INTRODUCTION AND SUMMARY

This report has been prepared for submittal to the United States Nuclear Regulatory Commission in meeting reporting requirements under the Operating License (DPR-54) for Rancho Seco Unit 1. This report contains information for the year 1980 in the following areas:

1) Tabulation of personnel receiving exposures greater than 100 mrem during 1980, according to work and job functions. This requirement is based on Technical Specification 6.9.2 (Appendix A), and follows the format of Regulatory Guide 1.16.

2) Tabulation of numbers of personnel for whom exposure monitoring was provided, according to classifications given in 10 CFR 20.407 and required as indicated in Technical Specification 6.9.2 (Appendix A).

3) Environmental protection programs for waste water control (as established by the California Regional Water Quality Control Board), and nonradiological and radiological effects upon the environment. All requirements in these areas are provided in Part 5.6.1 of Appendix B of the Technical Specifications.

4) Radioactive effluent and waste disposal information showing conformance to Appendix B Technical Specifications related to discharge limits.

Items 1, 2 and 3 above are required on an annual basis. Item 4 is required on a semiannual basis. Annually reported information is due within 90 days of the end of the report period; semiannual reporting has a 60-day due period.

The effluent and waste disposal information (Item 4) is committed by Technical Specification 5.6.1B (Appendix B) to be in the format provided in Regulatory Guide 1.21, which has been followed to the best of our ability.

Operating experience in 1980 included relatively few reductions of power and few shutdowns for equipment maintenance. A refueling outage started in mid-January and was completed in mid-April after also making significant plant modifications to fire control systems and piping supports. Plant availability for the year was 60.4%. The net total MWHr electrical output was 4,415,000.

Environmental levels of radioactivity reflected a continued long term reduction of nuclear weapons fallout until an atmospheric test by China on October 16 resulted in slight elevations of environmental air samples.

Samples of air, water, mud, vegetation, milk and animal life were taken in continuation of an environmental sampling program initiated prio to

plant operation. A significant additional monitoring of direct radiation in the environment was undertaken in June by instituting 43 new locations for TLD monitors. Other relatively minor changes were made to the environmental program such as placing Iodine carrier in the milk and reporting natural isotopes.

No evidence of thermal pollution or undesirable impact of chemicals in the waste water discharges was observed in 1980.

Calculated estimates of the radiation exposure to the public indicate that very small levels are continuing to be experienced as a result of excellent integrity of fuel, high integrity of steam generators, and continued efforts to control radioactivity by confinement.

The level of exposure for plant personnel increased from that experienced in 1979. This reflects the fact that refueling was performed during 1980. Exposure experience was near that expected from normal operation, in spite of significant construction work under TMI corrective actions.

A research program was initiated in September, 1977, to establish protective practices to prevent the formation of radioactive corrosion products, since that source of activity contributes significantly to personnel exposure. Modifications to chemical controls have effected well-defined differences in the solubility of crud during 1978, 1979, and 1980 operations; a program for crud reduction is being formulated under a consultant.

No discharges of radioactive material resulted in exceeding any of the Technical Specifications related to waste releases.

Accumulated radioactive water was disposed of by solidification in urea-formaldehyde under a program using vendor supplied portable mixing equipment. Between July 14 and September 10, 1980 a total 40,800 gallons of waste was solidified in 51 containers, each of 195 ft^3 volume. The dewatered containers were transported to the Richland, Washington burial site; approximately 53 Ci of activity was removed in this program.

I. NUMBER OF PERSONNEL AND MAN-REM EXPOSURE BY WORK AND JOB FUNCTION

A. PERSONNEL WHOLE BODY EXPOSURES

Table 1 gives a summary of the number of individuals for whom monitoring devices were provided, categorized into groups receiving whole body exposures within a specific dose range. Dosimetry consisted of film badge vendor-supplied services. Backup dosimetry utilized pocket ionization chambers, a Panasonic TLD system, and other integrating devices.

There were no instances of overexposure during 1980. Continued work to make use of a computerized dose recordkeeping system was not successful; the system was found deficient in reliability; all records were therefore manually updated during the year.

B. MAN-REM BY WORK AND JOB DESCRIPTION

Table 2 gives a summary of the number of individuals and the associated total man-rem exposure for five different job categories, with five categories of personnel work groups in each job category. The total man-rem for the year 1980 by this accounting is 292.5. It should be noted that the employee totals indicated in Table 2 represent the number of employees in each personnel category that were signed in on work of the various types.

TABLE 1

PERSONNEL WHOLE BODY EXPOSURES FOR CALEN YEAR 1980

Licensee Reporting (Name & Address) License No. DPR-54

Rancho Seco, Unit 1
Clay Station, California

Annual Dose Ranges (rem)	Number of Individuals in Each Range
No Measurable Exposure	243
Measurable Exposure less than 0.10	368
0.10 -- 0.25	136
0.25 -- 0.50	99
0.50 -- 0.75	78
0.75 -- 1	75
1 -- 2	117
2 -- 3	17
3 -- 4	0
4 -- 5	0
5 -- 6	0
6 -- 7	0
7 -- 8	0
8 -- 9	0
9 -- 10	0
10 -- 11	0
11 -- 12	0
12 +	0

Total Number of Individuals Reported 1133

The above information is submitted for the total number of individuals for whom personnel monitoring was: (check one)

[ ] required under 10CFR20.202(a) or 10CFR34.33(a) during the calendar year.

[X] provided during the calendar year.

TABLE 2

FILM BADGE - 1980

STANDARD FORMAT FOR REPORTING NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

Work & Job Function	Number of Personnel			Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance						
Maintenance Personnel	54	5	150	3.99	0.08	22.86
Operating Personnel	58	1	60	18.94	0.02	1.52
Health Physics Personnel	23	1	64	4.91	0.01	18.51
Supervisory Personnel	20	0	3	2.93	0.00	0.86
Engineering Personnel	30	10	99	1.67	0.16	1.75
Routine Maintenance/Inservice Insp.						
Maintenance Personnel	69	6	163	18.31	1.35	25.30
Operating Personnel	34	0	13	3.22	0.00	1.40
Health Physics Personnel	23	1	48	4.35	0.02	5.77
Supervisory Personnel	6	1	0	2.37	0.00	0.00
Engineering Personnel	21	2	70	2.47	0.02	1.53
Special Maintenance						
Maintenance Personnel	55	7	229	1.01	0.31	49.11
Operating Personnel	17	1	14	1.55	0.01	0.80
Health Physics Personnel	20	0	43	2.38	0.00	4.12
Supervisory Personnel	9	0	5	0.57	0.00	0.05
Engineering Personnel	18	2	175	0.81	0.03	10.03
Waste Processing						
Maintenance Personnel	39	1	129	3.20	0.02	27.15
Operating Personnel	34	0	2	2.79	0.00	0.62
Health Physics Personnel	21	0	35	2.37	0.00	2.02
Supervisory Personnel	9	0	1	7.02	0.00	8.43
Engineering Personnel	3	1	21	0.04	0.01	0.62
Refueling						
Maintenance Personnel	35	4	65	1.98	0.50	8.67
Operating Personnel	15	0	3	1.90	0.00	0.08
Health Physics Personnel	6	0	22	0.07	0.00	1.02
Supervisory Personnel	8	0	1	0.73	0.00	0.00
Engineering Personnel	12	1	38	0.91	0.03	7.25
TOTAL						
Maintenance Personnel	252	23	736	28.49	2.26	133.09
Operating Personnel	158	2	92	28.40	0.03	4.42
Health Physics Personnel	93	2	212	14.08	0.03	31.44
Supervisory Personnel	52	1	13	13.63	0.00	9.34
Engineering Personnel	84	16	403	5.89	0.25	21.18
GRAND TOTAL	639	44	1453	90.49	2.57	199.47

II. ENVIRONMENTAL PROTECTION

A. WASTE WATER - NONRADIOLOGICAL

.1 Waste Water Discharge - Temperature

The Technical Specifications Appendix B limit is 90°F (32°C) except for operational adjustments of flow or for certain emergency load requirements. Temperature recorded at the outfall ranged from 48°F to 106°F (9°C to 42°C). Temperature was below the specification of 90°F (32°C) except for one ten-minute period when auxiliary boilers were being blown down without sufficient dilution water.

.2 Waste Water Discharge - Chlorine

The Technical Specification Appendix B limit is 0.2mg/l, interpreted as an instantaneous limit for water leaving SMUD property. There was one (1) Unusual Event report submitted to NRC on this item during 1980. At the end of July chlorine exceeded the release limit at the plant discharge point. Under the NPDES permit, samples can be taken at the property line within one hour to assure compliance. Although one sample was taken showing compliance a later required sample was not taken.

.3 Waste Water Discharge - TDS

The Technical Specification Appendix B limits are 850 mg/l or 34,000 pounds per day; or 800 mg/l or 32,000 pounds per day as a 30-day average. Under the interpretation that the daily limits pertain to averages over a 24-hour period, there was one exceeding of the specifications. The maximum quantity of dissolved solids discharged in any day was 35,125 pounds on July 28; the cause was related to either an operational problem where an excessive overflow of circulating water was maintained, or possibly downstream restrictions resulted in erroneous flow measurements.

Additional requirements of Appendix B Technical Specifications in this area concern visual observations of the waste water course for any oil, grease, scum, foam, fungus, slime or undesirable biological growths. Weekly walkdowns and observations indicated no evidence of these undesirable materials during 1980. Normal vigorous plant growth along the water course occurred during most of the year.

.4 Waste Water Discharge - pH

The Technical Specification Appendix B limits are 6.5 to 8.5 except as specified by the California Regional Water Quality Control Board. Five Unusual Event reports were submitted to NRC which described problems with the automatic functions designed to prevent exceeding a pH limit in the waste water system.

One occurrence in March was attributed to placing in service a section of underground pipe that contained water which had been static for several months. The other instances occurred in May, June and July when the pH of the raw water supply exceeded 8.5 and various problems occurred in not having diversion controls set low enough, or monitoring of non-representatative effluent. Generally the pH limits were exceeded for brief periods and at levels of 8.6 to 8.7.

B. NON RADIOLOGICAL ENVIRONMENTAL MONITORING

.1 Erosion

The Technical Specifications Appendix B requires a quarterly visual inspection of the water course with documentation of channeling or erosion wherein vertical cuts greater than 2 feet or lateral washouts greater than 5 feet are corrected. A baseline inspection with photographs taken at specific reference points has been used for comparison purposes during the quarterly inspections. No channeling or erosion in excess of limits was noted in 1980.

.2 Drift Contaminants

The Technical Specifications Appendix B requires that three soil samples be taken symmetrically 0.25 miles from the cooling towers and the leachable sulfate content of those samples measured. If levels exceed 1500 ppm, a report is required. Soil samples were taken each quarter and have shown consistently low sulfate contents, on the order of 50 ppm.

.3 Liquid Effluent Contaminants

The Technical Specifications Appendix B requires three soil samples taken in downstream locations in which plant effluent is used for irrigation purposes. Similar to .2 above, leachable sulfate exceeding 1500 ppm requires reporting. The quarterly samples taken in this program in 1980 showed consistently low results, on the order of 50 ppm.

A "special requirement" under Technical Specifications Appendix B is related to chemicals in waste discharges. Purchased chemicals that are released from processes, and naturally occurring impurities in raw water that are concentrated by cooling tower operation must be computed on a semiannual basis and compared to a list of quantities predicted from plant design. Actual discharges in excess of design must be described in this report. Table 3 provides the 1980 calculated discharges and compares them to the Technical Specifications. Design estimate of the chlorine discharged was exceeded during 1980; this is a result of high effluent flow rates and high summer chlorination rates in the circulating water. It is likely that the design estimate was an underestimate for years of high water usage.

.4 Noise

The Technical Specifications Appendix B requires that during plant startup and semiannually thereafter, noise level measurements will be made at 200-yard intervals along the site boundary, with detailed log records of the measurements. If noise levels exceed an occupancy vs decibel curve labeled "normally acceptable," corrective action is called for. A "clearly unacceptable" curve requires reporting action. The two noise surveys performed in 1980 indicated no sound levels higher than the "normally acceptable" state, and ranging from 33 to 43 decibels.

.5 Fogging

The Technical Specification Appendix B requires that the thermal plume from cooling tower operation, when observed intersecting Highway 104 will result in actions to provide warning of impaired visibility to motorists. There was no record of local fogging as noted by log records by each operating shift in 1980.

.6 Reservoir Drawdown

The Technical Specifications Appendix B required that, except for certain operational requirements or for the Sacramento County Parks Department needs in maintenance, the Rancho Seco Reservoir will remain above the elevation of 239 feet. Exceptional periods limit the elevation to be above 237 feet unless a State agency provides consent. In 1980, the level was manipulated on certain allowable days during the year to the 237-foot elevation for Park Department weed abatement work.

TABLE 3

ANNUAL CHEMICAL RELEASES IN LIQUID EFFLUENTS

	1980 Releases		Tech Spec Design Estimate	
Chemical	Total Lbs.	Avg mg/l	Total Lbs.	Avg mg/l
Na	7.6×10^4	7.0	1.45×10^5	39.0
SO_4	7.9×10^5	68	1.60×10^6	431
Al	4.2×10^3	0.41	4.0×10^4	1.7
NH_3	2.2×10^4	2.3	5.2×10^4	14.0
Zn	$<9.1 \times 10^2$	<0.10	1.0×10^3	~0.3
B	$<1.1 \times 10^3$	<0.10	2.0×10^3	~0.6
Cl_2	1.1×10^3	<0.10	7.5×10^2	<0.2

C. RADIOLOGICAL ENVIRONMENTAL MONITORING

.1 Fish

Samples of bass and red-ear sunfish were removed from Rancho Seco Reservoir each quarter. Flesh was analyzed for gross beta activity minus K-40, K-40 and Sr-90. Data is given in Tables 4 through 7. The sample of sunfish taken in the second quarter had a positive beta result and one of the samples in each of the first, second and fourth quarters had a positive Sr-90 value. There is no apparent species variability in any of the measurements, and none of the activities measured was significant. No reporting level under Technical Specifications was exceeded.

.2 Algae and Other Aquatic Plants

Samples of algae and associated plant material were taken from the waste water course at the SMUD property line each quarter. Samples were analyzed for gross beta minus K-40, K-40, Sr-90 and gamma emitters. Data is given in Tables 4 through 7. All algae analyzed in 1980 showed gross beta, K-40 and Sr-90 activities very comparable to previous years, including the pre-operating period. Gamma spectrometric results showed Be-7, Cs-137, and other isotopes associated with natural background or fallout. The liquid activity released in January, 1980 thus was too small to be detected in this sensitive monitoring medium.

.3 Surface and Runoff Water

Area runoff water, including the plant waste water, was sampled every two weeks for detection of gross beta and gamma emitter activity of both dissolved and suspended material, detection of tritium, and detection of I-131. On a monthly basis, samples were taken of two reservoirs and the Folsom South Canal, with analytical work similar to that described but no gamma spectrometry. The data is provided in Tables 4 through 7. No samples gave analysis results significantly different from prior years' results or exceeding reporting requirements of Technical Specifications. There was one runoff sample on March 18 that showed a detectable amount of Fe-59 in the suspended fraction. Naturally occurring Ra-226 was detected in a January 8 sample. The analysis of I-131 at 0.5 pCi/l sensitivity gave one positive indication in a surface water sample; no baseline is available for evaluation of this measurement.

.4 Mud and Silt

Samples from shallow water areas at Rancho Seco Reservoir and the waste water course at the SMUD property line were removed each quarter for gross beta activity analysis. The data is presented in Tables 4 through 7 and is consistent with previous years' data. No reporting levels were exceeded.

.5 Fresh Milk

Milk samples were collected from four locations on a weekly basis. Three sites are commercial dairy herds, the fourth is a single family cow. All samples were analyzed for I-131. On a monthly basis, the milk sample taken concurrent with an animal vegetation sample was analyzed for Sr-90. The data is presented in Tables 4 through 7. Ten samples had detectable levels of I-131 during the year; this number of positive indications is significantly below the 1979 experience, but consistent with other prior years' experience. The absolute values did not require specific reporting and actions under Technical Specifications. It appears that the single family cow may be statistically higher than the other sites on a long-term average basis for Sr-90.

.6 Rabbits

Jackrabbits were removed from local roads for analysis with two samples being dissected each quarter. Flesh was analyzed for gross beta minus K-40, and K-40 activity; femurs were analyzed for Sr-90 and stable Ca content; thyroids were analyzed for I-131. Tables 4 through 7 provide data. No gross beta in the flesh, and no I-131 in thyroids is quite consistent with previous years' results; the Sr-90, and K-40 values were all similar to previous measurements. No Technical Specification reporting values were exceeded.

.7 Edible Vegetation

Animal edible vegetation was collected each month at the milk sampling locations, with the assumption that the grasses collected are representative of the cows' diet. Samples were analyzed for gross beta minus K-40, K-40 and Sr-90. The data is presented in Tables 4 through 7. As in the past, little or no beta activity was found in excess of the K-40 concentration and small concentrations of Sr-90

are found at all locations; there is no correlation of higher Sr-90 levels at the single family cow site as might be expected from milk analyses.

Human edible vegetation samples were collected only in the second and third quarters, during harvest; data is found in Tables 5 and 6. Fleshy, root, and some leafy crops were sampled as available in four directions from the site. Gross beta minus K-40 and K-40 results were all similar to previous years' data, were below Technical Specification reporting levels and were not significant.

.8 Well Water

Samples of water were taken each quarter from four wells near Rancho Seco. They were analyzed for tritium, iodine-131 and gross beta activity. All data is presented in Tables 4 through 7. No tritium or iodine was detected and gross beta data were in the range of values observed in all previous years. No values exceeded Technical Specification reporting requirements.

.9 Drinking Water

Domestic water supplied on site from a well was sampled monthly to ensure no well contamination or cross connection to plant systems. The domestic supply (which also connects to some lawn irrigation) was transferred to a service water supply during several periods of construction activity; no human consumptive usage was made during these periods. Samples were analyzed for gross beta, tritium, and iodine. No tritium or I-131 was detected, and the gross beta results were comparable to all prior drinking water samples and also comparable to other wells in the area.

.10 Airborne Particulate and Iodine

Eight stations collect air particulates and iodines on filter assemblies using 1 cfm continuously operating devices. Weekly the filters were replaced and the collected material analyzed for gross beta activity and I-131. The particulate filters were composited for each quarter and analyzed for gross alpha activity and gamma emitters by gamma spectrometry. The particulate and charcoal filters were generally analyzed within nine days of collection. Thirty four samples were reported to have high flow volume (generally a result of operating two weeks between change) and five had low flow volume (usually a power failure); four were not included in the quarterly average data presented in Tables 4 through 7. Gross beta results indicate that fallout from atmospheric testing in 1976 and 1977 had generally bottomed out during 1979 and 1980,

until recent atmospheric tests in China made another measurable increase in background. All stations are clearly recording the same phenomena and no site indicates beta or gamma spectrometric activity attributable to plant operation. No alpha activity was observed in any composite analyzed.

Forty three charcoal filters had detectable I-131, with two samples exceeding the Technical Specification reporting requirement (Section C.12). There appears to be no site correlation of detected iodine; i.e., no sample station has a significantly higher number of positive indications. There does appear to be a time correlation of significance; i.e., several locations detect iodine in the same week. Since the measured iodine values are generally close to the detection level, the time correlation might also be an indication of background variance in the counting system performing the analysis. The detection of I-131 at most stations in early November may indicate contribution of the Chinese test in October.

.11 Direct Radiation

Thermoluminescent dosimeters were placed at 18 locations within an approximately 10-mile radius of the site, and one reference location at 22 miles. In early July, 43 additional TLD monitoring locations were established as required by the Nuclear Regulatory Commission. Since there is no pre-operational background established for these new locations, the added program is reported separately as Post-TMI data with no reporting levels under Technical Specifications.

TLD's were replaced each quarter and analyzed by reading at least four separate chips from each site and treating them statistically for the best value. Tables 4 through 7 report the average and 2σ variance for each site. Six packets were not found and were either vandalized or lost during high winds.

The North and West fence monitoring locations indicated results higher than the Technical Specification reporting levels in the second quarter of 1980 (See Section C12), due to storage of radioactive waste drums in preparation for disposal.

In the third quarter, all 19 of the TLD stations in the

original monitoring program showed higher results than normal, with six locations exceeding the Technical Specification reporting levels. The West fence monitored location was again a high result and could be attributed to stored radioactive wastes; other high locations were determined not the result of plant sources, but an inadvertent exposure by x rays (Section C 12).

In the fourth quarter, the West fence location was again higher than normal and was reportable under Technical Specifications (Section C 12); increased surveillance of the radwaste storage facility indicated that most of the fourth quarter fenceline exposure occurred in October as waste shipments were being performed.

.12 Supplemental Information

Under Technical Specifications for Radiological Environmental Monitoring, certain review and reporting requirements are associated with the exceeding of specific radioactivity levels in each type of environmental sample analyzed. The reporting levels were established as being above the normal range of background concentrations, or when specific gamma emitting radioisotopes are clearly above a fixed detectable concentration (three times the minimum sensitivity).

a. In all quarters, many of the quarterly composited air particulate filters contained Be-7 in excess of three times the minimum sensitivity; throughout the year several samples contained K-40 in excess of three times minimum sensitivity. These isotopes are naturally produced. Pb-214, Bi-214 and Ru-106 were detected in one or two samples; the sources are natural or related to atmospheric testing of weapons.

b. Two charcoal filter samples (which are removed on a weekly basis from eight air sampling stations) had I-131 contents in excess of the Technical Specification level of 40 fCi/m^3, which requires discussion in this report. Both of these samples were taken during the week of February 12, 1980. Although these samples had no clear time correlation with known releases of radioactivity from Rancho Seco, there were gaseous releases that contained low concentrations of I-131; thus it is assumed that the air sampling program is effectively detecting low concentrations of this radioisotope (during release, the exhaust concentrations are general in the range 10^{-12} to 10^{-10} uCi/cc).

c. In the second quarter, two of the environmental TLD badges located on the perimeter fence indicated total doses greater than 10 mR above natural background. The North fence TLD indicated a total dose of 54.4 mR and the West fence TLD indicated a total dose of 41.7 mR. Report level values were 27.0 and 27.5 mR respectively, based on preoperational monitoring. The cause of high readings was accumulated radwaste in a drum storage location near the West fence and two trailers containing outage equipment parked near the North fence. Immediate corrective actions included relocation of the trailers and an effort to shield stored drums. Emphasis was placed on expediting removal of radwaste to burial sites.

d. In the third quarter, six environmental TLD locations exceeded the Technical Specification reporting levels, and all 19 of the TLDs from the original monitoring program were higher than normal. In an effort to substantiate the readings, the post-TMI TLD locations (43 new monitoring locations) were immediately changed out, none of them indicating as high values as the set of 19. Several locations are also monitored by the NRC and the California Department of Health in separate programs; inquiry into the results of these monitors indicated no abnormal readings. Some qualitative testing was performed to determine if temperature or light sensitivity (e.g. arc welding) might affect the TLD readings. Finally, it was determined that the box of collected badges had been passed through the Security x-ray machine when brought onto site. Testing a random collection of badges indicated that readings from 0 to 35 mR could be induced by passage through this machine. Corrective action then consisted of training individuals responsible for environmental work to have physical inspection of the TLD by Security forces. A related question of how personnel film badges are delivered to the site was raised and measures were instituted to insure against their passage through the Security x-ray machine.

e. In the fourth quarter, the West fence TLD badge indicated again higher exposure than the Technical Specification reporting level. The reading of 29.5 mR was slightly in excess of the 27.5 mR reporting requirement. During the third and fourth quarters additional monitoring had been placed around the radwaste drum storage area with monthly readings taken. It was evident from this data that waste shipments made in October had contributed some exposure dose during the handling and loading operations.

In order to completely remove the stored wastes as a potential source for concern, it was necessary to locate a vendor service with proper shielded shipping containers; cask availability in 1980 was very limited and the opportunity to remove Type A quantity containers did not arise until January 1981.

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPOPTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	FISH	pCi/g (DRY)	Q/G
Location and Type	Beta less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Site Reservoir Red Ear Sunfish	0	10.8	0.05 ± 0.03
Site Reservoir Bass	0	11.6	0

	ALGAE	pCi/g (DRY)	Q/G
Location	Beta less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Mixed Effluent (Site Boundary)	1.7 ± 0.05	2.7	1.98 ± 0.37

GAMMA SPECTROMETRY

Pb-214 0.071*	Bi-214 0.116*	Co-60 0.063*	Mn-54 0.021*	Ru,Rh-106 0.143*	Zn-65 0.060*	Zr,Nb-95 0.066*	Ce-144 0.121*	Cs-137 0.056*	Co-58 0.017*	Cs-134 0.029*	Be-7 0.236*
1.49	1.04	**	**	**	**	**	**	0.67	**	**	**

*Detection Limit
**Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1st QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	SURFACE WATER	pCi/l M/G		
Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine-131 0.5*
Camanche Reservoir (3 samples)	0	0.4 ± 0.4	0.9 ± 0.4	0
Folsom Canal (3 samples)	0	0.5 ± 0.5	0.3 ± 0.5	0
Site Reservoir (3 samples)	0	0.2 ± 0.5	1.8 ± 0.4	0

	RUNOFF WATER	pCi/l F/G		
Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine-131 0.5*
Mixed Effluent (Site Boundary) 6 samples	0	0.9 ± 0.5	2.2 ± 0.5	0

		Gamma Spectrometry pCi/l
1-8-80 sample	Ra-226	170 ± 54 (dissolved)
3-18-80 sample	Fe-59	26.7 ± 9.7 (suspended)

*Detection Limit
**Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	MUD AND SILT	pCi/G (DRY)	Q/G
Location	Gross Beta 0.05*		
Site Reservoir	1.9 ± 0.1		
Mixed Effluent (Site Boundary)	1.8 ± 0.1		

	FRESH MILK	pCi/l	W/G
Location	I-131 (3 Sample Avg) 0.5*	Sr-90 (3 Sample Avg) 1.0*	
Souza Dairy	0.2	0.9	
Borges Dairy	0.0	0.6	
Warmerdam Dairy	0.0	0.3	
Marciel Ranch	0.2	1.9	

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Morthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composit

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	RABBIT FLESH	pCi/g (DRY)	Q/G
	Beta Less K-40	K-40	
Location	0.02*	.001*	
Rancho Seco Site (2 samples)	0	10.4	

	RABBIT FEMUR	pCi/G (WET)	Q/G
	Sr-90	Ca	
Location	0.03*	mg/g	
Rancho Seco Site (2 samples)	1.0 ± 0.05	84	

	RABBIT THYROID	pCi/G (WET)	Q/G
	I-131		
Location	0.05*		
Rancho Seco Site (2 samples)	0		

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composit

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	ANIMAL VEGETATION pCi/g (DRY)		M/G
Location	Beta Less K-40 0.02*	K-40 .001*	Sr-90 0.03*
Warmerdam Dairy (3 Sample Avg)	0	13	0.10
Souza Dairy (3 Sample Avg)	0	17	0.34
Borges Dairy (3 Sample Avg)	0	13	0.07
Marciel Ranch (3 Sample Avg)	0	22	0.17

HUMAN VEGETATION pCi/G (DRY) S/G

No samples available.

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grad, C-Continuous, C'-Composite

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	WELL WATER	pCi/l	Q/C
Location	H-3 250*	Beta 0.5*	Iodine-131 0.5*
Clay Well	0	0	0
Reservoir Area Well	0	1.7 ± 0.4	0
Clay Cattle Co. Well	0	1.9 ± 0.4	0
Site Well	0	2.4 ± 0.4	0

	DRINKING WATER	pCi/l	M/G
Location	H-3 250*	Beta 0.5*	Iodine-131 0.5*
Site Drinking Fountains (3 samples)	0	1.3± 0.4	0

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-132

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

AIRBORNE PARTICULATE AND IODINE pCi/m^3

Location	Air Particulate W/C Gross Beta .002*	Air Particulates Q/C' Alpha .005*	Charcoal Filters W/C I-131 .004*
Site A	0.017	0	0.007
Site B	0.016	0	0.006
Site C	0.025	0	0.001
Site D	0.028	0	0.001
Site E	0.021	0	0
Site F	0.019	0	0.001
Site G	0.017	0	0.001
Site H	0.020	0	0.001

AIR PARTICULATE GAMMA SPECTROMETRY Q/C' pCi/m^3

Location	Be-7 .007*	K-40 0.115*	Pb-214 0.003*	Bi-214 0.005*	Ru-106 0.004*
Site A	0.042	0.274	0.003	0.006	
Site B	0.064				
Site C		0.161			
Site D	0.075				0.030
Site E	0.121				
Site F	0.069				
Site G	0.043				
Site H	0.078				

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 4

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 1ST QUARTER, 1980

AVERAGE QUARTERLY RESULTS

DIRECT RADIATION mrem/Qtr. Q/C

Location	TLD Rdg. - mrem
N. Perimeter Fence	Lost
E. Perimeter Fence	14.0 ± 2.2
W. Perimeter Fence	18.4 ± 1.2
S. W. Perimeter Fence	13.3 ± 0.4
S. E. Perimeter Fence	15.5 ± 1.8
Visitors Center	13.1 ± 1.6
Rt. 104 Entrance	Lost
N. W. of Site (6 Miles)	15.9 ± 3.4
N. W. of Site, Sacramento (22 Miles)	13.6 ± 2.6
S. W. of Site, Lodi (17 Miles)	Lost
S. of Site (0.25 Miles)	14.4 ± 5.6
E. of Site, Ione (11 Miles)	12.3 ± 1.0
W. Milk Station (10 Miles)	Lost
S. W. of Site, Galt (11 Miles)	16.5 ± 6.3
S. E. of Site, Camanche (11 Miles)	15.4 ± 3.3
W. of Site, Clay (1.5 Miles)	11.4 ± 0.7
S. W. Milk Station (9 Miles)	14.4 ± 1.3
N. E. of Site (8 Miles)	12.7 ± 0.5
S. E. of Site (1 Mile)	13.5 ± 0.8

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnight, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	FISH pCi/g (DRY)	Q/G	
Location and Type	Beta Less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Site Reservoir Red Ear Sunfish	0.5 ± 0.4	3.8	0
Site Reservoir Bass	0	3.9	0.18 ± 0.10

	ALGAE p/Ci/G (DRY)	Q/G	
Location	Beta less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Mixed Effluent (Site Boundary)	2.3 ± 0.5	1.9	1.17 ± 0.19

Gamma Spectrometry

Ba-140 0.075*	Co-60 0.063*	Pb-212 0.870*	Mn-54 0.021*	Ru-106 0.143*	Zn-65 0.060*	Zr-05 0.066*	Ce-144 0.121*	Cs-137 0.056*	Co-58 0.017*	Be-7 0.236*	Cs-134 0.029*
**	**	1.02	**	**	**	**	**	1.13	**	8.05	**

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILTIY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

SURFACE WATER pCi/l M/G

Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine 131 0.5*
Camanche Reservoir (3 samples)	0	0.2 ± 0.4	1.8 ± 0.4	0.3 ± 0.5
Folsom Canal (3 samples)	0	0	1.5 ± 0.4	0
Site Reservoir (3 samples)	0	0.7 ± 0.5	4.9 ± 0.8	0

RUNOFF WATER pCi/l F/g

Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine 131 0.5*
Mixed Effluent (Site Boundary) 6 samples	0	2.0 ± 1.9	1.1 ± 0.4	0

Gamma Spectrometry

No isotopes detected

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	MUD AND SILT	pCi/g (DRY)	Q/G
Location	Gross Beta 0.05*		
Site Reservoir	3.09 ± 0.43		
Mixed Effluent (Site Boundary)	1.89 ± 0.40		

	FRESH MILK	pCi/l	W/G
Location	1-131 (13 sample Avg) 0.5*		Sr-90 (3 Sample Avg) 1.0*
Souza Dairy	0.1		0.7
Borges Dairy	0.0		0
Warmerdam Dairy	0		1.3
Marciel Ranch	0		4.0

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	RABBIT FLESH	pCi/g (DRY)	Q/G
	Beta Less K-40	K-40	
Location	0.02*	.001*	
Rancho Seco Site (2 samples)	0	6	

	RABBIT FEMUR	pCi/G (WET)	Q/G
	Sr-90	Ca	
Location	0.03*	mg/g	
Rancho Seco Site (2 samples)	2.35 ± 1.05	1.8	

	RABBIT THYROID	pCi/g (WET)	Q/G
	I-131		
Location	0.05*		
Rancho Seco Site (2 Samples)	0		

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

ANIMAL VEGETATION pCi/g (DRY) M/G

Location	Beta Less K-40 0.02*	K-40 .001*	Sr-90 0.03*
Warmerdam Dairy (3 Sample Avg)	0	16.1	0.27
Souza Dairy (3 Sample Avg)	0	13.6	1.86
Borges Dairy (3 Sample Avg)	0	12.1	0.27
Marciel Ranch (3 Sample Avg)	0	10.2	0.71

HUMAN VEGETATION pCi/G (DRY) S/G

Location	Type	Beta Less K-40 0.02*	K-40 .001*
Clay Area	Potatoes, squash, lettuce, turnips	0	43
Clements Area	Squash, turnips, celery	0	34
Ione Area	Potatoes, squash, tomatoes	0	19
Sloughhouse	Potatoes, tomatoes	0	28

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	WELL WATER	pCi/l	Q/C
Location	H-3 250*	Beta 0.5*	Iodine-131 0.5*
Clay Well	0	0.0 ± 0.3	0
Reservoir Area Well	0	1.7 ± 0.4	0
Clay Cattle Co. Well	0	0.7 ± 0.3	0
Site Well	0	3.5 ± 0.4	0

	DRINKING WATER	pCi/l	M/G
Location	H-3 250*	Beta 0.5*	Iodine-131 0.5*
Site Drinking Fountains (3 samples)	0	1.9 ± 0.4	0

* Detection Limit

** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

AIRBORNE PARTICULATE AND IODINE pCi/m^3

LOCATION	Air Particulate W/C Gross Beta .002	Air Particulates Q/C' Alpha .005*	Charcoal Filters W/C I-131 .004*
Site A	0.014	0	0.001
Site B	0.011	0	0.001
Site C	0.008	0	0
Site D	0.015	0	0.001
Site E	0.016	0	0
Site F	0.017	0	0
Site G	0.014	0	0
Site H	0.015	0	0

AIR PARTICULATE GAMMA SPECTROMETRY Q/C' pCi/m^3

LOCATION	Be-7 .007*	K-40 0.115*	Bi-214 0.005*	Pb-214 0.003*
Site A	0.015	0.37		
Site B		0.13	0.01	
Site C	0.018	0.44		
Site D				
Site E	0.019	0.33		
Site F				
Site G	0.009	0.42	0.02	0.02
Site H				

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 5

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 2ND QUARTER, 1980

AVERAGE QUARTERLY RESULTS

DIRECT RADIATION mrem/Qtr. Q/C

Location	TLD Rdg. - mrem
N. Perimeter Fence	54.4 ± 2.4
E. Perimeter Fence	18.1 ± 1.1
W. Perimeter Fence	41.7 ± 6.0
S. W. Perimeter Fence	19.8 ± 2.5
S. E. Perimeter Fence	18.3 ± 2.4
Visitors Center	17.1 ± 2.7
Rt. 104 Entrance	18.6 ± 1.3
N. W. of Site (6 Miles)	18.0 ± 3.1
N. W. of Site, Sacramento (22 Miles)	17.5 ± 0.5
S. W. of Site, Lodi (17 Miles)	22.1 ± 1.8
S. of Site (0.25 Miles)	16.1 ± 2.0
E. of Site, Ione (11 Miles)	16.4 ± 1.1
W. Milk Station (10 Miles)	15.7 ± 1.6
S. W. of Site, Galt (11 Miles)	18.2 ± 2.7
S. E. of Site, Camanche (11 Miles)	16.8 ± 2.4
W. of Site, Clay (1.5 Miles)	13.7 ± 1.9
S. W. Milk Station (9 Miles)	17.9 ± 1.5
N. E. of Site (8 Miles)	16.1 ± 3.0
S. E. of Site (1 Mile)	14.8 ± 1.4

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 198

AVERAGE QUARTERLY RESULTS

	FISH pCi/G (DRY)		Q/C	
Location and Type	Beta less K-40 0.02*		K-40 0.001*	Sr-90 0.03*
Site Reservoir Red Ear Sunfish	0		13.0	0
Site Reservoir Bass	0		9.9	0

	ALGAE pCi/g (DRY)		Q/C	
Location	Beta less K-40 0.02*		K-40 0.001*	Sr-90 0.03*
Mixed Effluent (Site Boundary)	4.56 ± 0.81		2.3	1.37 ± 0.18

Gamma Spectrometry

Ba-140 .075*	Co-60 .063*	Pb-212 .024*	Mn-54 .021*	Ru-106 .143*	Zn-65 .060*	Zr-95 .066*	Cs-137 .417*	Cs-134 .370*	Co-58 .017*	Be-7 .236
**	**	**	**	**	**	**	2.21	0.80	**	**

* Detection Limit
** Below Detection Limit

FREQUENCY; W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-132

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

SURFACE WATER pCi/l M/G

Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine 131 0.5*
Camanche Reservoir (3 samples)	0	0.3 ± 0.5	3.3 ± 0.6	0
Folsom Canal (3 samples)	0	0.2 ± 0.5	4.6 ± 0.7	0
Site Reservoir (3 samples)	0	0.2 ± 0.5	3.1 ± 0.5	0

RUNOFF WATER pCi/l F/G

Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	Iodine 131 0.5*
Mixed Effluent (Site Boundary) (7 samples)	0	0.6 ± 0.5	2.2 ± 0.6	0

Gamma Spectrometry

No isotopes detectable in suspended or dissolved fractions.

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	MUD AND SILT	pCi/g (DRY)	Q/G
Location	Gross Beta 0.05*		
Site Reservoir	3.5 ± 0.6		
Mixed Effluent (Site Boundary)	3.4 ± 0.6		

	FRESH MILK	pCi/l	W/G
Location	I-131 (14 Sample Avg) 0.5*	Sr-90 (3 Sample Avg) 1.0*	
Souza Dairy	0	1.7	
Borges Dairy	0	0.3	
Warmerdam Dairy	0.2	1.9	
Marciel Ranch	0	6.3	

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	RABBIT FLESH	pCi/G (DRY)	Q/G
	Beta Less K-40	K-40	
Location	0.02*	.001*	
Rancho Seco Site (2 Samples)	0	8	

	RABBIT FEMUR	pCi/G (WET)	Q/G
	Sr-90	Ca	
Location	0.03*	mg/g	
Rancho Seco Site (2 Samples)	0.63 ± 0.40	232	

	RABBIT THYROID	pCi/G (WET)	Q/C
	I-131		
Location	0.05*		
Rancho Seco Site (2 Samples)	0		

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

ANIMAL VEGETATION pCi/G (DRY) M/G

Location	Beta Less K-40 0.02*	K-40 .001*	Sr-90 0.03*
Warmerdam Dairy (3 Sample Avg)	0	20.1	0.16
Souza Dairy (3 Sample Avg)	0	8.9	0.02
Borges Dairy (3 Sample Avg)	0	15.5	.5
Marciel Ranch (3 Sample Avg)	0	13.4	0.60

HUMAN VEGETATION pCi/g (DRY) S/G

Location	Type	Beta Less K-40 0.02*	K-40 .001*
Sloughhouse	Squash, potatoes	0	34
Clements Area	Squash, potatoes, turnips	0	21
Ione Area	Rhubarb	0	25
Clay Area	Squash, potatoes, turnips	0	30

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	WELL WATER	pCi/l	Q/C
Location	H-3 250*	Beta 0.5*	Iodine 131 0.5*
Clay Well	0	2.8 ± 1.2	0
Reservoir Area Well	0	2.1 ± 0.6	0
Clay Cattle Co. Well	0	1.6 ± 0.5	0
Site Well	0	2.6 ± 0.4	0

	DRINKING WATER	pCi/l	M/G
Location	H-3 250*	Beta 0.5*	Iodine 131 0.5*
Site Drinking Fountains (3 Samples)	0	2.9 ± 0.6	0

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

AIRBORNE PARTICULATE AND IODINE pCi/m^3

Location	Air Particulate W/C Gross Beta .002*	Air Particulates Q/C' Alpha .06*	Charcoal Filters W/C I-131 .004*
Site A	0.017	0	0.002
Site B	0.012	0	0.003
Site C	0.013	0	0.001
Site D	0.017	0	0.004
Site E	0.021	0	0
Site F	0.024	0	0.006
Site G	0.018	0	0.001
Site H	0.014	0	0.002

AIR PARTICULATE GAMMA SPECTROMETRY Q/C' pCi/m^3

Location	Be-7 0.007*	K-40 0.115*
Site A	0.015	0.49
Site C		0.45
Site E	0.025	0.45
Site G		0.27

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually
TYPE: G-Grab, C-Continuous- C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

DIRECT RADIATION	mrem/Qtr.	Q/C
Location	TLD Rdg. - mrem	
N. Perimeter Fence	22.6 ± 0.2	
E. Perimeter Fence	22.7 ± 3.1	
W. Perimeter Fence	29.8 ± 2.2	
S. W. Perimeter Fence	21.1 ± 0.8	
S. E. Perimeter Fence	23.7 ± 2.1	
Visitors Center	34.0 ± 4.4	
Rt. 104 Entrance	23.4 ± 4.7	
N. W. of Site (6 Miles)	24.3 ± 2.5	
N. W. of Site, Sacramento (22 Miles)	26.0 ± 5.8	
S. W. of Site, Lodi (17 Miles)	31.8 ± 19.5	
S. of Site (0.25 miles)	21.3 ± 1.4	
E. of Site, Ione (11 Miles)	23.8 ± 3.1	
W. Milk Station (10 Miles)	24.0 ± 2.6	
S. W. of Site, Galt (11 Miles)	27.1 ± 0.9	
S. E. of Site, Camanche (11 Miles)	25.9 ± 4.3	
W. of Site, Clay (1.5 Miles)	32.1 ± 9.9	
S. W. Milk Station (9 Miles)	46.1 ± 2.3	
N. E. of Site (8 Miles)	25.3 ± 1.9	
S. E. of Site (1 Mile)	34.2 ± 4.1	

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 6

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-132

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 3RD QUARTER, 1980

AVERAGE QUARTERLY RESULTS

POST-TMI-DIRECT RADIATION	mrem/Qtr.	Q/C
Location	TLD Rdg. - mrem	
WSW of Site (1.5 miles)	15.3 ± 0.8	
SW of Site (1.7 miles)	16.5 ± 0.4	
S of Site (1.8 miles)	16.2 ± 0.4	
SSW of Site (1.8 miles)	17.2 ± 0.7	
SSE of Site (1.8 miles)	17.5 ± 1.5	
SW of Site (3.8 miles)	18.4 ± 1.9	
SSW of Site (3.9 miles)	17.0 ± 1.3	
S of Site (3.6 miles)	19.1 ± 0.2	
SSE of Site (3.7 miles)	18.2 ± 0.5	
S of Site (4.2 miles)	19.5 ± 0.5	
WSW of Site (7.4 miles)	20.7 ± 0.3	
W of Site (3.7 miles)	18.6 ± 0.6	
WNW of Site (4.8 miles)	19.6 ± 0.6	
WSW of Site (3.8 miles)	19.0 ± 0.5	
NW of Site (3.8 miles)	20.4 ± 1.3	
W of Site (1.9 miles)	21.2 ± 1.3	
WNW of Site (1.6 miles)	19.4 ± 1.2	
NW of Site (1.9 miles)	21.2 ± 1.2	
NNW of Site (1.6 miles)	19.7 ± 1.5	
NNE of Site (1.5 miles)	18.4 ± 0.8	
N of Site (1.5 miles)	19.7 ± 1.0	
NE of Site (2.0 miles)	25.9 ± 1.1	
SE of Site (4.4 miles)	18.5 ± 0.7	
SE of Site (1.6 miles)	17.7 ± 1.2	
E of Site (1.4 miles)	17.3 ± 0.7	
ESE of Site (1.4 miles)	17.9 ± 2.2	
ENE of Site (1.3 miles)	19.4 ± 0.4	
NE of Site (3 miles)	20.6 ± 1.2	
ENE of Site (3.5 miles)	22.1 ± 0.3	
E of Site (3.1 miles)	19.1 ± 1.9	
ESE of Site (3.5 miles)	23.7 ± 2.3	
E of Site Ione (11 miles)	23.2 ± 1.8	
E of Site Jackson (19 miles)	26.2 ± 0.9	
SE of Site (11 miles)	23.0 ± 0.6	
S of Site Clements (10 miles)	23.2 ± 1.4	
WNW of Site (8.0 miles)	20.0 ± 1.4	
NNW of Site (4.6 miles)	6.2 ± 0.6	
N of Site 67.6 miles)	Future Location	
NNE of Site (6.6 miles)	Lost	
NNW of Site Sloughouse (11.3 miles)	18.8 ± 2.3	
N of Site Rancho Murietta (10.6 miles)	20.1 ± 0.1	
WNW of Site Elk Grove (13 miles)	22.3 ± 2.0	
SW of Site Galt (11 miles)	22.4 ± 0.9	

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually
TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	FISH	pCi/g (DRY)	Q/G
Location and Type	Beta less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Site Reservoir Red Ear Sunfish	0	17.6	0.65
Site Reservoir Bass	0	13.0	0

	ALGAE	pCi/G (DRY)	Q/G
Location	Beta Less K-40 0.02*	K-40 0.001*	Sr-90 0.03*
Mixed Effluent (Site Boundary)	1.95 ± 0.67	2.1	0

Gamma Spectrometry

Ba-140 .075*	Co-60 .063*	I-131 .024*	Mn-54 .021*	Ru-106 .143*	Zn-65 .060*	Zr-95 .066*	Cs-137 .056*	Ce-144 .121*	Co-58 .017*	Be-7 .236
**	**	**	**	**	**	**	0.71	**	**	0.27

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	SURFACE WATER pCi/l		M/G	
Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	I-131 0.5*
Camanche Reservoir (3 samples)	0	0	2.0 ± 0.5	0
Folsom Canal (3 samples)	0	0	1.1 ± 0.5	0
Site Reservoir (3 samples)	0	0.2 ± 0.5	1.2 ± 0.5	0

	RUNOFF WATER pCi/l		F/G	
Location	H-3 250*	Beta (Suspended) 0.5*	Beta (Dissolved) 0.5*	I-131 0.5*
Mixed Effluent (Site Boundary) (7 samples)	0	0.9 ± 0.5	2.0 ± 0.6	0

Gamma Spectrometry

No isotopes detectable in suspended or dissolved fractions.

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	MUD AND SILT	pCi/g (DRY)	Q/G
Location	Gross Beta 0.05*		
Site Reservoir	1.8 ± 0.6		
Mixed Effluent (Site Boundary)	1.4 ± 0.6		

	FRESH MILK	pCi/l	W/G
Location	I-131 (13 Sample Avg) 0.5*		Sr-90 (3 Sample Avg) 1.0*
Souza Dairy	0		1.3
Borges Dairy	0		0.8
Warmerdam Dairy	0		0.6
Marciel Ranch	0		2.2

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	RABBIT FLESH	pCi/g (DRY)	Q/G
Location	Beta Less K-40 0.02*	K-40 .001*	
Rancho Seco Site (2 samples)	0	15.7	

	RABBIT FEMUR	pCi/g (WET)	Q/G
Location	Sr-90 0.03*	Ca mg/g	
Rancho Seco Site (2 samples)	0.68 ± 0.07	355	

	RABBIT THYROID	pCi/g (WET)	Q/C
Location	I-131 0.05*		
Rancho Seco Site (2 samples)	0		

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually
TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

ANIMAL VEGETATION pCi/G (DRY) M/G

Location	Beta Less K-40 0.02*	K-40 .001*	Sr-90 0.03*
Warmerdam Dairy (3 sample Avg)	0	21.7	0.15
Souza Dairy (3 sample Avg)	0	17.9	0.27
Borges Dairy (3 sample Avg)	0	13.0	0.16
Marciel Ranch (3 Sample Avg)	0	35.7	0.19

HUMAN VEGETATION pCi/G (DRY) S/G

No samples available

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

	WELL WATER pCi/l		Q/C
Location	H-3 250*	Beta 0.5*	I-131 0.5*
Clay Well	0	1.4 ± 0.5	0
Reservoir Area Well	0	1.9 ± 0.6	0
Clay Cattle Co. Well	0	2.1 ± 0.6	0
Site Well	0	2.8 ± 2.0	0

	DRINKING WATER pCi/l		M/G
Location	H-3 250*	Beta 0.5*	I-131 0.5*
Site Drinking Fountains (3 Samples)	0	1.7 ± 0.6	0

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

AIRBORNE PARTICULATE AND IODINE pCi/m^3

LOCATION	AIR PARTICULATE W/C Gross Beta .002*	AIR PARTICULATES Q/C' Alpha .005*	CHARCOAL FILTERS W/C I-131 .004*
Site A	0.065	0	0.002
Site B	0.064	0	0.002
Site C	0.038	0	0.002
Site D	0.086	0	0.001
Site E	0.121	0	0.001
Site F	0.098	0	0.002
Site G	0.053	0	0
Site H	0.075	0	0.002

AIR PARTICULATE GAMMA SPECTROMETRY Q/c' pCi/m^3

Location	Be-7 0.007*	K-40 0.115*
Site A		
Site B	0.020	
Site C		
Site D		
Site E	0.011	1.20
Site F		
Site G		0.33
Site H	0.020	

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

DIRECT RADIATION mrem/Qtr. Q/C

Location	TLD Rdg. - mrem
N. Perimeter Fence	26.3 ± 0.6
E. Perimeter Fence	20.3 ± 0.4
W. Perimeter Fence	29.5 ± 4.9
S. W. Perimeter Fence	22.3 ± 1.4
S. E. Perimeter Fence	25.6 ± 1.4
Visitors Center	19.6 ± 1.6
Rt. 104 Entrance	18.7 ± 1.1
N. W. of Site (6 Miles)	21.2 ± 0.4
N. W. of Site, Sacramento (22 Miles)	19.4 ± 2.3
S. W. of Site, Lodi (17 Miles)	23.8 ± 1.0
S. of Site (0.25 Miles)	19.2 ± 0.3
E. of Site, Ione (11 Miles)	19.0 ± 0.7
W. Milk Station (10 Miles)	17.5 ± 1.4
S. W. of Site, Galt (11 Miles)	16.5 ± 2.6
S. E. of Site, Camanche (11 Miles)	19.3 ± 0.5
W. of Site, Clay (1.5 Miles)	18.3 ± 1.4
S. W. Milk Station (9 Miles)	18.6 ± 1.0
N. E. of Site (8 Miles)	18.0 ± 1.0
S. E. of Site (1 Mile)	17.7 ± 0.4

* Detection Limit
** Below Detection Limit

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually

TYPE: G-Grab, C-Continuous, C'-Composite

TABLE 7

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

DOCKET NO. 50-312

FACILITY: RANCHO SECO UNIT 1 REPORTING PERIOD: 4TH QUARTER, 1980

AVERAGE QUARTERLY RESULTS

POST-TMI DIRECT RADIATION	mrem/Qtr.	Q/C
Location		TLD Rdg. (mrem)
WSW of Site (1.5 miles)		12.8± 0.3
SW of Site (1.7 miles)		14.2± 0.4
S of Site (1.8 miles)		14.1± 1.9
SSW of Site (1.8 miles)		13.4± 0.4
SSE of Site (1.8 miles)		12.4± 0.5
SW of Site (3.8 miles)		12.5± 0.8
SSW of Site (3.9 miles)		13.2± 1.2
S of Site (3.6 miles)		13.2± 1.0
SSE of Site (3.7 miles)		14.5± 1.4
S of Site (4.2 miles)		12.8± 0.3
WSW of Site (7.4 miles), front of Herald Fire Dept.		15.9± 0.9
W of Site (3.7 miles)		14.5± 1.4
WNW of Site (4.8 miles)		15.0± 1.2
WSW of Site (3.8 miles)		14.1± 1.2
NW of Site (3.8 miles)		14.1± 2.0
W of Site (1.9 miles)		14.8± 1.9
WNW of Site (1.6 miles)		11.7± 0.3
NW of Site (1.9 miles)		13.8± 1.6
NNW of Site (1.6 miles)		12.8± 0.6
NNE of Site (1.5 miles)		13.4± 2.5
N of Site (1.5 miles)		12.1± 1.5
NE of Site (2.0 miles)		16.2± 1.1
SE of Site (4.4 miles)		14.3± 1.5
SE of Site (1.6 miles)		11.9± 1.6
E of Site (1.4 miles)		13.1± 0.9
ESE of Site 1.4 miles)		11.5± 0.3
ENE of Site (1.3 miles)		14.5± 1.3
NE of Site (3 miles)		15.4± 1.4
ENE of Site (3.5 miles)		17.4± 0.6
E of Site (3.1 miles)		15.4± 1.2
ESE of Site (3.5 miles)		15.8± 1.7
E of Site Ione, Preston School of Industry (11 miles)		15.9± 2.2
E of Site Jackson, Civic Center (19 miles)		LOST
SE of Site Camanche Reservoir (11 miles)		16.3± 0.4
S of Site Clements (10 miles)		16.0± 2.1
WNW of Site Across from Dillard School (8.0 miles)		13.9± 1.2
NNW of Site (4.6 miles)		13.3± 0.7
N of Site (7.6 miles)		Future Location
NNE of Site (6.6 miles)		17.0± 1.5
NNW of Site Sloughouse P. O. (11.3 miles)		13.8± 2.4
N of Site Entrance to Rancho Murietta (10.6 miles)		13.8± 0.4
WNW of Site Elk Grove Cemetery (13 miles)		13.4± 1.3
SW of Site Galt (11 miles)		LOST

FREQUENCY: W-Weekly, F-Fortnightly, M-Monthly, Q-Quarterly, S-Semi-Annually
TYPE: G-Grab, C-Continuous, C'-Composite

RADIATION EXPOSURE, ENVIRONMENTAL PROTECTION EFFLUENT AND WASTE DISPOSAL

JANUARY - DECEMBER

1980 ANNUAL REPORT

FOR

SACRAMENTO MUNICIPAL UTILITY DISTRICT'S

RANCHO SECO UNIT 1

CLAY STATION, CALIFORNIA

LICENSE NUMBER DPR-54

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III. RADIOACTIVE EFFLUENT AND WASTE DISPOSAL

A. SUPPLEMENTAL INFORMATION

.1 Facility: Rancho Seco Unit #1

.2 Licensee: Sacramento Municipal Utility District

.3 Regulatory Limits

.a Noble Gases

Limit $\sum_{i \to n} Q_{iv} \left(62 \bar{E}_{i\gamma} + 110 \bar{E}_{i\beta}\right) \leq 1$

Qtrly Av. Limit $\sum_{i \to n} Q_{iv} \left(390 \bar{E}_{i\gamma} + 350 \bar{E}_{i\beta}\right) \leq 1$

12 Month Avg. Limit $\sum_{i \to n} Q_{iv} \left(780 \bar{E}_{i\gamma} + 700 \bar{E}_{i\beta}\right) \leq 1$

.b Iodines and Particulates with Half Lives > 8 days

Limit $1.7 \times 10^5 \, Qv \leq 1$

Qtrly Avg. Limit $2.14 \times 10^6 \, Qv \leq 1$

12 Month Avg. Limit $4.28 \times 10^6 \, Qv \leq 1$

.c Iodine - 131

Qtrly Limit 2 Ci

12 Month Limit 4 Ci

.d Liquid Effluents

Limits: Meet 10 CFR 20 App. B Table II Column 2

<10 Ci/reactor/Qtr
<20 Ci/reactor/12 months

.4 Maximum Permissible Concentrations

.a Fission and Activation Gases: Defined by 3a. above.
.b Iodines: Defined by 3b. above.
.c Particulates, half lives >8 days: Defined by 3b. above.
.d Liquid Effluents: Defined by 3d. above.

.5 Average Energy:

The following list of average gamma and beta energies per disintegration have been used to calculate isotopic release rate limitations for fission and activation gases.

AVERAGE ENERGY PER DISINTEGRATION

Isotope	$\bar{E}_\gamma$, mev/dis	$\bar{E}_\beta$, mev/dis
Kr-83m	0.00248	0.0371
Kr-85	0.0022	0.250
Kr-85m	0.159	0.253
Kr-87	0.793	1.32
Kr-88	1.95	0.377
Kr-89	2.22	1.37
Kr-90	2.10	1.01
Xe-131m	0.0201	0.143
Xe-133	0.0454	0.135
Xe-133m	0.042	0.19
Xe-135	0.247	0.317
Xe-135m	0.432	0.095
Xe-137	0.194	1.64
Xe-138	1.18	0.611

.6 Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases: Gamma spectrometry (GeLi) and liquid scintillation (for H-3).

b. Iodines: Gamma spectrometry (GeLi).

c. Particulates: Gamma spectrometry (GeLi) and beta proportional counting (for Sr-89 and 90) and alpha proportional counting (for gross alpha).

d. Liquid Effluents: Gamma spectrometry (GeLi) and liquid scintillation counting (for H-3) and beta proportional counting (for Sr-89 and 90 and gross beta) and alpha proportional counting (for gross alpha).

.7 Batch Releases

a. Liquid

.1 Number of batch releases: 5
.2 Total time period for batch releases: 47.8 hours
.3 Maximum time period for a batch release: 17.8 hours
.4 Average time period for a batch release: 9.6 hours
.5 Minimum time period for a batch release: 6.8 hours
.6 Average stream flow during period of release of effluent into a flowing stream: 3900 gpm

b. Gaseous

.1 Number of batch releases: 29
.2 Total time period for batch releases: 2359.9 hours
.3 Maximum time period for a batch release: 171.3 hours
.4 Average time period for a batch release: 81.4 hours
.5 Minimum time period for a batch release: 11.17 hours

.8 Abnormal Releases

a. Liquid

.1 Number of Releases: None
.2 Total activity released: None

b. Gaseous

.1 Number of releases: None
.2 Total activity released: None

B. GASEOUS EFFLUENTS

.1 A summary of all gaseous waste releases for 1980 is presented in Effluent and Waste Table 1A.

.2 Rancho Seco Unit 1 does not take credit for elevated releases of gaseous wastes, therefore Effluent and Waste Table 1B is not applicable.

.3 A summary of ground level releases of gaseous wastes during 1980 is presented in Effluent and Waste Table 1C. Note that this information is further subdivided into continuous releases (Table 1Ca) and batch mode released (Table 1Cb). Gaseous released radioactivity contained approximately 88% Xe-133; all noble gases accounted for 90% of total releases. Reactor Building purges contributed 4%, and continuous discharges from the Auxiliary Building contributed 95% of the total activity discharged.

C. LIQUID EFFLUENTS

There were 5 liquid radioactive waste released in 1980, as indicated in Tables 2A and 2B.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 1980

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	1ST QTR. SUMMARY	2ND QTR SUMMARY	3RD QTR SUMMARY	4TH QTR SUMMARY	1980 SUMMARY	EST. TOTAL % ERROR
A. FISSION & ACTIVATION GASES							
1. Total Release	Ci	2.22E+02	1.66E+01	2.05E+02	1.14E+03	1.58E+03	±3.09E00
2. Average Release Rate	µCi/sec	2.81E+01	2.1E00	2.60E+01	1.45E+02		
*3. % of Technical Specification Limit	%	8.58E-01	5.5E-02	6.80E-01	3.88E00		
B. IODINES							
1. Total I-131	Ci	6.35E-03	1.88E-05	2.27E-04	4.55E-04	7.05E-03	±4.45E00
2. Average Release Rate	µCi/sec	8.05E-04	2.38E-06	2.88E-05	5.76E-05		
*3. % of Technical Specification Limit	%	1.27E00	3.80E-03	4.54E-02	9.09E-02		
C. PARTICULATES							
1. Particulates (τ>8 days)	Ci	2.69E-03	2.15E-04	0.00E00	4.51E-06	2.91E-03	±6.32E00
2. Average Release Rate	µCi/sec	3.41E-04	2.79E-05	0.00E00	5.72E-07		
*3. % of Technical Specification Limit	%	2.92E-01	2.38E-02	0.00E00	5.0E-03		
4. Gross Alpha Radioactivity (3)	Ci	0.00E00	0.00E00	3.57E-08	2.62E-08	6.19E-08	2.175+01
D. TRITIUM							
1. Total Release	Ci	1.76E+01	2.88E+01	7.31E+01	5.79E+01	1.77E+02	2.01E00
2. Average Release Rate	µCi/sec	2.23E00	3.66E00	9.26E00	7.33E00		
*3. % of Technical Specification Limit	%	(1)	(1)	(1)	(1)		

*All percentages are based on NRC quarterly report limits as specified in Section 2.6.3.c(1) (2) and (3) of Rancho Seco Unit 1 Technical Specifications.

(1) All footnotes are given in Table 5.

TABLE 1B

EFFLUENT AND WASTE DISPOSAL REPORT

REPORTING PERIOD: 1980

GASEOUS EFFLUENTS - ELEVATED RELEASE

NOT APPLICABLE

TABLE 1C (a)

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT, 1980

GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES
CONTINUOUS MODE

	UNITS	1ST QTR SUMMARY	2ND QTR SUMMARY	3RD QTR SUMMARY	4TH QTR SUMMARY
1. FISSION GASES					
Krypton-85	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Krypton-85m	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Krypton-87	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Krypton-88	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Xenon-133	Ci	1.48E+02	1.64E+01	1.91E+02	1.13E+03
Xenon-135	Ci	1.67E+01	0.00E00(2)*	0.00E00(2)*	3.14E00
Xenon-135m	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Xenon-138	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Argon-41	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Unidentified	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Total for Period	Ci	1.65E+02	1.64E+01	1.91E+02	1.13E+03
2. IODINE					
Iodine-131	Ci	1.07E-03	6.07E-06	1.48E-04	4.54E-04
Iodine-133	Ci	1.4E-04	0.00E00(2)*	0.00E00(2)*	6.30E-04
Iodine-135	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Total for Period	Ci	1.21E-03	6.07E-06	1.48E-04	1.09E-03
3. PARTICULATES					
Strontium-89	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Strontium-90	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Cesium-134	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Cesium-137	Ci	3.86E-06	0.00E00	0.00E00	0.00E00
Barium-Lanthium -140	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Co-58, Co-60	Ci	2.14E-05 6.60E-06	5.97E-06 6.87E-06	0.00E00 0.00E00	0.00E00 4.51E-06
Unidentified	Ci	0.00E00	0.00E00	0.00E00	0.00E00

*Parenthesis numbers indicate the respective footnotes in Table 5 rather than exponentials.

TABLE 1C (b)

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT, 1980

GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES
BATCH MODE

	UNITS	1ST QTR SUMMARY	2ND QTR SUMMARY	3RD QTR SUMMARY	4TH QTR SUMMARY
1. FISSION GASES					
Krypton-85	Ci	1.37E00	1.58E-01	2.67E-01	1.98E00
Krypton-85m	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Krypton-87	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	1.90E-01
Krypton-88	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Xenon-133	Ci	5.47E+01	7.9E-04	1.44E+01	8.23E-02
Xenon-135	Ci	8.0E-02	0.00E00(2)*	0.00E00(2)*	4.21E-04
Xenon-135m	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Xenon-138	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Xenon-133m	Ci	3.5E-01	0.00E00(2)*	1.52E-01	0.00E00(2)*
Xenon-131m	Ci	6.2E-01	5.7E-03	1.73E-03	8.84E-02
Argon-41	Ci	0.0-E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Unidentified	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Total for Period	Ci	5.71E+01	1.64E-01	1.48E+01	2.15E00
2. IODINE					
Iodine-131	Ci	5.14E-03	1.27E-05	7.88E-05	0.00E00(2)*
Iodine-133	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Iodine-135	Ci	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*	0.00E00(2)*
Total for Period	Ci	5.14E-03	1.27E-05	7.89E-05	0.00E00
3. PARTICULATES					
Strontium-89	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Strontium-90	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Cesium-134	Ci	1.01E-04	8.04E-05	0.00E00	0.00E00
Cesium-137	Ci	1.87E-04	1.79E-05	0.00E00	0.00E00
Barium-Lanthium -140	Ci	0.00E00	0.00E00	0.00E00	0.00E00
Co-58	Ci	2.13E-03	8.52E-05	0.00E00	0.00E00
Co-60	ci	1.79E-04	1.84E-05	0.00E00	0.00E00
Mn54 and Nb95	Ci	7.94E-04	0.00E00	0.00E00	0.00E00
Unidentified	Ci	0.00E00	0.00E00	0.00E00	0.00E00

*Parenthesis numbers indicate the respective footnotes in Table 5 rather than exponentials.

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

REPORTING PERIOD: 1980

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	ANNUAL SUMMARY	EST. TOTAL ERROR, %
A. FISSION & ACTIVATION PRODUCTS			
1. Total Release (not including tritium, gases, alpha)	Ci	3.78E-03	±1.31E+01
2. Average diluted concentration during period	µCi/mℓ	1.28E-08	
3. Percent of applicable limit	%	7.2E00	
B. TRITIUM			
1. Total Release	Ci	1.47E-02	±1.27E+01
2. Average diluted concentration during period	µCi/mℓ	1.28E-08	
3. Percent of applicable limit	%	2.3E00	
C. DISSOLVED & ENTRAINED GASES			
1. Total Release	Ci	0.00E00	
2. Average diluted concentration during period	µCi/mℓ	0.00E00	
3. Percent of applicable limit	%	0.00E00	
D. GROSS ALPHA RADIOACTIVITY			
1. Total Release	Ci	0.00E00	
E. VOLUME OF WASTE RELEASED (prior to dilution)	liters	1.76E+06	±1.00E+01
F. VOLUME OF DILUTION WATER USED DURING PERIOD OF RADIOACTIVE LIQUID RELEASES	liters	2.58E+08	±1.00E+01

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

REPORTING PERIOD - 1980

LIQUID EFFLUENTS BATCH MODE

NUCLIDES RELEASED	UNIT	ANNUAL
Strontium-89	Ci	0.00E00
Strontium-90	Ci	0.00E00
Cesium-134	Ci	1.34E-03
Cesium-137	Ci	2.43E-03
Iodine-131	Ci	0.00E00
Cobalt-58	Ci	0E00
Cobalt-60	Ci	0E00
Iron-59	Ci	0.00E00
Zinc-65	Ci	0.00E00
Manganese-54	Ci	0.00E00
Chromium-51	Ci	0.00E00
Zirconium-Niobium-95	Ci	0.00E00
Molybdenum-99	Ci	0.00E00
Technetium-99m	Ci	0.00E00
Barium-Lanthanum-140	Ci	0.00E00
Cerium-141	Ci	0.00E00
Tritium (H3)	Ci	1.47E-02
Xenon-133	Ci	0.00E00
Xenon-135	Ci	0.00E00
Unidentified	Ci	0.00E00
Total for Period	Ci	1.85E-02

D. SOLID WASTE

There were 7 shipments of radioactive solid waste during 1980 to the Beatty, Nevada, burial site. Table 3A provides further details of the type and quantity of activity disposed. Three of the shipments made use of overpacks or shielded containers (42 drums). Most material was disposed in 55-gallon drums (500 drums), while there were 20 wooden boxes containing irregularly-shaped articles.

There were 23 shipments (51 containers) of solidified radioactive water during 1980 to the Richland, Washington burial site. Table 3A Part A1a and A2a provide further details of the type and quantity of activity disposed. The material was disposed in 195 cubic foot reinforced steel liners.

E. RADIOLOGICAL IMPACT ON MAN

Liquid Releases

Appendix I of 10 CFR 50 requires that the annual doses or dose committments to the total body or any organ of any individual from the sum of the exposure pathways from liquid effluents should not exceed 3 mrem and 10 mrem respectively.

Measured plant liquid effluent data was used to calculate estimates of doses to individuals and populations. Included in the source term were five (5) liquid batch releases. The total curies released are presented in Section C.

"Maximum Individual" and "Population" doses were calculated for a variety of liquid effluent exposure pathways representative of actual or potential usage conditions along the plant liquid effluent discharge course. These pathways include potable water, irrigated food (vegetation, milk and meat), fish and direct (recreational) exposures.

Whenever possible, calculations were based on existing data for the plant and its regional environmental characteristics. Where insufficient data existed to substantiate plant/site dependent assumptions, the parameters and models recommended in Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I", and 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I" and the LADTAP computer code were used.

The dose was computed for the individual who lives 1340 meters west northwest of the site near Clay Creek, fishes in the creek, and

TABLE 3

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT, 1980

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste	Unit	1980 Totals	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3 Ci	2.82E+02 5.28E+01	3.0E+01
b. Dry compressible waste, contaminated equipment, etc.	m^3 Ci	1.03E+02 2.68E+01	3.0E+01
c. Irradiated components, control rods, etc.	m^3 Ci	0.00E00 0.00E00	
d. Other (describe) Noncompressible waste	m^3 Ci	7.50E+01 3.25E+01	3.0E+01

2. Estimate of major nuclide composition (by type of waste)

a. H-3	%	6.5E+01
Cs-134	%	9.0E00
Cs-137	%	2.0E+01
Co-58	%	3.0E+00
Co-60	%	3.0E+00
b. Co-58	%	6.30E+01
Co-60	%	2.00E+01
Mn-54	%	1.60E+01
Cr-51 + Ag-110m	%	1.00E00
c. Not applicable		
d. Co-58	%	6.30E+01
Co-60	%	2.00E+01
Mn-54	%	1.60E+01
Cr-51 + Ag-110m	%	1.00E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
7	Truck (sole use)	Beatty, Nevada
23	Truck (sole use)	Richland, Washington

B. IRRADIATED FUEL SHIPMENTS (Disposition)

None

spends 100 hours per year swimming in an irrigation sump in the creek. In addition, it was assumed that undiluted water from Clay Creek (plant effluent water) was used to irrigate his vegetable garden and pasture land from which he received his milk, vegetables and meat. Studies conducted of the downstream water course show no indication of present or planned usage as a domestic water supply within five (5) miles downstream. Therefore, the drinking pathway was ignored in arriving at the total dose.

The maximum cumulative total body and organ doses to an exposed individual due to the radioactive liquid released was 0.112 and 0.153 (liver) millirem respectively. Greater than 98% of this hypothetical exposure comes from the consumption of fish. Table 6B shows all the organ doses.

All liquid release related total body and organ manrem doses for the population within 50 miles of the plant for the year 1980 are also provided on Table 6B. The total body and thyroid manrem were 7.78 E-02 and 5.01 E-02 respectively.

It can be seen that this controlled release of radioactive liquid resulted in dose values well below the guideline values of 10 CFR 50 Appendix I.

Gaseous Releases

Potential doses to individuals and populations were calculated using measured plant gaseous effluent and meteorological data. The following doses were calculated:

1. Total body and skin doses to individuals exposed at the point of maximum offsite ground-level concentrations of radioactive materials in gaseous effluents.

2. Organ doses to individuals in unrestricted areas from radioactive iodine and radioactive material in particulate form from all pathways of exposure.

3. Total body doses to the population and average dose to individuals in the population from gaseous effluents to a distance of 50 miles from the site.

Measured plant gaseous effluent data was used to calculate estimates of doses to individuals and populations. Included in the source term were thirteen (13) waste gas batch releases, sixteen (16) containment purges, and fifty three (53) weekly continuous plant releases. The total curies released are presented in Section B. Doses were computed for airborne noble gas, iodine, and particulate releases.

The dispersion of the airborne radioactive effluents was calculated on the basis of measured plant meteorological data consistent with the time period over which a given release was conducted. Measured meteorological data is presented and discussed in Section F. The dispersion model was based on the "straight-line airflow model" of NRC Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors", including appropriate corrections for terrain factor, plume depletion and deposition. All releases were assumed to be conducted at ground level from a single release point. (The meteorological model is discussed in detail in the "Appendix I Evaluation Report - Rancho Seco Nuclear Generating Station").

"Maximum Individual" and "Population" doses were calculated for a variety of gaseous effluent exposure pathways representative of actual or potential usage conditions within a five (5) mile radius of the plant. These pathways included plume, ground and inhalation exposures as well as meat, vegetable and milk consumption.

Whenever possible, calculations were based on existing data for the plant and its regional environmental characteristics. Where insufficient data existed to substantiate plant/site dependent assumptions, the parameters and models recommended in Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I", were used. Specific data and models for these calculations are presented in the "Appendix I Evaluation Report", as are the locations of the maximum exposed individuals.

Table 6A presents the calculated total body and organ doses to maximum exposed individuals due to measured plant gaseous effluent releases. The maximum calculated total body dose was 1.33 millirem to an individual residing 990 meters from the plant in the south sector. The maximum skin dose was 2.11 millirem to an individual residing 990 meters from the plant in the south sector. (All doses were calculated for the nearest existing residents in each sector within 5 miles of the plant.) Due to the relatively large magnitude of the noble gas source term in comparison to the airborne iodine and particulate source terms, the total body and organ doses were dominated by the plume pathway. Approximately 78% of each calculated dose resulted from continuous releases. Waste gas batch releases contributed a small fraction (1.6%) of the calculated total doses, while building purges contributed 20%.

It is apparent that the calculated total body and organ doses continue to be below the guideline values of 10 CFR 50, Appendix I.

The calculated total body dose for the (interpolated) 1980 population within 50 miles of the plant is 1.24 manrem. The total body dose to the average exposed individual within 50 miles of the plant is 5.11×10^{-4} millirem.

The calculated population doses are based on the ALARA procedure of the GASPAR dose factor code. This procedure assumes that the 50-mile population is eating the maximum amount of food produced within 50 miles of the plant and that no food is exported out of the 50-mile area.

These doses are based on straight line projections of the actual 1970 U. S. Census population data and the 1985 estimated population as given in the Rancho Seco Unit 1 FSAR.

F. METEOROLOGY

The meteorological data acquisition system for Rancho Seco consists of a permanent meteorological tower installed at the site, instrumentation and on-line computer. The main purpose of the system is to measure and compile the meteorological data necessary to define the atmospheric diffusion at the site. The system is designed to continue in operation indefinitely so that a broad statistical base for meteorological conditions at the site can be assembled.

The 200-foot meteorological tower is located on a hill approximately 3000 feet east of the Reactor Building. The location is unobstructed by trees, buildings, or topographical features. A Rohn SSV tower, open lattice construction, is used to support the instrumentation. The tower has sufficient rigidity so that measurement errors are not introduced by tower vibrations. Also the open lattice design of the tower does not significantly obstruct the air flow near the tower.

After the hourly and monthly tables for each month are compiled, the reduced data is added to a history tape which contains the hourly and monthly data from the months previously reduced. This tape is then used to compile seasonal and yearly tables and plots similar to those described in this report.

The hourly data for a period of six months was compiled into a joint frequency distribution of stability index, wind speed, and wind direction which is used for atmospheric dispersion at the Rancho Seco site.

The tower instrumentation consists of:

1. Wind speed measurements - 3 Weather Measure W103 anemometers (1 sensor at the 200' level and 2 sensors at the 33' level)

Starting threshold	.9 mph
Distance constant	14.3 ft
Accuracy	±1% or.15mph whichever is greater

2. Wind direction measurements - 3 Weather Measure W104 light weight vanes (1 sensor at the 200' level and 2 sensors at the 33' level)

Threshold	.75 mph

Damping ratio	.4
Distance constant	3.5 ft
Accuracy	.5% of full scale

3. Temperature measurements - 3 Litton Model ESL-310 with Climet Model 016-2 motor aspirated shield (temperature at 200', 33' and 6' levels)

Range	-20 C to 45 C
Accuracy	±0.25 C
Resolution	0.01 C
Time Constant	10 seconds

4. Temperature difference measurements 200' to 33' (3 measurements) one Litton Thermistor system described in 3 above and two Rosemount RTD systems with Model 442A temperature transmitter and Model 414L linear bridge mounted in Weather Measure Model 1S-6 motor aspirated temperature shields.

Range	-5 F to +5 F
Accuracy	± .1 F

5. Relative Humidity Measurement - Beckman Model 5412 (Sensor at the 6' level)

Range	10 to 100% r.h.
Accuracy	± 2% r.h.

Beginning in 1974 and continuing through 1980, data recovery has been in excess of 98%. The meteorlogical data is summarized in Table 4A, which shows the joint frequency distributions of wind direction and wind speed by atmospheric stability class for the four quarters of 1980. Table 4B provides this same information for those hours during each quarter in which batch gaseous releases were occurring.

EFFLUENT REPORT TABLE 4A

CONTINUOUS RELEASE METEOROLOGY SUMMARY

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	1	1
WSW	0	0	0	0	0	0	0
SW	0	1	0	0	0	0	1
SSW	1	2	0	0	1	0	4
S	2	2	1	0	0	0	5
SSE	6	3	0	0	0	0	9
SE	5	0	2	0	0	0	7
ESE	2	0	0	0	0	0	2
E	0	0	0	0	0	0	0
ENE	1	1	0	0	0	0	2
NE	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
TOTAL	19	9	3	0	1	1	33
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
W	0	0	0	0	0	1	1
WSW	0	0	0	0	0	0	0
SW	2	1	0	0	0	0	3
SSW	4	3	0	1	0	0	8
S	3	3	1	1	0	0	8
SSE	2	4	2	0	0	0	8
SE	0	1	0	0	0	0	1
ESE	1	3	0	0	0	0	4
E	3	0	0	0	0	0	3
ENE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	16	15	3	3	0	1	38
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	2	1	5	8
W	0	1	2	1	0	1	5
WSW	0	1	2	0	0	0	3
SW	3	1	0	0	0	0	4
SSW	2	1	0	2	0	0	5
S	3	0	2	1	0	0	6
SSE	4	2	1	0	0	0	7
SE	1	4	2	0	0	0	7
ESE	1	1	1	0	0	0	3
E	2	2	0	0	0	0	4
ENE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
TOTAL	17	14	10	6	1	6	54
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	4	0	2	0	0	0	6
NNW	4	4	0	0	0	0	8
NW	9	5	0	0	0	1	15
WNW	8	22	12	9	10	9	70
W	7	29	11	5	1	3	55
WSW	2	9	1	0	0	0	12
SW	6	7	8	2	0	0	23
SSW	4	10	8	6	0	0	28
S	6	4	2	2	1	0	15
SSE	5	16	6	5	2	1	35
SE	5	31	17	6	1	1	61
ESE	7	33	19	18	10	9	96
E	2	11	8	3	1	1	26
ENE	3	5	0	1	0	0	9
NE	5	2	0	0	0	0	7
NNE	4	1	0	0	0	0	5
TOTAL	91	188	96	57	26	25	471
CALM	4						

DELTA-T STD STABILITY INDEX E HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	11	8	1	0	0	0	20
NNW	5	8	3	0	0	0	16
NW	11	12	9	1	0	0	33
WNW	10	25	17	7	6	5	70
W	8	12	10	2	1	0	33
WSW	3	12	4	0	4	2	25
SW	11	7	0	1	1	0	20
SSW	9	4	4	9	0	0	26
S	11	10	9	2	1	4	37
SSE	9	13	11	3	2	3	41
SE	7	33	19	13	4	8	84
ESE	15	41	47	37	40	69	249
E	10	35	28	25	10	16	124
ENE	6	10	9	4	0	6	35
NE	8	6	1	0	0	0	15
NNE	11	2	0	0	0	0	13
TOTAL	145	238	172	104	69	113	841
CALM	6						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	8	12	0	0	0	0	20
NNW	13	6	0	1	0	0	20
NW	11	10	6	3	2	0	32
WNW	8	12	14	5	0	0	39
W	6	14	6	4	0	0	30
WSW	3	7	2	0	0	0	12
SW	1	8	0	0	0	1	10
SSW	3	0	0	0	0	6	9
S	3	6	1	0	0	8	18
SSE	1	7	2	0	0	5	15
SE	4	6	7	0	0	2	19
ESE	3	12	12	1	1	3	32
E	2	16	37	1	0	0	56
ENE	8	29	25	1	0	0	63
NE	10	12	1	0	0	0	23
NNE	11	8	2	0	0	0	21
TOTAL	95	165	115	16	3	25	419
CALM	6						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	11	32	0	0	0	0	43
NNW	9	8	0	0	0	0	17
NW	6	13	7	3	0	0	27
WNW	3	14	2	5	0	0	24
W	0	2	3	1	0	0	6
WSW	0	3	1	0	0	3	7
SW	1	0	1	0	0	2	4
SSW	3	1	0	0	0	7	11
S	0	0	0	0	0	5	5
SSE	1	4	1	0	0	6	12
SE	2	4	2	0	0	0	8
ESE	0	2	2	0	0	0	4
E	3	4	9	1	0	0	17
ENE	3	4	31	6	0	0	44
NE	12	16	2	0	0	0	28
NNE	17	31	0	0	0	0	48
TOTAL	69	136	61	16	0	23	305
CALM	3						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0
WNW	1	0	0	0	0	0	1
W	0	3	8	0	0	0	11
WSW	1	2	12	0	0	0	15
SW	3	44	38	2	0	0	87
SSW	3	50	47	13	0	0	113
S	5	29	37	17	2	0	90
SSE	2	19	15	5	0	0	41
SE	3	4	11	2	1	1	22
ESE	2	5	5	0	1	0	13
E	0	0	2	0	0	0	2
ENE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	22	156	175	39	4	1	397
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	1	0	0	0	0	1
WNW	0	1	0	0	0	0	1
W	0	1	3	1	0	0	5
WSW	0	3	4	0	0	0	7
SW	2	12	14	3	0	0	31
SSW	5	14	12	4	0	0	35
S	2	2	5	5	0	0	14
SSE	2	6	3	0	0	0	11
SE	0	7	4	1	0	0	12
ESE	3	2	2	0	0	0	7
E	1	1	0	0	0	0	2
ENE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	16	50	47	14	0	0	127
CALM	1						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	1	0	0	0	0	1
NNW	0	0	0	1	0	0	1
NW	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
W	1	0	6	4	0	0	11
WSW	1	1	3	1	0	0	6
SW	2	9	14	3	0	0	28
SSW	0	9	15	5	0	0	29
S	0	5	5	4	0	0	14
SSE	0	3	2	0	0	0	5
SE	0	9	2	0	0	0	11
ESE	0	3	2	0	0	0	5
E	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
NNE	2	0	0	0	0	0	2
TOTAL	9	40	49	19	0	0	117
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	1	0	0	0	0	0	1
NNW	2	0	0	0	0	0	2
NW	2	2	1	0	0	0	5
WNW	4	3	4	5	1	0	17
W	0	8	11	1	0	0	20
WSW	5	13	10	4	0	0	32
SW	10	15	26	6	0	0	57
SSW	5	14	34	13	2	0	68
S	4	9	16	9	0	0	38
SSE	4	13	8	0	1	0	26
SE	8	19	22	2	0	0	51
ESE	3	14	26	6	0	1	50
E	6	11	6	6	2	0	31
ENE	4	1	0	0	0	0	5
NE	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
TOTAL	58	123	164	52	6	1	404
CALM	3						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	11	4	0	0	0	0	15
NNW	8	7	0	0	0	0	15
NW	8	5	2	1	0	0	16
WNW	11	5	1	5	0	0	22
W	12	11	3	0	0	0	26
WSW	10	16	3	0	0	0	29
SW	20	62	27	6	0	0	115
SSW	20	45	41	6	0	0	112
S	21	45	13	3	0	0	82
SSE	15	45	8	0	0	0	68
SE	16	48	8	1	0	0	73
ESE	16	56	24	5	0	1	100
E	9	49	22	3	3	2	88
ENE	6	14	0	0	0	0	20
NE	10	3	0	0	0	0	13
NNE	9	7	0	0	0	0	16
TOTAL	202	420	152	30	3	3	810
CALM	23						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	8	5	0	0	0	0	13
NNW	5	5	0	0	0	0	10
NW	4	2	4	0	0	0	10
WNW	5	4	2	0	0	0	11
W	3	4	2	0	0	0	9
WSW	1	0	0	0	0	0	1
SW	2	5	3	0	0	0	10
SSW	10	18	5	0	0	0	33
S	5	5	6	0	0	0	16
SSE	1	4	2	0	0	0	7
SE	4	4	1	0	0	0	9
ESE	7	13	2	0	0	0	22
E	0	17	3	0	0	1	21
ENE	2	5	1	0	0	0	8
NE	1	1	0	0	0	0	2
NNE	4	5	1	0	0	0	10
TOTAL	62	97	30	0	0	1	190
CALM	4						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER CONTINUOUS METEOROLOGY
RELEASE NUMBER 1

WIND SPEED AT 33 FT (MILES/HOUR)

SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	3	9	0	0	0	0	12
NNW	3	5	0	0	0	0	3
NW	2	2	0	0	0	0	4
WNW	2	1	0	0	0	0	3
W	0	2	1	0	0	0	3
WSW	1	3	0	0	0	0	4
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	1	0	0	0	0	3	4
SSE	0	1	0	0	0	0	1
SE	1	3	0	0	0	0	4
ESE	1	1	1	0	0	0	3
E	1	2	1	0	0	0	4
ENE	1	2	7	0	0	0	10
NE	2	3	0	0	0	0	5
NNE	5	7	0	0	0	0	12
TOTAL	23	41	10	0	0	3	77
CALM	2						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	1	0	0	0	1
NW	0	1	3	1	0	0	5
WNW	0	6	2	0	0	0	8
W	0	10	5	0	0	0	5
WSW	0	14	13	0	0	0	2
SW	3	102	58	2	0	0	165
SSW	1	53	32	1	0	0	87
S	3	28	19	1	0	0	51
SSE	0	13	11	0	0	0	24
SE	0	5	1	0	0	0	6
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
NE	0	1	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	7	235	145	5	0	0	390
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	-
NW	0	2	2	1	0	0	5
WNW	0	5	0	0	0	0	5
W	1	10	2	0	0	0	13
WSW	1	5	9	0	0	0	15
SW	7	54	25	1	0	0	87
SSW	5	10	13	1	0	0	29
S	1	2	2	0	0	0	5
SSE	0	2	0	0	0	0	2
SE	2	1	1	0	0	0	4
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	2	0	0	0	0	2
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	17	94	54	3	0	0	168
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	1	0	0	0	0	1
WNW	0	3	1	0	0	0	4
W	0	3	0	0	0	0	3
WSW	1	4	2	0	0	0	7
SW	5	33	16	5	0	0	59
SSW	3	6	9	2	0	0	20
S	4	3	2	2	0	0	11
SSE	1	1	0	0	0	0	2
SE	0	3	0	0	0	0	3
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	14	57	30	9	0	0	110
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	2	1	0	0	0	0	3
NNW	3	2	1	1	0	0	7
NW	5	8	1	0	0	0	19
WNW	12	4	1	0	0	0	17
W	5	11	9	0	0	0	25
WSW	15	22	4	0	0	0	41
SW	12	44	113	11	0	0	180
SSW	11	23	40	3	0	0	77
S	6	9	15	0	0	0	30
SSE	5	5	3	0	0	0	13
SE	5	8	0	0	0	0	13
ESE	6	5	0	0	0	0	11
E	2	0	1	0	0	0	3
ENE	0	0	0	0	0	0	0
NE	1	1	0	0	0	0	2
NNE	0	0	0	0	0	0	0
TOTAL	90	144	188	15	0	0	437
CALM	2						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	11	2	0	0	0	0	13
NNW	29	8	0	0	0	0	37
NW	21	10	3	0	0	0	34
WNW	28	9	0	0	0	0	37
W	18	13	1	0	0	0	32
WSW	21	17	3	0	0	0	41
SW	12	37	10	0	0	0	59
SSW	24	46	31	0	0	0	101
S	23	39	6	0	0	0	68
SSE	23	38	4	0	0	0	65
SE	23	43	3	0	0	0	69
ESE	25	29	4	0	0	0	58
E	14	13	5	1	0	0	33
ENE	7	5	0	0	0	0	12
NE	3	2	0	0	0	0	5
NNE	6	1	0	0	0	0	7
TOTAL	288	312	70	1	0	0	671
CALM	10						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	11	14	0	0	0	0	25
NNW	20	9	0	0	0	0	29
NW	12	7	0	0	0	0	19
WNW	7	4	1	0	0	0	12
W	9	7	0	0	0	0	16
WSW	3	7	0	0	0	0	10
SW	7	15	2	0	0	0	24
SSW	6	20	3	0	0	0	29
S	7	9	1	0	0	0	16
SSE	9	17	2	0	0	0	28
SE	7	15	1	0	0	0	23
ESE	8	9	0	0	0	0	17
E	8	7	6	0	0	0	21
ENE	3	0	0	0	0	0	3
NE	6	2	0	0	0	0	8
NNE	5	1	0	0	0	0	6
TOTAL	128	142	16	0	0	0	286
CALM	2						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER ALL HOURS
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	5	0	0	0	0	5
NNW	0	7	0	0	0	0	7
NW	2	4	0	0	0	0	6
WNW	3	2	0	0	0	0	5
W	2	1	0	0	0	0	3
WSW	0	2	0	0	0	0	2
SW	1	1	1	0	0	0	3
SSW	0	3	0	0	0	0	3
S	0	0	0	0	0	2	2
SSE	3	2	1	0	0	0	6
SE	0	6	7	0	0	0	13
ESE	2	7	4	0	0	0	13
E	10	3	0	0	0	0	13
ENE	4	1	0	0	0	0	5
NE	1	2	0	0	0	0	3
NNE	1	1	0	0	0	0	2
TOTAL	29	47	13	0	0	2	91
CALM	2						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

WIND SPEED AT 33 FT (MILES/HOUR)

SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	3	1	0	2	2	3	11
NW	2	0	0	1	0	0	3
WNW	4	3	0	0	0	0	7
W	2	19	2	0	0	0	23
WSW	10	6	2	0	0	0	18
SW	6	4	0	0	0	0	10
SSW	11	9	0	0	1	0	21
S	10	5	0	0	0	1	16
SSE	4	3	2	0	0	0	9
SE	5	7	0	0	0	0	12
ESE	0	3	0	0	0	0	3
E	2	0	0	0	0	0	2
ENE	1	0	0	0	0	0	1
NE	3	0	0	0	0	0	3
NNE	2	0	0	0	0	0	2
TOTAL	65	60	6	3	3	4	141
CALM	5						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

WIND SPEED AT 33 FT (MILES/HOUR)

SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	2	0	4	1	0	1	8
NW	4	5	3	0	0	0	12
WNW	5	8	0	0	0	0	13
W	4	23	1	0	0	0	28
WSW	2	1	1	0	0	0	4
SW	1	0	0	0	0	0	1
SSW	4	2	0	0	0	0	6
S	2	5	2	0	0	0	9
SSE	5	3	1	1	0	0	10
SE	0	2	0	0	0	0	2
ESE	2	0	0	0	0	0	2
E	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
NE	3	0	0	0	0	0	3
NNE	4	1	0	0	0	0	5
TOTAL	39	50	12	2	0	1	104
CALM	3						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

WIND SPEED AT 33 FT (MILES/HOUR)

SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	2	1	0	0	1	0	4
NNW	2	4	2	3	2	1	14
NW	5	7	5	0	0	0	17
WNW	1	5	1	0	0	0	7
W	3	20	4	0	0	0	27
WSW	3	1	0	0	0	0	4
SW	2	3	0	0	0	0	5
SSW	1	3	1	0	0	0	5
S	5	4	4	1	1	0	15
SSE	1	4	1	1	0	1	8
SE	0	2	0	0	0	0	2
ESE	1	0	0	0	0	0	1
E	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
TOTAL	28	54	18	5	4	2	111
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

WIND SPEED AT 33 FT (MILES/HOUR)

SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	7	11	0	0	1	1	20
NNW	8	20	7	1	5	1	42
NW	10	37	16	2	1	0	66
WNW	11	19	2	0	0	2	34
W	11	41	10	1	0	0	63
WSW	9	10	5	0	0	0	24
SW	4	12	3	0	0	0	19
SSW	5	8	3	1	0	0	17
S	10	14	3	0	0	1	27
SSE	8	15	8	5	1	1	38
SE	4	10	3	0	0	0	17
ESE	3	3	1	0	1	0	8
E	3	2	0	0	0	0	5
ENE	1	1	0	0	0	0	2
NE	3	1	0	0	0	1	5
NNE	4	2	0	0	0	0	6
TOTAL	101	205	61	10	9	7	393
CALM	7						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	7	3	0	0	1	0	11
NNW	8	7	4	10	1	0	30
NW	9	15	5	0	1	1	31
WNW	6	9	1	0	0	0	16
W	15	12	2	0	0	0	29
WSW	17	19	4	2	1	1	44
SW	8	18	0	2	0	0	28
SSW	7	10	0	0	1	0	18
S	14	24	0	1	1	1	41
SSE	12	15	3	9	4	14	57
SE	19	24	4	6	5	1	59
ESE	10	9	2	0	0	0	21
E	10	4	0	0	0	1	15
ENE	4	1	0	0	0	0	5
NE	5	5	0	0	0	1	11
NNE	11	2	1	1	0	0	15
TOTAL	162	177	26	31	15	20	431
CALM	14						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	12	6	4	0	0	0	22
NNW	10	13	7	1	1	0	32
NW	5	6	3	0	0	0	14
WNW	6	5	1	0	0	0	12
W	9	6	0	0	0	0	15
WSW	10	7	0	0	0	1	18
SW	7	5	2	0	0	0	14
SSW	3	5	0	0	0	2	10
S	10	4	1	0	0	0	15
SSE	12	20	5	0	0	0	37
SE	11	37	11	1	0	1	61
ESE	15	24	3	0	0	0	46
E	10	7	1	0	0	0	18
ENE	29	11	1	0	0	0	41
NE	18	7	1	0	0	0	26
NNE	17	6	3	0	0	0	26
TOTAL	194	171	45	2	1	4	407
CALM	14						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-ALL HOURS
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	18	12	0	0	0	0	30
NNW	6	6	1	0	0	0	13
NW	0	2	1	0	0	0	3
WNW	1	1	0	0	0	0	2
W	5	1	1	0	0	0	7
WSW	3	3	0	0	0	0	6
SW	2	2	0	0	0	0	4
SSW	6	1	0	0	0	1	8
S	12	12	0	0	0	0	24
SSE	7	21	4	0	0	0	32
SE	25	19	8	0	0	1	53
ESE	21	59	21	0	0	0	101
E	38	41	4	0	0	0	83
ENE	57	49	5	0	0	0	111
NE	25	26	3	0	0	0	54
NNE	21	5	2	0	0	0	28
TOTAL	247	260	50	0	0	2	559
CALM	16						

EFFLUENT REPORT TABLE 4B

BATCH RELEASE METEOROLOGY SUMMARY

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	0	1	0	0	0	0	1
SSW	0	0	0	0	0	0	0
S	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
SE	2	0	2	0	0	0	4
ESE	2	0	0	0	0	0	2
E	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
TOTAL	7	3	2	0	0	0	12
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	1	1	0	0	0	0	2
SSW	3	1	0	0	0	0	4
S	1	3	0	1	0	0	5
SSE	2	3	1	0	0	0	6
SE	0	0	0	0	0	0	0
ESE	1	2	0	0	0	0	3
E	3	0	0	0	0	0	3
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	11	10	1	2	0	0	24
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	1	0	0	0	0	1
WSW	0	0	0	0	0	0	0
SW	1	1	0	0	0	0	2
SSW	2	1	0	1	0	0	4
S	2	0	1	1	0	0	4
SSE	0	1	0	0	0	0	1
SE	0	2	1	0	0	0	3
ESE	1	1	1	0	0	0	3
E	2	2	0	0	0	0	4
ENE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
TOTAL	9	10	3	2	0	0	24
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	2	0	2	0	0	0	4
NNW	3	3	0	0	0	0	6
NW	6	1	0	0	0	1	8
WNW	8	9	4	4	3	5	33
W	4	17	4	0	0	0	25
WSW	1	3	0	0	0	0	9
SW	5	6	0	2	0	0	13
SSW	2	4	6	2	0	0	14
S	5	1	1	1	1	0	9
SSE	5	11	4	5	2	1	28
SE	2	21	9	5	1	1	39
ESE	3	23	12	13	6	9	66
E	1	7	5	2	1	1	17
ENE	0	4	0	1	0	0	5
NE	3	1	0	0	0	0	4
NNE	2	0	0	0	0	0	2
TOTAL	52	116	47	35	14	18	282
CALM	3						

DELTA-T STD STABILITY INDEX E HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	8	7	0	0	0	0	15
NNW	5	5	0	0	0	0	10
NW	6	7	7	1	0	0	21
WNW	7	17	13	4	4	1	46
W	6	7	5	0	0	0	18
WSW	2	9	0	0	4	2	17
SW	7	4	0	0	1	0	12
SSW	5	3	1	3	0	0	12
S	3	4	6	1	1	4	19
SSE	4	7	5	1	0	3	20
SE	6	16	10	6	3	5	46
ESE	10	27	29	20	24	53	163
E	7	17	20	13	10	16	83
ENE	4	8	3	4	0	6	25
NE	6	3	0	0	0	0	9
NNE	6	1	0	0	0	0	7
TOTAL	92	142	99	53	47	90	523
CALM	5						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	3	5	0	0	0	0	8
NNW	7	3	0	0	0	0	10
NW	8	3	3	3	0	0	17
WNW	4	6	5	2	0	0	17
W	4	6	1	2	0	0	13
WSW	2	4	0	0	0	0	6
SW	0	3	0	0	0	1	4
SSW	1	0	0	0	0	6	7
S	0	2	1	0	0	8	11
SSE	1	1	0	0	0	5	7
SE	2	4	2	0	0	2	10
ESE	2	6	4	1	0	0	13
E	1	9	21	1	0	0	32
ENE	6	19	16	1	0	0	42
NE	9	9	0	0	0	0	18
NNE	10	6	0	0	0	0	16
TOTAL	60	86	53	10	0	22	231
CALM	4						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

FIRST QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	7	19	0	0	0	0	26
NNW	6	3	0	0	0	0	9
NW	3	6	0	1	0	0	10
WNW	0	5	1	0	0	0	6
W	0	1	0	0	0	0	1
WSW	0	0	0	0	0	3	3
SW	0	0	0	0	0	2	2
SSW	3	0	0	0	0	7	10
S	0	0	0	0	0	5	5
SSE	1	3	0	0	0	6	10
SE	2	3	0	0	0	0	5
ESE	0	1	0	0	0	0	1
E	2	3	2	1	0	0	8
ENE	3	2	15	1	0	0	21
NE	9	12	1	0	0	0	22
NNE	12	27	0	0	0	0	39
TOTAL	48	85	19	3	0	23	178
CALM	3						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	1	3	2	0	0	0	6
SSW	0	4	5	4	0	0	13
S	0	6	3	1	0	0	10
SSE	0	3	0	0	0	0	3
SE	0	0	1	0	0	0	1
ESE	0	1	0	0	0	0	1
E	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	2	17	12	5	0	0	36
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METEOROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	1	0	1	0	0	0	2
SSW	0	2	1	1	0	0	4
S	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
ESE	1	0	0	0	0	0	1
E	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	2	4	3	1	0	0	10
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METECROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	0	1	1	0	0	0	2
SSW	0	0	1	1	0	0	2
S	0	1	2	0	0	0	3
SSE	0	1	0	0	0	0	1
SE	0	3	0	0	0	0	3
ESE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	0	7	4	1	0	0	12
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METECROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3		8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	1	0	0	0	0	0	1
W	0	0		0	0	0	0
WSW	1	2		0	0	0	3
SW	0	1	2	0	0	0	3
SSW	1	0	6	4	2	0	13
S	1	2	4		0	0	8
SSE	0	2	1	0	1	0	4
SE	0	1	1	2	0	0	4
ESE	0	1	7	1	0	0	9
E	0	3	0	2	0	0	5
ENE	1	1	0	0	0	0	2
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	5	13	21	10	3	0	52
CALM	0						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METECROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	1	3	0	0	0	0	4
NNW	1	2	0	0	0	0	3
NW	1	2	0	0	0	0	3
WNW	2	3	0	0	0	0	5
W	3	1	0	0	0	0	4
WSW	2	4	1	0	0	0	7
SW	7	25	12	1	0	0	45
SSW	5	10	11	2	0	0	28
S	7	12	4	0	0	0	23
SSE	5	19	3	0	0	0	27
SE	4	16	0		0	0	20
ESE	2	12	8		0	0	22
E	2	7	9		0	0	18
ENE	0	6	0	0	0	0	6
NE	2	0	0	0	0	0	2
NNE	3	1	0	0	0	0	4
TOTAL	47	123	48	3	0	0	221
CALM	11						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METECROLOGY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	1	0	0	0	0	0	1
WSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
SSW	1	3	0	0	0	0	4
S	0	0	0	0	0	0	0
SSE	0	2	0	0	0	0	2
SE	0	0	0	0	0	0	0
ESE	2	2	2	0	0	0	6
E	0	5	2	0	0	0	7
ENE	0	2	0	0	0	0	2
NE	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
TOTAL	5	14	4	0	0	0	23
CALM	0						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

SECOND QUARTER BATCH ONLY METECROLOGY
RELEASE NUMBER 1

SECTOR	WIND SPEED AT 33 FT (MILES/HOUR) 1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	0	1	0	0	0	0	1
CALM	0						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	1	0	0	0	1
SW	1	13	8	0	0	0	22
SSW	0	11	3	0	0	0	14
S	0	4	1	0	0	0	5
SSE	0	1	2	0	0	0	3
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	1	29	15	0	0	0	45
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	2	0	0	0	2
SW	2	18	5	0	0	0	25
SSW	1	2	0	0	0	0	3
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	4	20	7	0	0	0	31
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	2	0	0	0	0	2
SW	0	7	2	0	0	0	9
SSW	1	3	1	0	0	0	5
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	1	12	3	0	0	0	16
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	0	0	0	0	1
NW	1	1	0	0	0	0	2
WNW	1	0	0	0	0	0	1
W	0	0	0	0	0	0	0
WSW	4	6	0	0	0	0	10
SW	2	13	19	3	0	0	37
SSW	0	1	7	0	0	0	8
S	2	2	1	0	0	0	5
SSE	2	0	1	0	0	0	3
SE	0	0	0	0	0	0	0
ESE	1	1	0	0	0	0	2
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	14	24	28	3	0	0	69
CALM	0						

DELTA-T STD STABILITY INDEX E HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	2	0	0	0	0	0	2
NNW	6	1	0	0	0	0	7
NW	4	3	0	0	0	0	7
WNW	9	3	0	0	0	0	12
W	2	2	0	0	0	0	4
WSW	5	2	0	0	0	0	7
SW	4	10	1	0	0	0	15
SSW	8	8	6	0	0	0	22
S	4	2	2	0	0	0	8
SSE	3	1	0	0	0	0	4
SE	5	11	1	0	0	0	17
ESE	3	4	0	0	0	0	7
E	1	2	2	0	0	0	5
ENE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
NNE	1	1	0	0	0	0	2
TOTAL	58	50	12	0	0	0	120
CALM	2						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	2	4	0	0	0	0	6
NNW	2	3	0	0	0	0	5
NW	5	1	0	0	0	0	6
WNW	1	1	0	0	0	0	2
W	1	0	0	0	0	0	1
WSW	1	0	0	0	0	0	1
SW	0	1	1	0	0	0	2
SSW	0	4	0	0	0	0	4
S	1	0	0	0	0	0	1
SSE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
TOTAL	15	14	1	0	0	0	30
CALM	0						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

THIRD QUARTER BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	1	0	0	0	0	1
NNW	0	4	0	0	0	0	4
NW	0	1	0	0	0	0	1
WNW	0	0	0	0	0	0	0
W	1	0	0	0	0	0	1
WSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	1	6	0	0	0	0	7
CALM	0						

DELTA-T STD STABILITY INDEX A HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
SSW	1	0	0	0	0	0	1
S	1	0	0	0	0	0	1
SSE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
TOTAL	4	0	0	0	0	0	4
CALM	0						

DELTA-T STD STABILITY INDEX B HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	0	0	1	0	0	0	1
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	2	1	0	0	0	3
WSW	1	1	0	0	0	0	2
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	1	3	2	0	0	0	6
CALM	0						

DELTA-T STD STABILITY INDEX C HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	1	0	0	0	0	0	1
NNW	0	1	1	0	0	0	2
NW	0	1	0	0	0	0	1
WNW	0	1	0	0	0	0	1
W	0	2	1	0	0	0	3
WSW	0	1	0	0	0	0	1
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	1	6	2	0	0	0	9
CALM	0						

DELTA-T STD STABILITY INDEX D HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	0	0	0	0	0	0	0
NNW	1	0	1	0	0	0	2
NW	1	0	2	0	0	0	3
WNW	0	2	0	0	0	0	2
W	0	4	2	0	0	0	6
WSW	0	1	2	0	0	0	3
SW	0	2	1	0	0	0	3
SSW	0	2	1	0	0	0	3
S	1	1	0	0	0	0	2
SSE	0	2	0	0	0	0	2
SE	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	1	1	0	0	0	0	2
NNE	0	0	0	0	0	0	0
TOTAL	4	18	9	0	0	0	29
CALM	0						

DELTA-T STD STABILITY INDEX E HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	1	0	0	0	0	0	1
NNW	0	0	0	0	0	0	0
NW	0	1	2	0	0	1	4
WNW	0	0	0	0	0	0	0
W	4	0	0	0	0	0	4
WSW	1	0	1	0	0	0	2
SW	1	3	0	0	0	0	4
SSW	0	0	0	0	0	0	0
S	1	6	0	0	0	0	7
SSE	3	4	0	0	0	0	7
SE	3	3	0	0	0	0	6
ESE	0	3	0	0	0	0	3
E	1	0	0	0	0	0	1
ENE	2	0	0	0	0	0	2
NE	1	0	0	0	0	0	1
NNE	1	1	0	0	0	0	2
TOTAL	19	21	3	0	0	1	44
CALM	3						

DELTA-T STD STABILITY INDEX F HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	3	0	0	0	0	0	3
NNW	2	0	0	0	0	0	2
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	0	0	0	0	1	1
SW	2	1	1	0	0	0	4
SSW	1	1	0	0	0	0	2
S	1	2	0	0	0	0	3
SSE	0	3	0	0	0	0	3
SE	2	4	0	0	0	0	6
ESE	0	2	0	0	0	0	2
E	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
NE	1	1	0	0	0	0	2
NNE	1	0	0	0	0	0	1
TOTAL	13	14	1	0	0	1	29
CALM	1						

DELTA-T STD STABILITY INDEX G HOURS AT EACH WIND SPEED AND DIRECTION

1980 FOURTH QUARTER-BATCH RELEASE HOURS ONLY
RELEASE NUMBER 1

	WIND SPEED AT 33 FT (MILES/HOUR)						
SECTOR	1-3	4-7	8-12	13-18	19-24	24+	TOTAL
N	1	0	0	0	0	0	1
NNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WSW	0	2	0	0	0	0	2
SW	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ENE	1	1	0	0	0	0	2
NE	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
TOTAL	4	3	0	0	0	0	7
CALM	1						

EFFLUENT REPORT TABLE 4C

ABNORMAL RELEASE METEOROLOGY SUMMARY

NOT APPLICABLE

TABLE 5

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

REPORTING PERIOD: 1980

NOTES

(1) No Technical Specification limit for release of Tritium in gaseous effluents.

(2) No measurable activity in samples collected during this period. Measurement sensitivity and volumes of air released during the reporting period are as follows:

ISOTOPE	MINIMUM DETECTABLE ACTIVITY (μCi/mℓ)	BATCH RELEASE VOLUME (cc)	CONTINUOUS RELEASE VOLUME (cc)
Kr-85	6.42E-06		
Kr-85m	2.23E-08	Gaseous 4.54E13	3.55E14
Kr-87	4.80E-08		
Kr-88	5.93E-08		
Xe-135	3.27E-08		
Xe-135m	4.85E-08		
Xe-138	1.76E-07		
Xe-133	9.59E-08		
Xe-133m	1.26E-07		
Xe-131m	8.53E-07		
Ar-41	2.96E-08		
I-131	2.31E-13		
I-133	2.31E-12		
I-135(4)	1.71E-11		
H-3	3.89E-10		

(3) Particulate gross alpha due to naturally occurring Radon daughters.

(4) Based on a 24-hour sample

TABLE 6A

1980 ANNUAL TOTAL BODY AND ORGAN DOSES TO
MAXIMUM EXPOSED INDIVIDUALS (BY SECTOR) DUE TO GASEOUS EFFLUENT RELEASES(1),(2),(3),(4)

Sector(5),(6) (Distance,Meters)	Total Body	GI Tract	Bone	Liver	Kidney	Thyroid	Lung	Skin
NE (1770)	2.10E-01	2.09E-01	6.59E-02	2.11E-01	2.10E-01	3.38E-01	2.12E-01	3.25E-01
ENE (1220)	3.64E-01	3.63E-01	1.11E-01	3.65E-01	3.64E-01	5.78E-02	3.67E-01	5.59E-01
ESE (4820)	1.72E-02	1.70E-02	4.29E-03	1.73E-02	1.72E-02	3.46E-02	1.72E-02	2.42E-02
SE (6550)	8.90E-03	8.84E-03	2.76E-03	8.94E-03	8.88E-03	1.67E-02	8.96E-03	1.36E-02
SSE (5490)	1.71E-02	1.71E-02	5.02E-03	1.71E-02	1.71E-02	2.29E-02	1.73E-02	2.60E-02
S (990)	1.33E 00	1.33E 00	4.51E-01	1.33E 00	1.33E 00	2.08E 00	1.34E 00	2.11E 00
SSW (1150)	1.05E 00	1.04E 00	4.06E-01	1.06E 00	1.05E 00	2.27E 00	1.06E 00	1.72E 00
SW (2130)	1.54E-01	1.52E-01	6.40E-02	1.55E-01	1.53E-01	3.07E-01	1.55E-01	2.61E-01
WSW (1980)	2.89E-01	2.87E-01	1.27E-01	2.91E-01	2.88E-01	5.09E-01	2.93E-01	5.05E-01
W (3050)	7.89E-02	7.76E-02	3.00E-02	7.96E-02	7.82E-02	1.88E-01	7.85E-02	1.26E-01
WNW (1340)	7.46E-01	7.32E-01	2.57E-01	7.54E-01	7.40E-01	1.95E 00	7.41E-01	1.14E 00
NW (6070)	2.46E-02	2.44E-02	9.09E-03	2.47E-02	2.45E-02	4.02E-02	2.48E-02	4.02E-02
NNW (6710)	1.69E-02	1.68E-02	4.95E-03	1.70E-02	1.68E-02	2.67E-02	1.70E-02	2.54E-02
VC (310)	1.67E 00	1.67E 00	6.56E-01	1.67E 00	1.67E 00	2.17E 00	1.70E 00	2.84E 00
REC (2330)	2.75E-02	2.73E-02	7.11E-03	2.76E-02	2.74E-02	4.89E-02	2.77E-02	3.94E-02

AVERAGE PERCENT OF TOTAL FOR CONTINUOUS RELEASE = 78.020966
AVERAGE PERCENT OF TOTAL FOR PURGES = 20.309204
AVERAGE PERCENT OF TOTAL FOR WASTE GAS RELEASES = 1.669670

NOTES:
(1) All doses calculated in millirem.
(2) Includes waste gas, containment purge and continuous releases for calendar year 1980.
(3) Total body and organ doses are similar due to dominance of noble gas source term.
(4) Source terms include noble gases, iodines and airborne particulates.
(5) Distance to nearest residence within 5 miles; (-) indicates no residence within 5 miles.
(6) Doses are calculated for areas accessible to the public and time weighted:
Visitors Center - Open daily; maximum exposed invididual is SMUD attendant at 1470 hours/year.
Recreation Area - Open daily; maximum exposed individual is Park Ranger at 2628 hours/year.

TABLE 6B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

REPORTING PERIOD: 1ST AND 2ND QUARTERS, 1980

TOTAL BODY AND ORGAN DOSES TO MAXIMUM EXPOSED INDIVIDUALS DUE TO LIQUID EFFLUENT RELEASES (MILLIREM)

TOTAL BODY	G.I. TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
1.12E-01	3.13E-03	9.25E-02	1.53E-01	5.17E-02	2.78E-04	1.73E-02	9.54E-05

ALARA TOTAL BODY AND ORGAN DOSES TO POPULATION DUE TO LIQUID EFFLUENT RELEASES (MANREM)

TOTAL BODY	G.I. TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
7.78E-02	6.91E-02	9.60E-01	1.46E-00	4.13E-01	5.01E-02	2.11E-01	6.49E-04