,

GO Smith
Vice President, Generation
Mail Drop 927M

Enclosures

cc: EW Merschoff - NRC RIV
JS Cushing – NRC NRR
NRC Sr. Resident Inspector – 927N
DL Williams – BPA/1399
AW Conklin - Dept. of Health
K Rhoads – PNNL (w/o ODCM)
DJ Ross - EFSEC (w/o ODCM)
D McBaugh - Dept. of Health
T Wolff - ANI (w/o ODCM)
RL Dirkes - PNNL (w/o ODCM)
TC Poindexter - Winston & Strawn (w/o ODCM)