

EXXON NUCLEAR COMPANY, Inc.

2101 Horn Rapids Road

P. O. Box 130, Richland, Washington 99352

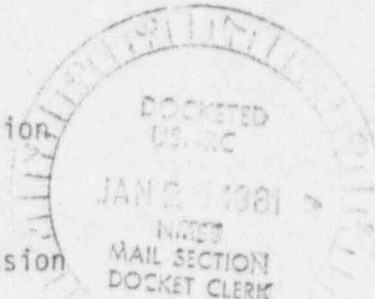
Phone: (509) 375-8100 Telex: 15-2878

LPOR

70-1257

January 9, 1981

E. Y. Shum  
Uranium Process Licensing Section  
Uranium Fuel Licensing Branch  
Division of Fuel Cycle and  
Material Safety  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555



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MAIL SECTION

Gentlemen:

Reference: Your letter of October 8, 1980.

Enclosed are two copies of Exxon Nuclear's responses to comments and questions of sections 1, 2 and 3 of the enclosure to your October 8, 1980 letter. Our responses to comments and questions of sections 4, 5, 6 and 7 will be transmitted in the near future.

This partial response is being transmitted to allow your evaluation of our environmental information to continue in a timely manner.

If you have any questions or comments, please call me on (509) 375-8537.

Sincerely,

H. Paul Estey, Manager  
Licensing & Compliance,  
Operating Facilities

HPE/clc

cc: Dr. F. Wimpey  
1710 Goodridge Drive  
P.O. Box 1303  
McLean, VA 22102  
(with 3 copies of  
the Enclosure)

FEE EXEMPT

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## Enclosure

### Responses to Questions

Related to Environmental Information  
Submitted in Connection with Exxon Nuclear's License  
Renewal Application (SNM-1227, Docket No. 70-1257)

#### 1. General

##### 1.1 Comment

*What is the current census and population distribution within a 50-mile radius of the site?*

##### Response

The 1980 census information is not yet available. However, data presented in Table II-1.2-3 of Exxon Nuclear's "License Application for Special Nuclear Material: Experimental Test Facility", August 1979, Document No. XN-EL-29, Rev. 2 (which were used by the Staff in their analysis of the effects of natural phenomena relative to our plutonium fabrication plant<sup>(1)</sup>) have been appropriately updated with data contained in a recent WPPSS document, "Projections and Distributions of Populations in 50-Mile Radius of Tri-City Area by Compass Direction and Radii Intervals 1970-2030", January 1980. A copy of the WPPSS report has already been provided to the NRC. The updated data are given in Table 1.1 (attached).

##### 1.2 Comment

*What are the projected population growths in the next 5- and 10-year periods?*

##### Response

The projected population distribution data for 1990 previously furnished in Table II-1.2-4 of XN-EL-29, Rev. 2 (previously cited), have been appropriately updated with data contained in the previously cited WPPSS report, and are provided in Table 1.2-2 (attached).

An estimate of the projected 1985 population distribution data was obtained by comparing Tables 1.1 and 1.2-2 and applying expected modifying factors. The projected 1985 population distribution data are presented in Table 1.2-1 (attached).

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(1) Letter from L.C. Rouse to R. Nilson, dated March 13, 1980.

1.3 Comment

*What is the current land use pattern of the area within a 50-mile radius of the site?*

Response

The current land use pattern of the area within a 50-mile radius of the Exxon Nuclear site is shown in Figures 1.3-1 through 1.3-3.

1.4 Comment

*Is the land use pattern expected to change in the next 5- and 10-year periods?*

Response

Significant changes occurred in the uses of adjacent lands in the last 5 years as a result of increased construction activity on the Hanford Reservation, new industrial development in the Tri-Cities, and expansion in irrigated agriculture near the Tri-Cities.

Most major new irrigation developments occurred south of the Tri-Cities area in the Hermiston-Boardman area in Oregon and in the Plymouth area in Washington. Other new developments were in the hills adjacent to the Snake River east of Pasco, along the Yakima River west and north of West Richland, and in the hills northwest of the Hanford Reservation.

Significant new irrigation development is expected soon in the Horse Heaven Hills southwest of the Tri-Cities (about 300,000 acres) and in the Columbia Basin Project north and east of the Columbia River (about 470,000 acres).

1.5 Comment

*What is the location of the nearest residence:*

- a. *to the site boundary?*
- b. *to an exhaust stack?*
- c. *downwind of an exhaust stack based on the prevailing winds?*

Response

- a. 1.8 miles to the southeast (141° east from north).
- b. 2.4 miles to the southeast (140° east from north).
- c. The distances to the nearest residence in each of the three major downwind directions are provided below:

<u>Direction from stack</u>	<u>% of time wind in this direction</u>	<u>Dist. to Resid.</u>
NE	20.3	3 Miles
NW	16.7	30 Miles
SE	16.4	2.4 Miles

1.6 Comment

*What is the most recent compilation of effluent history?*

Response

The amounts of radioactive materials discharged in gaseous and liquid effluent streams since 1975 are tabulated below:

<u>Year</u>	<u>μCi</u>			
	<u>Uranium to Atmosphere</u>	<u>Uranium to Sewer</u>	<u>Plutonium to Atmosphere</u>	<u>Plutonium to Sewer</u>
1976	11.2	5370 <sup>(a)</sup>	0.37	0.17
1977	14.6	2660 <sup>(a)</sup>	0.21	-0-
1978	125.2	2740 <sup>(a)</sup>	<0.15	-0-
1979	39.6	3820 <sup>(a)</sup>	0.05	-0-
1980 <sup>(c)</sup>	26.2	-0- <sup>(b)</sup>	0.02	-0-

(a) These values have been rounded from values reported to the NRC per 10 CFR 70.59. Furthermore, the values are based on some "less than 0.1 ppm" values.

(b) Starting in 1980, only positive values are used.

(c) First 3 quarters, only.

1.7 Comment

*Has the area's wildlife status changed in the last 5 years or is it expected to change in the next 5 years?*

Response

No, to both parts of this question.

1.8 Comment

*Are there any endangered species which live in or migrate through the area?*

Response

The bald eagle (Haliaeetus leucocephalus) is the only threatened specie (Federal designation) to occur routinely in the area. The population on the Hanford DOE Site has increased over the years from five (5) birds in the 1960's to over 15 birds in the late 1970's. Eagles generally arrive during mid-November, with a peak abundance occurring in late November through early February, and begin to depart in mid-February. They do not nest in the area. The American peregrine falcon (Falcon peregrinus anatum) is an endangered specie (Federal designation) which may at times appear along the corridors, although the exact ranges are not known.

1.9 Comment

*Have local meteorological conditions and radiation and radioactivity levels in background been affected by the volcanic activity of Mt. St. Helens?*

Response

No lasting measurable impact has been either determined or detected. However, there has been speculation that "seeding" of clouds by ash from the eruptions has caused some increased local rains.

1.10 Comment

*What is the site safety record regarding radiological accidents and releases (on and off site)?*

### Response

The site safety record regarding radiological accidents has to be considered good. Within the broadest possible definition, accidents involving radioactive materials that have occurred at the plant are itemized below.

- a. In past years, leaks of chemical-uranium liquid waste from the liquid waste storage-evaporation lagoons have occurred into the soil beneath the lagoons. These leaks are further discussed in the response to question no. 6.6.
- b. In February, 1971, a  $UF_6$  transfer line became disconnected during the processing of a cylinder of  $UF_6$ , releasing a few kgs of uranium to the  $UO_2$  building. No measurable uranium escaped the building. There has not been a reoccurrence of this type of incident.
- c. In July, 1974, the liquid waste transfer line between the  $UF_6$ - $UO_2$  conversion quarantine tanks and the liquid waste storage-evaporation lagoons broke at a point above ground-level. Approximately 14 grams of uranium were discharged to the ground, but subsequently recovered and disposed of as solid radioactive waste. This break was repaired immediately, and there has not been a reoccurrence.
- d. In May, 1975, a faulty check-valve caused the liquid waste neutralization tank to overflow to the ground. Approximately 470 grams of uranium were discharged to the ground, but subsequently recovered and disposed of as solid radioactive waste. This situation was corrected promptly, and there has not been a reoccurrence.
- e. In September, 1976, a  $UF_6$  gas transfer line was broken during a  $UF_6$  cylinder hookup operation, releasing a few kgs of uranium to the  $UO_2$  building. No measurable uranium escaped the building. There has not been a reoccurrence of this type of incident.
- f. In December, 1976, approximately 40 kgs of  $UF_6$  were released to the  $UO_2$  building when a  $UF_6$  gas transfer line was detached from a  $UF_6$  cylinder whose valve was stuck open. Approximately 2.3 grams of uranium were released from the building. There has not been a reoccurrence of this type of incident. No uranium was detected offsite.

- g. In May, 1977, the liquid waste transfer line between the UF<sub>6</sub>-UO<sub>2</sub> conversion quarantine tanks and the liquid waste storage-evaporation lagoons was found to be leaking. The contaminated soil was removed and disposed of as solid radioactive waste. The line was replaced at that time, and a recent pressure test of that line confirms that it is presently not leaking.

1.11 Comment

*Have there been any changes in water quality standards or requirements?*

Response

No.

1.12 Comment

*Is there any change in the site's energy requirements?*

Response

The amount of electrical energy consumed at the site for the past 4-3/4 years has increased as shown below:

<u>Year</u>	<u>Million Kilowatt-Hours</u>
1976	20.32
1977	20.78
1978	24.36
1979	29.03
1980 (1st 3 quarters)	20.66



1.13 Comment

*How is the new 160-acre tract of land to be used?*

Response

The second quarter-section (160 acres) of land purchased by Exxon Nuclear is contiguous to the western boundary of the original site. Exxon Nuclear has no immediate plans to build anything on this land.

1.14 Comment

*Does this land addition introduce any new environmental issues such as wildlife, terrain, hydrology, or meteorology?*

Response

No -- not even when developed.

1.15 Comment

*What is the industrial population distribution out to a 5-mile radius in one mile increments?*

Response

The industrial population distribution within five miles (by compass sector and distance) of the Exxon Nuclear site is provided in Table 1.15 (attached).

1.16 Comment

*Are meteorological data gathered/maintained at the ENC site? If so, please provide data for the past 2 years.*

Response

No. However, Exxon Nuclear does subscribe to the Battelle Climatological Data service, which reports climatological data collected at the Hanford Meteorology Station. Copies of monthly reports for 1980 (January through October), and annual reports for 1979 and 1978 are provided in Enclosure 1.16 (attached).



1.17 Comment

*In the event it became necessary for ENC employees to evacuate a building/area, are there any means for enabling such employees to determine an upwind position from the accidental release point?*

Response

Currently, the wind direction at the Exxon Nuclear site can be readily determined by observing any of the following:

- a. Flag (during daylight hours, only).
- b. Steam plume from the  $\text{UO}_2$  building steam-generating facility.
- c. Trees on site.

However, in the first quarter of 1981, Exxon Nuclear plans to install an elevated wind direction indicating vane near the mobile command post.

1.18 Comment

*Is there a contingency plan for the protection of the  $\text{UF}_6$  storage area (if so, please provide copy) in the event of severe range fire, such as has occurred in the area in the past?*

Response

No. The area surrounding the  $\text{UF}_6$  cylinder storage area is void of flammable materials.

TABLE 1.1

Estimated Population Distribution (1980) Within 50-Miles of the Exxon Nuclear Site  
(By Compass Sector and Distance)

Compass Sector	Miles						TOTAL
	0-5	5-10	10-20	20-30	30-40	40-50	
N	0	0	140	520	1,350	1,050	3,060
NNE	0	20	250	530	4,450	1,420	6,670
NE	0	130	700	1,500	1,220	550	4,100
ENE	50	150	500	180	270	250	1,400
E	100	200	250	250	150	550	1,500
ESE	120	2,700	4,260	420	650	900	9,050
SE	2,730	3,780	48,880	2,600	1,160	690	59,840
SSE	13,750	13,030	15,160	410	1,920	1,900	46,170
S	13,710	5,680	4,550	4,670	11,680	3,030	43,320
SSW	960	320	450	260	2,600	1,200	5,790
SW	1,120	240	880	510	320	410	3,480
WSW	170	1,750	1,360	6,200	10,240	810	20,530
W	250	430	1,020	1,650	15,450	17,510	36,310
WNW	0	0	0	1,280	1,300	2,670	5,250
NW	0	0	0	110	590	1,160	1,860
NNW	0	0	0	10	300	1,580	1,890
TOTAL	32,960	28,430	78,400	21,100	53,650	35,680	250,220

TABLE 1.2-1

Projected Population Distribution (1985) Within 50-Miles of the Exxon Nuclear Site  
(By Compass Sector and Distance)

Compass Sector	Miles.						TOTAL
	0-5	5-10	10-20	20-30	30-40	40-50	
N	0	0	180	560	1,500	110	3,350
NNE	0	30	320	570	4,750	1,530	7,200
NE	0	150	840	1,560	1,350	610	4,510
ENE	70	170	510	180	280	270	1,480
E	150	300	390	300	150	570	1,860
ESE	280	2,950	4,400	430	670	930	9,660
SE	4,250	5,300	58,600	3,100	1,450	720	73,420
SSE	16,000	15,500	18,200	500	2,020	2,000	54,220
S	16,500	6,600	5,300	5,850	13,300	3,400	50,950
SSW	1,750	340	540	350	2,750	1,280	7,010
SW	1,200	250	950	600	330	430	3,760
WSW	170	2,000	1,500	7,600	10,550	830	22,650
W	260	450	1,080	1,750	16,800	18,800	39,140
WNW	0	0	0	1,650	1,230	2,800	5,780
NW	0	0	0	110	620	1,200	1,930
NNW	0	0	0	10	320	1,660	1,990
TOTAL	40,630	34,040	92,810	25,120	58,170	38,140	288,910

TABLE 1.2-2

Projected Population Distribution (1990) Within 50-Miles of the Exxon Nuclear Site  
(By Compass Sector and Distance)

Compass Sector	Miles						TOTAL
	0-5	5-10	10-20	20-30	30-40	40-50	
N	0	0	220	590	1,650	1,170	3,630
NNE	0	30	380	600	5,010	1,630	7,650
NE	0	170	980	1,620	1,500	680	4,950
ENE	100	200	530	190	290	290	1,600
E	200	350	470	340	160	590	2,110
ESE	370	3,150	4,520	440	700	970	10,150
SE	5,540	6,460	63,370	3,510	1,660	760	81,300
SSE	17,200	16,890	20,470	580	2,120	2,100	59,360
S	17,840	7,390	5,920	6,920	14,110	3,650	55,830
SSW	2,290	360	630	430	2,880	1,330	7,920
SW	1,230	270	1,020	710	340	450	4,020
WSW	180	2,020	1,580	8,660	10,780	850	24,070
W	280	470	1,130	1,820	17,470	19,310	40,480
WNW	0	0	0	1,940	1,360	2,920	6,220
NW	0	0	0	120	650	1,230	2,000
NNW	0	0	0	10	330	1,740	2,080
TOTAL	45,230	37,760	101,220	28,480	61,010	39,670	313,370

LAND USE WITHIN 50 MILE RADIUS OF EXXON NUCLEAR SITE

(Agricultural Areas) 

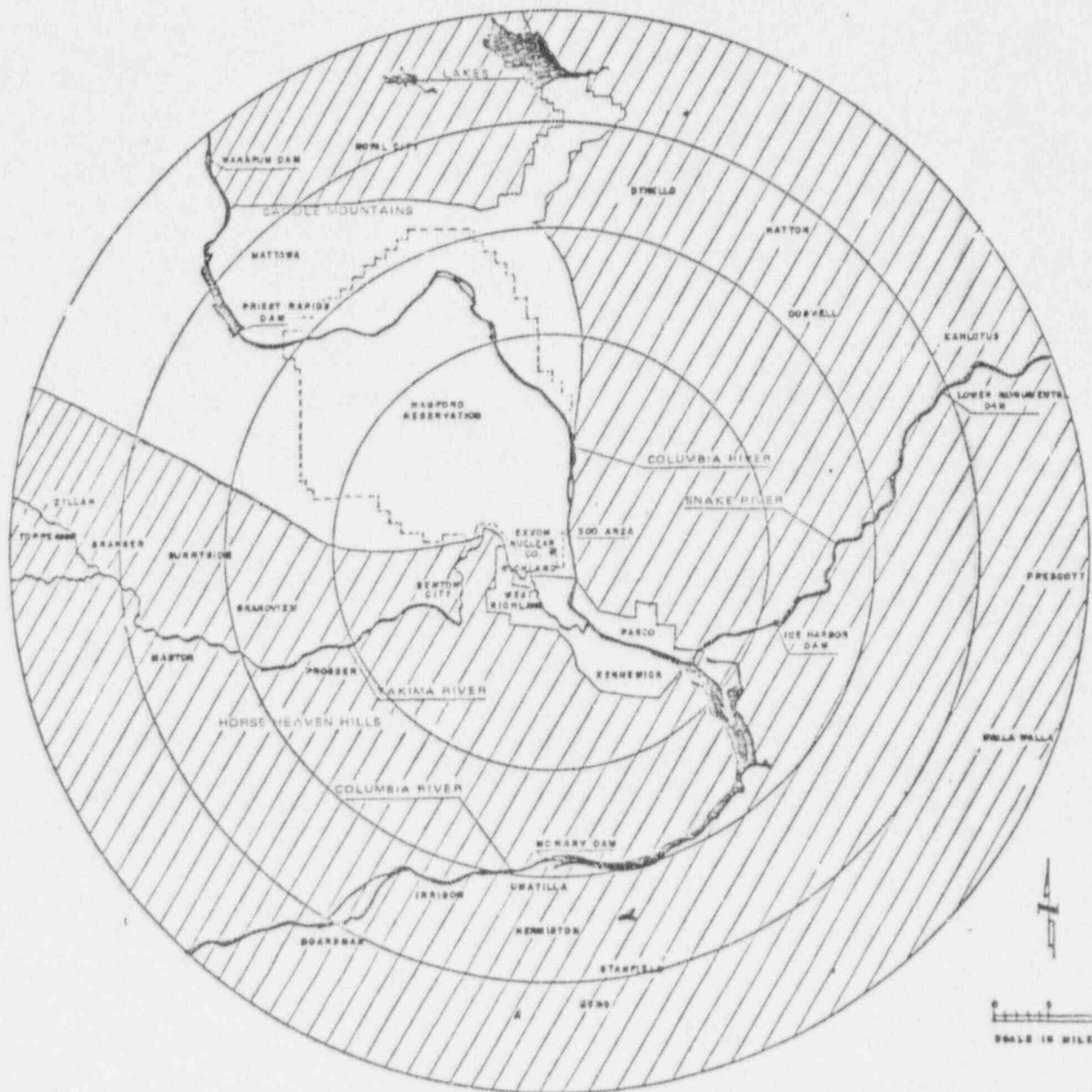






TABLE 1.15

Industrial Population Distribution (1980) Within 5-Miles of the Exxon Nuclear Site  
(By Compass Sector and Distance)

Compass Sector	Miles					TOTAL
	0-1	1-2	2-3	3-4	4-5	
N	0	0	0	0	0	0
NNE	0	100	100	0	0	200
NE	0	2445	465	0	0	2910
ENE	0	120	0	0	0	120
E	0	1620	0	0	0	1620
ESE	0	1140	0	0	0	1140
SE	0	750	20	0	0	770
SSE	0	630	325	60	0	1015
S	0	0	40	30	0	70
SSW	0	0	0	5	5	10
SW	0	0	0	5	5	10
WSW	0	0	0	0	0	0
W	0	0	0	0	0	0
WNW	0	0	0	0	0	0
NW	0	0	0	0	0	0
NNW	0	0	0	0	0	0
TOTAL	0	6805	950	100	10	7865

ENCLOSURE 1.16



## CLIMATOLOGICAL DATA

## HANFORD METEOROLOGY STATION

25 MILES N. W. OF RICHLAND, WASHINGTON

LATITUDE 46° 34' N., LONGITUDE 119° 35' W., ELEVATION (GROUND) 733 FEET

MONTH

October 1980

DATE	TEMPERATURE (°F., 3 FT. LEVEL)						PRECIP		WIND (50 FT. LEVEL)						FRONTS AND MISC. PHENOMENA		
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	HEATING DEGREE DAYS BASE 55	COOLING DEGREE DAYS BASE 55	TOTAL WTR. EQUIVALENT IN IN.	SHOW.	ICE PELLETS (SLEET) (IN.)	SHOW, ICE PELLETS (SLEET) OR ICE ON GROUND AT 0400 (IN.)	PREVAILING DIRECTION	AVERAGE SPEED (MPH)	PEAK GUST	AVERAGE REL. HUM.	SOLRAD (LANGLEYS)	SKY COVER (EIGHTHS FROM SUNRISE TO SUNSET)	NOTE: TIMES OF FRONTAL PASSAGES ARE GIVEN AFTER THE NOTATIONS "KFR" (COLD FRONT) AND "WFR" (WARM FRONT)
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17
1	76	48	62	+1	3	0				NW	8.2	18	NW	52	379	0	RECEIVED
2	76	50	63	+3	2	0				NW	8.9	18	NNW	45	376	0	
3	80	45	62	+2	3	0				S	4.5	15	NW	50	350	0	NOV 17 1980
4	89	44	66	+7	0	1				N	3.1	10	S	49	353	0	L. A. BISPING
5	85	50	68	+9	0	3				NW	7.6	15	NW	39	352	0	
6	85	52	68	+10	0	3				W	4.2	14	WNW	39	337	0	
7	86	48	67	+9	0	2				NW	4.3	13	W	51	328	0	
8	78	50	64	+7	1	0				NW	16.8	43	NW	42	335	1	BD KFR 0010
9	68	41	54	-3	11	0				NW	8.1	16	N	43	345	0	
10	68	41	54	-2	11	0				N	5.4	18	NW	46	301	7	
11	66	36	51	-5	14	0				SE	1.7	9	SSE	57	236	10	
12	53	47	55	0	10	0	0.05			SW	6.4	27	SW	74	81	10	
13	60	48	54	-1	11	0	0.04			SE	5.6	13	SW	77	137	10	
14	59	48	52	-2	13	0	0.05			W	7.1	20	NW	71	127	10	
15	58	47	58	+4	7	0	0.01			N	7.1	21	NNE	64	231	7	
16	66	37	52	-1	13	0				N	6.0	15	SSE	57	301	1	
17	66	33	50	-3	15	0				N	3.2	14	SE	63	292	0	
18	67	36	52	0	13	0				N	2.3	9	SSE	54	285	1	
19	66	36	51	0	14	0				W	3.4	10	WNW	59	271	5	
20	66	38	52	+1	13	0	T			N	4.0	20	WNW	60	146	9	KFR 2030
21	63	38	50	0	15	0				W	13.8	32	NW	34	283	0	
22	60	31	46	-4	19	0				W	5.9	14	N	44	281	2	
23	56	33	44	-5	21	0				W	6.3	14	NW	46	256	9	
24	58	36	47	-2	18	0	0.06			NW	5.2	15	WNW	46	187	10	
25	53	39	46	-2	19	0	0.12			N	1.4	7	NE	65	146	8	F KFR 0330
26	50	34	42	-6	23	0				NW	3.2	11	WNW	87	101	9	F
27	49	30	40	-7	25	0				NW	2.8	9	NW	92	127	10	F
28	54	34	44	-3	21	0				W	2.7	10	WNW	85	203	9	F
29	42	30	36	-10	29	0				S	1.8	10	S	97	77	10	F
30	44	32	38	-8	27	0				E	1.2	8	ENE	95	97	10	F
31	46	38	42	-3	23	0	T			W	1.7	10	S	89	64	10	F
SUM					1394	9	0.33	0									
AVG	54.9	40.4									5.3				5.1		

## NOTES:

(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.

(2) "T" IN COLUMNS 7 - 9 DENOTES A TRACE.

(3) THE LANGLEY (COL. 15) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM<sup>2</sup>

## PRECIPITATION (IN)

TOTAL FOR THE MONTH	0.33
DEPARTURE FROM NORMAL	-0.28
GREATEST IN 24 HRS.	0.18 ON 24 & 25
NUMBER OF DAYS WITH:	
TRACE OR MORE	8
0.01 OR MORE	6
0.10 OR MORE	1

## MISC. PHENOMENA NOTATIONS USED IN COL. 17

A - HAIL	BD - BLOWING DUST
AU - AURORA	SS - SLOWING SNOW
D - DUST	DL - DISTANT LIGHTNING
F - FOG	DR - DRIFTING SNOW
SL - SLATE	IC - ICE CRYSTALS
X - SMOKE	T - THUNDERSTORM

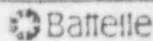
TEMPERATURE (°F., 3 FT. LEVEL)				PRECIPITATION (IN)				MISC. PHENOMENA NOTATIONS USED IN COL. 17			
AVERAGE FOR THE MONTH	52.6	0.01 OR MORE	6	0.50 OR MORE	0	AVERAGE STATION	29.334				
DEPARTURE FROM NORMAL	-0.4	0.10 OR MORE	1	1.00 OR MORE	0	HIGHEST SEA LEVEL	20.63 ON 28				
HIGHEST	89	ON	4	SNOW, ICE PELLETS (SLEET) (INCHES)		LOWEST SEA LEVEL	29.70 ON 12				
LOWEST	30	ON	29+	TOTAL FOR THE MONTH	0	SOLAR RADIATION (LANGLEYS)					
NUMBER OF DAYS WITH:				GREATEST IN 24 HOURS:	ON	AVERAGE DAILY TOTAL	238.2				
MAX. 32 OR BELOW	0			GREATEST ON GND:	ON	GREATEST DAILY	379 ON 1				
MAX. 20 OR ABOVE	0			WIND (50 FT. LEVEL)		LEAST DAILY	64 ON 31				
MIN. 32 OR BELOW	4			AVERAGE SPEED (MPH)	5.3	MISCELLANEOUS NUMBER OF DAYS					
MIN. 20 OR ABOVE	0			DEPARTURE FROM NORMAL	-1.4	CLEAR	14	FOG	7		
HEATING DEGREE DAYS (BASE 65°F)				PEAK GUST	43 FROM NW ON 8	PARTLY CLOUDY	3	THUNDER	0		
TOTAL FOR THE MONTH	394			AVERAGE PSYCHROMETRIC DATA		CLOUDY	14	DUST	1		
DEPARTURE FROM NORMAL	+21			DRY BULB (°F)	52.1	REL. HUM. EXTREMES (%)					
SEASONAL TOTAL (SINCE JULY 1)	470			REL. HUM. (%)	60.4	HIGHEST	100 ON 30+				
SEASONAL DEPARTURE FROM NORMAL	+22			DEW PT (°F)	36.3	LOWEST	11 ON 4				
				+	DENOTES LATEST OF SEVERAL DATES						

HW - 13-0-323 (1-73) LOCAL RICHLAND, WASH.

14 DAYS = 840 + 14 = 60°F

17 DAYS = 790

17 DAYS = 790



## CLIMATOLOGICAL DATA

## HANFORD METEOROLOGY STATION

25 MILES N. W. OF RICHLAND, WASHINGTON

LATITUDE 46° 34' N., LONGITUDE 119° 35' W., ELEVATION (GROUND) 733 FEET

MONTH

September 1980

DATE	TEMPERATURE (PR-3 FT. LEVEL)						PRECIP				WIND (50 FT. LEVEL)							FRONTS AND MISC. PHENOMENA		
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	DEGREE DAYS		TOTAL (WTR. EQUIVALENT IN IN.)	SNOW	ICE PELLETS (SLEET) (IN.)	SHOW, ICE PELLET, SLEET OR ICE ON GROUND AT 0300 (IN.)	PREVAILING DIRECTION	AVERAGE SPEED (MPH)	PEAK GUST		AVERAGE REL. HUMIDITY	SOLAR (LANGLEY'S)	DAY COVER (PERCENT FROM SUNRISE TO SUNSET)			
					BASE 55								SPEED (MPH)	DIRECTION						
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17			
1	80	44	62	-9	3	0	0.04			SW	7.7	22	WSW	51	348	9				
2	76	53	64	-7	1	0	T			NW	15.3	36	NW	45	517	1	KFR 0300			
3	77	44	60	-10	5	0				E	5.9	18	ESE	42	469	4				
4	86	44	65	-5	0	0				E	5.1	17	E	39	496	4				
5	90	49	70	0	0	5				W	5.0	15	SSE	36	493	0				
6	95	57	76	+7	0	11				W	7.4	31	WSW	36	421	5	DL, T KFR 2130			
7	85	60	72	+3	0	7				NW	10.4	28	NW	38	428	4	DL			
8	84	56	70	+1	0	5				NW	10.2	27	N	26	487	0				
9	88	61	74	+6	0	9				NW	8.5	17	NW	29	467	1				
10	86	63	74	+6	0	9				NW	7.8	22	SE	33	308	9				
11	89	64	76	+8	0	11				NW	14.4	35	NW	32	446	1				
12	81	57	69	+2	0	4	T			NW	7.9	24	NW	45	277	10				
13	59	54	56	-11	9	0	0.79			W	8.3	18	WNW	88	68	9	F			
14	78	55	66	-1	0	1	0.01			W	6.3	18	NE	65	422	3				
15	81	53	67	+1	0	2				W	5.5	13	SW	54	426	2				
16	89	53	71	+5	0	6				W	6.7	21	WNW	50	440	0				
17	87	56	72	+6	0	7				NW	7.3	22	WNW	42	431	0				
18	71	57	64	-1	1	0	T			W	9.7	28	WSW	53	107	10	DL			
19	71	56	64	-1	1	0				SW	16.7	36	WSW	50	193	9	KFR 2150			
20	72	47	60	-5	5	0	0.01			W	10.8	28	WNW	51	322	6				
21	70	42	56	-8	9	0				W	7.2	23	NW	48	276	4				
22	71	41	56	-8	9	0	T			W	4.2	16	WNW	56	241	9				
23	77	51	64	0	1	0				NW	8.3	23	WNW	48	410	0				
24	75	50	62	-1	3	0				NW	6.4	20	NW	44	394	4				
25	76	48	62	-1	3	0				NW	7.8	15	NW	45	383	6				
26	79	53	66	+3	0	1				NW	6.3	16	WNW	51	356	8				
27	77	47	62	0	3	0				E	4.8	23	WSW	58	322	6				
28	79	51	65	+3	0	0				W	9.4	30	WSW	53	368	7				
29	85	46	66	+4	0	1				SW	8.0	27	WSW	54	352	4				
30	74	57	66	+5	0	1				NW	11.2	26	NW	52	321	9				
31																				
SUM					53	80	0.85	0												
AVG	79.652	3									8.4					4.8				

## NOTES:

(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.

(2) WITH IN COLUMNS 7 &amp; 8 DENOTES A TRACE.

(3) THE LANGLEY (COL. 15) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM<sup>2</sup>

TEMPERATURE (PR-3 FT. LEVEL)				PRECIPITATION (IN)				MISC. PHENOMENA NOTATIONS USED IN COL. 17			
AVERAGE FOR THE MONTH				TOTAL FOR THE MONTH				A - HAIL			
DEPARTURE FROM NORMAL				DEPARTURE FROM NORMAL				AU - AURORA			
HIGHEST				GREATEST IN 24 HRS.				D - DUST			
LOWEST				NUMBER OF DAYS WITH:				F - FOG			
NUMBER OF DAYS WITH:				TRACE OR MORE				GL - GLAZE			
MAX. 32 OR BELOW				0.01 OR MORE				K - SMOKE			
MAX. 30 OR ABOVE				0.05 OR MORE				SD - BLOWING DUST			
MIN. 32 OR BELOW				0.10 OR MORE				SS - BLOWING SNOW			
MIN. 30 OR ABOVE				1.00 OR MORE				DL - DISTANT LIGHTNING			
HEATING DEGREE DAYS (BASE 65°F)				SNOW, ICE PELLETS (SLEET) (INCHES)				DR - DRIFTING SNOW			
TOTAL FOR THE MONTH				TOTAL FOR THE MONTH				IC - ICE CRYSTALS			
DEPARTURE FROM NORMAL				GREATEST IN 24 HOURS:				T - THUNDERSTORM			
SEASONAL TOTAL (SINCE JULY 1)				GREATEST ON GND:				BAROMETRIC PRESSURE (IN.)			
SEASONAL DEPARTURE FROM NORMAL				WIND (50 FT. LEVEL)				AVERAGE STATION			
				AVERAGE SPEED (MPH)				HIGHEST SEA LEVEL			
				DEPARTURE FROM NORMAL				LOWEST SEA LEVEL			
				PEAK GUST				SOLAR RADIATION (LANGLEY'S)			
				AVERAGE PSYCHROMETRIC DATA				AVERAGE DAILY TOTAL			
				DRY BULB (°F)				GREATEST DAILY			
				REL. HUM. (%)				LEAST DAILY			
				DEW PT. (°F)				MISCELLANEOUS NUMBER OF DAYS			
				- DENOTES LATEST OF SEVERAL DATES				CLEAR			
								PARTLY CLOUDY			
								CLOUDY			
								REL. HUM. EXTREMES (%)			
								HIGHEST			
								LOWEST			



## CLIMATOLOGICAL DATA

## HANFORD METEOROLOGY STATION

25 MILES N. W. OF RICHLAND, WASHINGTON

LATITUDE 46° 34' N., LONGITUDE 119° 36' W., ELEVATION (GROUND) 733 FEET

MONTH

August 1980

DATE	TEMPERATURE (°F, 3 FT. LEVEL)					PRECIP			WIND (50 FT. LEVEL)					FRONTS AND MISC. PHENOMENA		
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	HEATING DEGREE DAYS (BASE 65°)	TOTAL INTN. EQUIVALENT IN IN.	SNOW, ICE PELLETS (IN.)	MOON, ICE PELLETS (IN.)	PREVAILING DIRECTION	AVERAGE SPEED (MPH)	PEAK DUST	AVERAGE REL. HUM. %	SOLAR (LANGLEYS)	SKY COVER (%)	TIMES OF FRONTAL PASSAGES	NOTE:
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	17
1	78	0	0	13					NW	12.8	34	NW	30	638	1	
2	72	-5	0	7					NW	13.7	38	NW	41	472	6	BD
3	72	-5	0	7					NW	9.8	25	NW	34	659	1	
4	70	-7	0	5					NW	9.5	32	NW	34	634	0	
5	70	-7	0	5					W	10.0	29	NW	36	530	3	
6	71	-6	0	6					W	7.1	18	WNW	34	624	3	DL
7	74	-3	0	9					NW	7.6	20	E	34	616	0	St. Helens eruption
8	76	0	0	11	T				NW	11.7	29	N	28	394	6	BD
9	76	0	0	11					W	5.5	14	N	33	600	1	
10	76	0	0	11					W	5.3	17	N	30	558	4	
11	84	+8	0	19					NW	9.7	24	NW	24	479	7	
12	81	+5	0	16					NW	7.2	20	NNW	31	542	3	T
13	82	+7	0	17					NW	8.3	24	WNW	33	551	4	
14	76	+1	0	11					NW	11.4	37	NW	36	548	3	
15	70	-5	0	5					W	9.3	33	WNW	37	562	4	
16	72	-3	0	7					NW	7.7	30	WNW	39	569	4	
17	68	-7	0	3	T				W	12.1	38	WNW	42	253	9	DL KFR 2235
18	60	-14	5	0	0.02				NW	11.7	30	WNW	52	207	8	
19	66	-8	0	1					NW	6.1	23	NW	48	567	0	
20	71	-3	0	6					NW	7.7	21	WNW	28	576	0	
21	69	-5	0	4					N	6.8	20	WNW	28	545	3	
22	74	+1	0	9					NW	9.5	24	NW	30	545	2	
23	73	0	0	8					NW	10.1	31	NW	32	547	1	
24	71	-2	0	6					NW	10.0	24	WNW	32	553	0	
25	69	-4	0	4					NW	6.1	15	SSE	29	538	4	
26	69	-3	0	4					W	8.9	28	WNW	36	505	7	KFR 1615
27	66	-6	0	1					W	12.8	29	WSW	41	465	3	
28	58	-14	7	0					W	8.4	24	WNW	38	530	1	
29	60	-11	5	0					E	4.9	16	ENE	37	524	5	
30	64	-7	1	0	T				W	8.7	28	WSW	50	274	9	
31	66	-5	0	1					NW	9.2	31	NW	48	345	7	
SUM	18	207	0.02	0												
AVG	25.1	55.2	9.0	3.6												

NOTES				PRECIPITATION (IN)				MISC. PHENOMENA NOTATIONS USED IN COL. 17			
(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.				TOTAL FOR THE MONTH				A - HAIL			
(2) "T" IN COLUMNS 7 - 9 DENOTES A TRACE.				DEPARTURE FROM NORMAL				AU - AURORA			
(3) THE LANGUET (COL. 13) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM <sup>2</sup>				GREATEST IN 24 HRS.				D - DUST			
TEMPERATURE (°F, 3 FT. LEVEL)				NUMBER OF DAYS WITH:				F - FOG			
AVERAGE FOR THE MONTH				TRACE OR MORE				GL - GLAZE			
DEPARTURE FROM NORMAL				0.01 OR MORE				K - SMOKE			
HIGHEST				0.10 OR MORE				BD - BLOWING DUST			
LOWEST				0.50 OR MORE				BS - BLOWING SNOW			
NUMBER OF DAYS WITH:				GREATEST IN 24 HOURS				DL - DISTANT LIGHTNING			
MAX 32 OR BELOW				GREATEST ON GND				DS - DRIFTING SNOW			
MAX 50 OR ABOVE				WIND (50 FT. LEVEL)				IC - ICE CRYSTALS			
MIN 32 OR BELOW				AVERAGE SPEED (MPH)				T - THUNDERSTORM			
MIN 50 OR ABOVE				DEPARTURE FROM NORMAL				BAROMETRIC PRESSURE (IN.)			
HEATING DEGREE DAYS (BASE 65°F)				PEAK DUST				AVERAGE STATION			
TOTAL FOR THE MONTH				AVERAGE PSYCHROMETRIC DATA				HIGHEST SEA LEVEL			
DEPARTURE FROM NORMAL				DRY BULB (°F)				LOWEST SEA LEVEL			
SEASONAL TOTAL SINCE JULY 1				REL. HUM. (%)				SOLAR RADIATION (LANGLEYS)			
SEASONAL DEPARTURE FROM NORMAL				+ DENOTES LATEST OF SEVERAL DATES				AVERAGE DAILY TOTAL			
								GREATEST DAILY			
								LEAST DAILY			
								MISCELLANEOUS NUMBER OF DAYS			
								CLEAR			
								PARTLY CLOUDY			
								CLOUDY			
								REL. HUM. EXTREMES (%)			
								HIGHEST			
								LOWEST			

RECEIVED

SEP 12 1980

L.A. BISPING





## 25 MILES N. W. OF RICHLAND, WASHINGTON

LATITUDE 46° 34' N. LONGITUDE 119° 35' W. ELEVATION (GROUND) 733 FEET

MONTH

July 1980

RECEIVED  
AUG 13 1980  
LA BISPING

84-1869-223 (1 of 7) REC'D - CHICAGO, ILL

## CLIMATOLOGICAL DATA

25 MILES N. W. OF RICHLAND, WASHINGTON  
LATITUDE 46° 34' N., LONGITUDE 119° 36' W., ELEVATION (GROUND) 733 FEET

June 1980

TEMPERATURE (29.3 FT. LEVEL)										PRECIP		WIND (50 FT. LEVEL)					FRONTS AND MISC. PHENOMENA				
DATE	HIGHEST	LOWEST	AVERAGE	DEPARTURE FROM NORMAL	DEGREE DAYS		TOTAL WITH EQUIVALENT IN IN.	SHOW	ICE PELLETS (SLEET) IN IN.	SNOW, ICE PELLETS (SLEET) FOR ICE ON GROUND AT 0400 HRS.	PREVAILING DIRECTION	AVERAGE WIND SPEED (MPH)	PEAK GUST	DIRECTION	AVERAGE REL HUM.	SOLRAD (LANGLEYS)	SEA LEVEL (FEET) (FROM SURFACE TO SURFACE)	SEA COVER (PERCENT)	THUNDER (YES/NO)	MISC. PHENOMENA	
					BASE 55	COOLING															
1	72	46	59	-6	6	0	T				NW	14.0	35	WNW	44	583	7		BD (ash)		
2	55	40	52	-14	13	0					W	5.3	19	W	44	403	7				
3	59	44	56	-10	9	0					W	5.6	24	N	51	428	8		DL		
4	74	40	57	-9	8	0					W	7.9	25	NW	43	639	2		D (ash)		
5	72	50	61	-6	4	0					NW	9.9	25	WNW	39	489	9				
6	74	47	60	-7	5	0					S	5.5	18	S	46	553	9				
7	80	52	66	-4	0	1					NW	7.2	17	E	50	541	9				
8	88	55	72	-4	0	7					NW	9.8	28	NW	44	671	3		K		
9	80	61	70	-2	0	5	T				NW	11.4	28	WNW	40	(490)	8		SOLRAD est'd		
10	82	50	66	-2	0	1					W	7.1	25	NW	42	628	6				
11	82	56	69	-1	0	4					NW	7.9	25	NW	39	592	9				
12	69	55	62	-6	3	0	0.22				SW	7.8	24	W	72	168	10		F		
13	59	50	54	-13	11	0	0.35				E	3.5	12	W	90	123	10				
14	75	51	63	-6	2	0					SW	7.0	26	NW	66	540	9				
15	77	54	66	-3	0	1					E	5.6	22	WNW	59	460	6				
16	86	54	70	-1	0	5	0.14				NW	8.9	39	NW	62	662	2		T, DL, BD		
17	79	49	64	-6	1	0					W	7.4	24	WNW	50	727	4		KFR 1730		
18	84	57	70	-10	0	5					W	7.8	24	NW	41	693	2				
19	87	53	70	-10	0	5					NE	4.2	15	E	40	700	4				
20	85	59	72	-2	0	7	0.19				NW	6.5	22	NW	54	505	8		T, DL		
21	85	60	72	-1	0	7	T				W	10.2	28	WNW	43	507	8		DL		
22	76	57	66	-3	0	1	0.01				SW	9.0	28	NW	46	438	10		T, DL		
23	78	53	66	-3	0	1					SW	11.5	28	NW	36	674	3				
24	80	50	65	-6	0	0	0.02				W	6.0	37	W	48	469	10		DL		
25	72	56	64	-7	1	0	0.02				W	11.5	30	WSW	58	353	9		KFR 1900		
26	74	51	62	-10	3	0	0.01				W	12.0	35	WNW	47	329	9				
27	77	50	64	-8	1	0					NW	11.0	29	WNW	44	569	6				
28	84	45	64	-8	1	0					NW	7.3	34	NW	42	718	0				
29	82	56	69	-3	0	4					NW	13.1	33	NW	33	724	0				
30	82	53	68	-4	0	3					NW	6.8	19	N	34	716	0				
31																					
SUM					68	57	0.96														
AVG	77.6	51.3																			
NOTES:																					
(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.										PRECIPITATION (IN)					MISC. PHENOMENA NOTATIONS USED IN COL. 17						
(2) "T" IN COLUMNS 7 - 9 DENOTES A TRACE.										TOTAL FOR THE MONTH					A - HAIL						
(3) THE LANGLEY (COL. 18) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM <sup>2</sup>										DEPARTURE FROM NORMAL					AU - AURORA						
										GREATEST IN 24 HRS.					B - DUST						
										NUMBER OF DAYS WITH:					C - FOG						
										TRACE OR MORE					D - GLAZE						
										11					E - SMOKE						
										0.01 OR MORE					BAROMETRIC PRESSURE (IN.)						
										8					AVERAGE STATION						
										0.10 OR MORE					HIGHEST SEA LEVEL						
										4					LOWEST SEA LEVEL						
										SNOW, ICE PELLETS (SLEET) (INCHES)					SOLAR RADIATION (LANGLEYS)						
										TOTAL FOR THE MONTH					AVERAGE DAILY TOTAL						
										GREATEST IN 24 HOURS					GREATEST DAILY						
										GREATEST ON GND					LEAST DAILY						
										WIND (50 FT. LEVEL)					MISCELLANEOUS NUMBER OF DAYS						
										AVERAGE SPEED (MPH)					CLEAR						
										DEPARTURE FROM NORMAL					PARTLY CLOUDY						
										PEAK GUST					CLOUDY						
										AVERAGE PSYCHROMETRIC DATA					REL. HUM. EXTREMES (%)						
										TOTAL FOR THE MONTH					HIGHEST						
										DEPARTURE FROM NORMAL					LOWEST						
										SEASONAL TOTAL SINCE JULY 1					REL. HUM. (%)						
										SEASONAL DEPARTURE FROM NORMAL					HIGHEST						
										REL. HUM. (%)					LOWEST						
										WIND (50 FT. LEVEL)					REL. HUM. (%)						
										AVERAGE SPEED (MPH)					HIGHEST						
										DEPARTURE FROM NORMAL					LOWEST						
										PEAK GUST					REL. HUM. (%)						



## CLIMATOLOGICAL DATA

25 MILES N. W. OF RICHLAND, WASHINGTON  
LATITUDE 46° 34' N., LONGITUDE 119° 35' W., ELEVATION (GROUND) 733 FEET

May 1980

DATE	TEMPERATURE (2-3 FT. LEVEL)						PRECIP		WIND (30 FT. LEVEL)						FRONTS AND MISC. PHENOMENA		
	DEGREE DAYS						TOTAL INCHES	WET DAYS	DIRECTION	SPEED (MPH)	SPEED (KMPH)	DIRECTION	AVERAGE KNOTS	WIND HOURS	WIND HOURS	NEW COOL (TEMP. FALLING FROM SUMMER TO SUMMER)	NOTES:
	MAX	MIN	AVERAGE	DEPARTURE FROM NORMAL	BASE 55	COOLING											
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17
1	52	43	60	+7	5	0				E	3.7	14	SSE	61	592	1	DL
2	52	52	65	+7	0	0				NW	13.0	31	NW	40	538	7	KFR 0100
3	52	38	58	0	7	0				NE	4.6	18	WNW	42	631	1	
4	52	52	70	+12	0	5				N	7.8	17	NW	41	619	0	
5	52	53	70	+12	0	5	.02			NW	6.8	48	SW	53	439	8	DL, T KFR 1610
6	52	52	62	+3	3	0	.10			W	8.5	33	NW	57	504	5	
7	52	42	60	0	5	0				W	6.0	18	W	46	637	0	
8	52	43	61	+1	4	0	T			W	10.0	26	WNW	47	514	10	
9	52	48	58	+2	7	0	.08			SE	5.9	17	NNW	62	388	9	RECEIVED
10	52	49	56	+1	9	0	.15			NW	8.0	21	NNE	76	158	10	JUN 24 1980
11	52	50	64	+3	1	0				W	8.6	26	NNE	44	638	1	
12	52	52	63	+1	0	0	.05			W	8.7	33	WNW	53	424	9	DL, T
13	52	43	60	-1	5	0				W	6.7	22	WNW	48	619	9	L. A. BISPING
14	52	52	58	-3	7	0	.03			NW	11.2	26	WNW	55	259	10	
15	52	43	56	-6	9	0	T			W	7.5	27	SW	43	433	7	DL
16	52	42	53	-4	7	0				W	7.2	20	NW	41	665	0	
17	52	48	64	+2	1	0				NW	5.5	19	WNW	45	633	6	
18	52	48	58	-1	7	0				SW	3.1	11	S	66	127	8	DL, T, D(ash) St. Helens-
19	52	51	66	+3	0	1				W	8.5	24	SW	47	348	10	BD (ash) Eruption
20	52	57	72	+9	0	7				SW	7.1	22	SW	38	404	9	BD (ash)
21	52	55	70	+7	0	5	.02			W	10.6	30	W	51	554	7	D (ash) KFR 1613
22	52	49	59	+1	6	0	.05			W	13.4	30	WSW	43	615	4	D (ash)
23	52	41	56	-7	9	0				NW	11.6	34	NW	35	611	9	D (ash)
24	52	51	59	-3	6	0				NW	15.5	34	WNW	38	372	10	D (ash)
25	52	49	58	-5	7	0	.11			NW	21.1	40	NW	45	250	10	D (ash) BD
26	52	43	51	-13	14	0	.79			W	8.6	23	WNW	86	118	10	
27	52	48	56	-3	9	0	.01			S	2.9	20	WNW	72	249	10	
28	52	43	59	-3	6	0	T			NW	5.7	22	NW	59	565	6	
29	52	48	62	-3	3	0				NW	9.7	29	NW	47	512	10	
30	52	50	64	-1	1	0				W	7.0	24	NE	49	595	8	BD, DL
31	52	53	66	+3	0	3	T			NW	9.1	28	NW	43	601	5	
SUM					138	26	1.41	0									
AVG																	
NOTES: (1) - UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME. (2) - WITH IN COLUMNS 7 - 9 DENOTES A TRACE. (3) - THE LAPSE RATE (COL. 18) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM 2																	
PRECIPITATION (IN) TOTAL FOR THE MONTH 1.41 DEPARTURE FROM NORMAL +.98 GREATEST IN 24 HRS. .90 ON 25-26 NUMBER OF DAYS WITH: TRACE OR MORE 15 0.25 OR MORE 1 0.51 OR MORE 11 0.50 OR MORE 1 1.00 OR MORE 4 1.00 OR MORE 0																	
TEMP. (2-3 FT. LEVEL) AVERAGE FOR THE MONTH 61.4 DEPARTURE FROM NORMAL -0.3 HIGHEST 87 ON 20+ LOWEST 38 ON 3 NUMBER OF DAYS WITH: MAX. 32 OR BELOW 0 MAX. 50 OR ABOVE 0 MIN. 32 OR BELOW 0 MIN. 50 OR BELOW 0																	
HEATING DEGREE DAYS (BASE 55) TOTAL FOR THE MONTH 138 DEPARTURE FROM NORMAL -15 SEASONAL TOTAL SINCE JULY 1 5343 SEASONAL DEPARTURE FROM NORMAL +110																	
WIND (30 FT. LEVEL) AVERAGE SPEED (MPH) 8.5 DEPARTURE FROM NORMAL -0.3 PEAK GUST 48 FROM SW ON 5																	
AVERAGE PSYCHROMETRIC DATA DRY BULB (°F) 61.6 WET BULB (°F) 51 REL. HUM. (%) 51 DEW PT. (°F) 41.3 HIGHEST 96 ON 10 LOWEST 18 ON 11																	
MISC. PHENOMENA NOTATIONS USED IN COL. A - HAIL AU - AURORA D - DUST F - FOG GL - GLAZE K - SMOKE BD - BLOWING DUST BS - BLOWING SNOW DL - DISTANT LIGHTNING DS - DRIFTING SNOW IC - ICE CRYSTALS T - THUNDERSTORM BAROMETRIC PRESSURE (IN.) AVERAGE STATION 29.105 HIGHEST SEA LEVEL 30.18 ON 17 LOWEST SEA LEVEL 29.54 ON 9 SOLAR RADIATION (LANGLEY) AVERAGE DAILY TOTAL 472 GREATEST DAILY 665 ON 16 LEAST DAILY 118 ON 26 MISCELLANEOUS NUMBER OF DAYS CLEAR 6 FOG 0 PARTLY CLOUDY 8 THUNDER 3 CLOUDY 17 DUST 9																	

CLIMATOLOGICAL DATA

25 MILES N. W. OF RICHLAND, WASHINGTON  
LATITUDE 46° 34' N., LONGITUDE 119° 35' W., ELEVATION (GROUND) 733 FEET

April 1980

TEMPERATURE (P.R. 3 FT. LEVEL)								PRECIP			WIND (50 FT. LEVEL)			FRONTS AND MISC. PHENOMENA						
DATE	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	DEGREE DAYS (BASE 65)		TOTAL WITH EQUIVALENT IN IN.	SNOW (IN.)	ICE PELLETS (IN.)	SHOW, ICE PELLETS (IN.) OR ICE ON GROUND AT 0800 (IN.)	PREVAILING DIRECTION	AVERAGE SPEED (MPH)	PEAK GUST		AVERAGE REL. HUM. %	SOLAR (LANGLEYS)	DAY COVER (PERCENT)	HIGHEST WIND DIRECTION TO SUNSET	NOTE:	
					HEATING	COOLING							SPEED (MPH)	DIRECTION						
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	60	35	48	+1	17	0				NW	11.3	32	NE	44	434	7				
2	59	33	46	-2	19	0	T			NE	10.8	33	NE	42	347	6				
3	63	29	46	-2	19	0	T			SE	4.7	19	S	48	496	2				
4	66	41	54	+6	11	0	0.05			NW	7.1	18	SW	51	435	7				
5	62	43	52	+3	13	0	0.02			SW	14.3	42	WSW	55	362	4				
6	58	34	46	-3	19	0	0.04			W	12.0	32	W	53	345	9				
7	58	28	43	-6	22	0				S	7.2	26	SE	46	475	4				
8	59	39	49	0	16	0	T			SE	5.3	14	NW	53	194	10				
9	61	45	53	+3	12	0	0.12			W	16.7	42	WSW	60	404	8				
10	62	36	49	-1	16	0				W	11.0	30	NW	43	559	3				
11	67	32	50	-1	13	0				NE	4.9	14	NE	47	538	1				
12	72	46	59	+3	6	0				W	5.3	12	WSW	45	511	8				
13	77	40	58	+6	7	0				W	5.8	12	WNW	45	508	7				
14	70	50	60	+8		0				SW	15.4	43	SW	47	350	8				
15	69	40	54	+2	11	0				W	8.5	27	WSW	43	552	1				
16	72	35	54	+1	11	0				NW	6.3	17	NW	49	553	1				
17	77	44	60	+7	5	0	T			W	10.2	37	W	40	362	9				
18	76	40	58	+5	7	0				E	5.3	16	WSW	48	503	6				
19	74	53	64	+10	1	0	0.02			W	7.6	28	WSW	50	274	10				
20	56	49	52	-2	13	0	0.56			NW	7.0	28	NW	81	137	10				
21	66	47	56	+1	9	0	T			NW	8.3	28	NW	63	251	8				
22	73	45	59	+4	6	0				NW	6.2	27	WNW	57	529	10				
	75	46	60	+5	5	0				NW	6.3	23	NW	54	563	6				
24	73	43	58	+2	7	0				W	11.7	31	WSW	39	580	4				
25	71	37	54	-2	11	0				N	4.6	15	ENE	51	589	5				
26	80	50	65	+9	0	0				NW	7.3	16	NW	47	590	2				
27	87	51	69	+12	0	4				W	4.3	15	SSE	48	586	0				
28	85	51	68	+11	0	3	0.01			W	9.5	33	WNW	53	460	8	T			
29	68	42	55	-2	10	0				W	16.8	36	WNW	36	630	1				
30	66	45	56	-2	9	0	0.04			W	6.6	23	WNW	55	459	6				
31																				
SUM	302 7 0.86 0																			
AVG	68.741.6																			
NOTES:																				
(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.								PRECIPITATION (IN.)				MISC. PHENOMENA NOTATIONS USED IN COL. 17								
(2) "T" IN COLUMNS 7 & 8 DENOTES A TRACE.								TOTAL FOR THE MONTH				A - HAIL								
(3) THE LANGLEY (COL. 16) IS THE UNIT USED TO MEASURE THE GRAIN CALORIE - CM 2								DEPARTURE FROM NORMAL				AU - AURORA								
								GREATEST IN 24 HRS.				C - CUST								
								NUMBER OF DAYS WITH:				F - FOG								
								TRACE OR MORE				GL - GLAZE								
								0.25 OR MORE				K - SMOKE								
								1				SD - BLOWING DUST								
								0.50 OR MORE				SS - SLOWING SNOW								
								0.75 OR MORE				DL - DISTANT LIGHTNING								
								1.00 OR MORE				DS - DRIFTING SNOW								
								2				IC - ICE CRYSTALS								
								3				T - THUNDERSTORM								
								4												
								5												
								6												
								7												
								8												
								9												
								10												
								11												
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								18												
								19												
								20												
								21												
								22												
								23												

25 MILES N. W. OF RICHLAND, WASHINGTON  
LATITUDE 46° 34' N., LONGITUDE 119° 36' W., ELEVATION (GROUND) 733 FEET

10 M = 100 = 22 (1-73) x 100 PL. HCN LARD. NISM



# CLIMATOLOGICAL DATA

## HANFORD METEOROLOGY STATION

February 1980

25 MILES N. W. OF RICHLAND, WASHINGTON

LATITUDE 46° 04' N., LONGITUDE 119° 26' W., ELEVATION 990-1033 FEET

TEMPERATURE (30 FT. LEVEL)							PRECIP		WIND (30 FT. LEVEL)					FRONTS AND WED. PHENOMENA				
DATE	MAXIMUM	PRECIPITATION	WIND	WIND DIRECTION	WIND SPEED (MPH)	WIND GUST (MPH)	DEGREE DAYS		TOTAL INTN. EQUIVALENT IN IN.	SNOW	ICE PELLETS	SLEET	WIND DIRECTION	WIND SPEED (MPH)	WIND GUST (MPH)	AVERAGE REL. HUM.	SOLAR (HOURS)	SKY COVER (ESTIMATED ANGULAR NUMBER TO SUN IN %)
							HEATING	COOLING										
1	2	0					6A	5B	7	8	9	10	11	12	13	14	15	16
1	37	0					40	0	0.07	T	0.3	NW	2.2	10	NW	76	123	10
2	37	0					37	0	0.12		0.3	NW	1.2	15	WNW	85	42	10
3	37	0					37	0			0.3	N	12	NW	98	80	10	
4	37	0					35	0			0.3	NW	0.3	24	NW	92	239	5
5	37	0					31	0	T	T	0.1	NW	0.1	21	WNW	81	76	10
6	37	0					30	0	0.01		0.1	NW	1.0	12	N	92	125	9
7	37	0					33	0			0.1	NW	1.0	16	NW	90	130	7
8	37	0					31	0			0.1	NW	0.9	18	NW	84	43	10
9	37	0					29	0			0.1	NW	0.7	13	WNW	80	46	10
10	37	0					29	0			0.1	NW	0.8	11	NW	78	49	10
11	37	0					31	0			0.1	W	1.3	12	NW	76	49	10
12	37	0					33	0			0.1	W	2.3	9	WSW	77	38	10
13	37	0					37	0	0.17	3.2	T	NW	6.8	24	NE	88	50	10
14	37	0					45	0	0.03	0.8	3.0	N	11.9	28	NNE	83	131	10
15	37	0					41	0	0.02	0.5	0.8	NW	1.2	13	NW	83	150	10
16	37	0					35	0	0.01		0.8	NW	1.8	14	NW	79	128	10
17	37	0					33	0	0.28		3.0	NW	2.5	9	WNW	93	109	10
18	37	0					31	0	0.01		0.3	NE	1.5	12	SSE	94	107	10
19	37	0					27	0	0.07		0.3	NW	2.2	24	NW	88	176	10
20	37	0					22	0	0.01		0.1	W	1.1	28	SW	75	236	9
21	37	0					28	0			0.1	NW	1.0	17	NW	71	241	9
22	37	0					33	0			0.1	NW	2.2	22	NW	77	121	9
23	37	0					27	0			0.1	NW	1.0	17	WNW	74	258	5
24	37	0					25	0			0.1	NW	12.0	20	NW	68	178	10
25	37	0					22	0	0.02		0.1	NW	6.2	16	WNW	73	179	10
26	37	0					25	0	0.20		0.1	NW	3.8	10	NW	93	62	10
27	37	0					23	0	0.24		0.1	NW	6.0	24	WNW	93	73	10
28	37	0					17	0	0.04		0.1	W	3.8	31	W	79	200	9
29	37	0					21	0			0.1	NW	3.1	15	WNW	73	283	8
30																		
31																		
SUM							586	0	1.30	4.5								
AVE	39.2															9.3		

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MAR 1 1980

L.A. ESPING

NOTES				PRECIPITATION (IN)				MISC. PHENOMENA NOTATIONS USED IN COL. 17			
(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.				TOTAL FOR THE MONTH				A - HAIL			
(2) HAIL IN COLUMNS 1-4 INDICATES A TRACE.				DEPARTURE FROM NORMAL				AU - ALGAE			
(3) THE WINDSPEED (MPH) IS THE UNIT USED TO REPORT ONE DIRECTIONAL SPEED / CM 2				GREATEST IN 24 HRS				D - DUST			
				NUMBER OF DAYS WITH				F - FOG			
TEMPERATURE (30 FT. LEVEL)				T 1. OR MORE				GL - GLAZE			
AVERAGE FOR THE MONTH				T 1. OR MORE				H - HAIL			
DEPARTURE FROM NORMAL				T 1. OR MORE				SD - BLOWING DUST			
HIGHEST				T 1. OR MORE				SS - RAINING SNOW			
LOWEST				T 1. OR MORE				DL - DISTANT LIGHTNING			
NUMBER OF DAYS WITH				T 1. OR MORE				DS - DRIZZLING SNOW			
MAX 22 OR BELOW				T 1. OR MORE				IC - ICE CRYSTALS			
MAX 20 OR ABOVE				T 1. OR MORE				T - THUNDERSTORM			
MIN 20 OR BELOW				T 1. OR MORE				BAROMETRIC PRESSURE (IN.)			
MIN 10 OR BELOW				T 1. OR MORE				AVERAGE STATION			
HEATING DEGREE DAYS (BASE 65°F)				T 1. OR MORE				HIGHEST SEA LEVEL			
TOTAL FOR THE MONTH				T 1. OR MORE				LOWEST SEA LEVEL			
DEPARTURE FROM NORMAL				T 1. OR MORE				SOLAR RADIATION (HOURS)			
SEASONAL TOTAL (JAN-JULY)				T 1. OR MORE				AVERAGE DAILY TOTAL			
SEASONAL DEPARTURE FROM NORMAL				T 1. OR MORE				GREATEST DAILY			
				T 1. OR MORE				LEAST DAILY			
				T 1. OR MORE				MISCELLANEOUS NUMBER OF DAYS			
				T 1. OR MORE				CLEAR			
				T 1. OR MORE				PARTLY CLOUDY			
				T 1. OR MORE				CLOUDY			
				T 1. OR MORE				REL. HUM. EXTREMES (%)			
				T 1. OR MORE				HIGHEST			
				T 1. OR MORE				LOWEST			

# Battelle CLIMATOLOGICAL DATA

## HANFORD METEOROL Y STATION

MONTH

25 MILES N. W. OF RICHLAND, WASHINGTON

January 1960

LATITUDE 46° 34' N., LONGITUDE 119° 35' W., ELEVATION (GROUND) 733 FEET

DATE	TEMPERATURE (°F, 3 FT. LEVEL)						PRECIP			WIND (50 FT. LEVEL)						FRONTS AND MISC. PHENOMENA	
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	DEGREE DAYS		TOTAL (WTR. EQUIVALENT IN IN.)	SHOW. ICE PELLETS (IN IN.)	SHOW. ICE IN LETS (IN IN.)	PREVAILING DIRECTION	AVERAGE SPEED (MPH)	PEAK GUST		AVERAGE REL HUM %	SOLAR (LANGLEY'S)	REL HUM % FROM NUMBER TO DUNLEY	NOTE:
					BASE 65	HEATING						SPEED (MPH)	DIRECTION				
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17
1	31	31	34	+4	31	0	0.11			S	1.2	7	E	97	43	10	F
2	31	31	34	+4	31	0				SW	2.7	16	W	94	34	10	F KFR 1530
3	31	24	30	+1	35	0				N	4.6	14	SSW	88	101	10	
4	31	30	32	+3	33	0	0.09			NW	4.8	14	NW	91	29	10	F
5	31	28	28	-1	37	0				N	3.8	21	NNE	85	104	6	F KFR 1905
6	31	19	18	-11	47	0				W	4.9	13	WNW	81	100	7	
7	31	8	14	-15	51	0	0.05	0.3		NW	4.0	13	NW	88	88	10	F
8	31	16	19	-10	46	0	0.22	2.9	1.3	NW	7.0	13	NNE	81	50	10	F
9	31	13	16	-13	49	0	0.20	2.8	4.9	NW	6.3	13	NW	88	95	10	F
10	31	-3	7	-22	58	0				N	4.6	12	WNW	80	172	0	F
11	31	6	16	-12	49	0	0.17	1.3	5.1	NW	8.3	19	WNW	85	70	10	F GL
12	31	21	36	+8	29	0	0.01		6.4	SW	16.5	56	SW	75	95	8	F GL KFR 0710
13	31	22	34	+6	31	0	0.33	0.4		NW	4.1	23	NW	91	58	9	F GL
14	31	27	34	+6	31	0	0.06			NW	5.2	22	NW	88	50	9	F
15	31	25	30	+2	35	0				NW	5.4	13	WNW	90	122	8	
16	31	29	33	+5	32	0	0.05			NW	3.4	12	NW	91	55	10	F KFR 1800
17	31	24	34	+6	31	0				NW	7.0	23	N	79	148	3	F
18	31	24	30	+1	35	0				N	12.6	27	NNE	48	132	5	
19	31	19	26	-3	39	0				NW	7.2	15	NW	89	173	4	
20	31	13	22	-7	43	0				NW	2.9	12	NW	73	113	10	
21	31	19	28	-1	37	0				NW	4.2	12	NNW	71	173	8	
22	31	15	24	-6	41	0				NW	3.3	10	NW	83	173	4	
23	31	24	26	-4	39	0				NW	2.5	10	WNW	84	30	10	F
24	31	16	22	-8	43	0				NW	5.9	16	NW	90	39	10	F
25	31	19	26	-4	39	0				N	8.9	31	NE	66	89	10	
26	31	13	18	-13	47	0				N	17.4	31	NNE	41	136	5	
27	31	2	11	-20	54	0				N	8.9	21	NNE	48	205	0	
28	31	4	12	-19	53	0				NW	8.8	16	NNW	58	199	0	
29	31	3	12	-19	53	0				NW	5.7	13	NW	56	207	0	
30	31	2	12	-20	53	0				NW	9.3	22	NW	55	190	7	
31	31	14	20	-12	45	0	0.03	0.3		NW	5.8	14	NW	59	71	10	
SUM (1277) 1.32 8.7																	L.A. BISPING
AVG 22.17.1 6.4 7.2																	

NOTES				PRECIPITATION (IN)				MISC PHENOMENA NOTATION USED IN COL. 17													
(1) UNLESS OTHERWISE SPECIFIED, THE DAILY SUMMARY PERIOD IS FROM MIDNIGHT TO MIDNIGHT, PACIFIC STANDARD TIME.				TOTAL FOR THE MONTH				1.32		A - HAIL		SD - BLOWING DUST									
(2) WITHIN COLUMNS 7 - 9 DENOTES A TRACE.				DEPARTURE FROM NORMAL				+0.35		AL - AURORA		SS - BLOWING SNOW									
(3) THE LANGLEY (COL. 15) IS THE UNIT USED TO DENOTE ONE GRAM CALORIE / CM 2				GREATEST IN 24 HRS				0.33 ON 13+		D - DUST		DL - DISTANT LIGHTNING									
				NUMBER OF DAYS WITH:						F - FOG		DS - DRIFTING SNOW									
				TRACE OR MORE				15		0.25 OR MORE		1		IC - ICE CRYSTALS							
TEMPERATURE (°F; 3 FT. LEVEL)														T - THUNDERSTORM							
AVERAGE FOR THE MONTH				23.7				0.01 OR MORE		11		0.50 OR MORE		2		BAROMETRIC PRESSURE (IN.)					
DEPARTURE FROM NORMAL				-5.7				0.10 OR MORE		5		1.00 OR MORE		0		AVERAGE STATION					
HIGHEST				51 ON 12				SNOW, ICE PELLETS (SLEET) (INCHES)						HIGHEST SEA LEVEL		29.74 ON 12					
LOWEST				-3 ON 10				TOTAL FOR THE MONTH				8.7		SOLAR RADIATION (LANGLEY)							
NUMBER OF DAYS WITH:								GREATEST IN 24 HOURS:				4.2 ON 8-9		AVERAGE DAILY TOTAL							
WIND 30 OR BELOW				16				GREATEST ON GND:				6.4 ON 12+		GREATEST DAILY							
WIND 30 OR ABOVE				0				WIND (50 FT. LEVEL)						LEAST DAILY							
WIND 20 OR BELOW				31				AVERAGE SPEED (MPH)				6.4		WISCELLANEOUS NUMBER OF DAYS							
WIND 10 OR BELOW				1				DEPARTURE FROM NORMAL				0.1		CLEAR							
-EXTING DEGREE DAYS (BASE 50°)								PEAK GUST				16 FROM 15N ON 12		PARTLY CLOUDY							
TOTAL FOR THE MONTH				1277				AVERAGE PSYCHROMETRIC DATA						CLOUDY							
DEPARTURE FROM NORMAL				+103				DRY BULB (°F)				23.7		WET BULB (°F)		18		REL HUM. EXTREMES (%)			
SEASONAL TOTAL (SINCE JULY 1)				2313				REL. HUM. (N)				75		DEW PT (°F)		17		HIGHEST			
SEASONAL DEPARTURE FROM NORMAL				+506				-INDOTES LATEST OF SEVERAL DATES						LOWEST				19 ON 0			

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JAN 30 1980

L. A. BISPING

DAWSON WEATHERING STATION, 25 MILES S.W. OF RICHLAND, WA.  
Latitude 46° 04' N. Longitude 123° 30' W. Elevation 733 Feet

RAVENS - PACIFIC NORTHWEST  
JANUARY - RICHLAND, WA.

INTERNATIONAL STANDARD  
FORM - 1879

Temperatures (°F)										Degree Days			Precipitation (Inches)					Relative Humidity (%)				
Averages					Extremes					Date (YY)			Total	Departure	Maximum In 24 Hours	Date and Relative Humidity		Average	Departure			
Month	High	Low	Mean	Range	High	Low	Mean	Range	Start	End	Departure	High				Low	Mean			Start	End	High
1	41.8	28.8	34.2	+13.0	37	21	-11	48	1382	-488	0	0	0.54	-0.42	0.31	10-11	11.1	+5.1	5.3	13	54	+8
2	40.8	28.8	34.2	+12.0	62	26	-12	74	892	-407	0	0	0.17	-0.41	0.08	12	1.5	+1.2	3.2	23	76	+6
3	39.3	25.1	32.2	+14.2	76	24	20	52	571	-171	0	0	0.54	-0.16	0.42	27	1.1	+2.4	3.5	3	56	+5
4	46.4	30.8	38.6	+15.6	83	29	29	54	749	-123	1	0	0.32	+0.28	0.25	18-19	1.3	+0.1	1.1	4	31	+5
5	50.8	35.4	43.1	+15.4	94	22	38	72	94	-39	65	+16	0.10	-0.42	0.08	1	1	0	0	4	40	+3
6	56.4	38.2	47.3	+18.2	100	28	45	72	21	+13	197	+5	7	-0.70	7	17	1	0	0	1	11	+5
7	61.7	40.8	51.2	+20.9	110	20	39	90	10	+10	294	+10	0.08	-0.08	0.06	10-11	1	0	0	4	36	+2
8	70.8	38.8	54.8	+32.0	121	19	50	102	0	-6	299	-39	0.38	+0.17	0.11	30	1	0	0	4	45	+5
9	64.0	32.7	48.2	+31.3	96	15	47	81	17	-57	128	+71	0.20	+2.10	0.14	2-3	1	0	0	4	42	+1
10	59.1	25.7	42.5	+33.4	84	74	30	32	146	-127	5	+3	0.47	+0.34	0.40	18-19	1	0	0	4	30	+3
11	45.7	27.7	34.2	+18.0	59	6	13	25	104	-171	5	0	1.36	+0.56	0.42	19	1.5	+4.0	5.4	14	59	+10
12	40.8	28.8	34.2	+12.0	59	9	19	11	877	-174	0	0	0.99	+0.18	0.32	19-24	7.1	+0.1	3.6	25-26	40	+3
13	44.8	27.1	35.9	+17.7	110	20	-10	130	1104	-101	1099	+6	3.56	-0.32	0.42	Nov 26+	14.3	+11.2	5.0	13	37	+3

Mean 24 Hourly Average		Solar Radiation (Langhairs)					2" Force Wind					Amount of Cloud							
Month	Average	Precipitation	Average Daily Total	Departure	Maximum Daily Total	Date	Average Speed (MPH)	Direction	Date	Thunderstorms	Heavy Fog	Precipitation 0.01 to 0.06	Sum of all 0.1 inch	0.50 inch	0.75 inch	Max. Temp. (°F)	Min. Temp. (°F)	Rel. Hum. (%)	Wind Sp. (MPH)
1	3.6	+0.1	113	-1	214	28	6.7	SW	21	0	14	3	1	0	0	30	27	6	6
2	3.3	0	180	+45	290	28	4.1	SW	11	0	4	0	0	0	4	31	14	14	14
3	3.1	+0.1	124	-16	487	31	4.4	SW	7	0	0	1	0	0	0	31	9	9	9
4	7.3	+0.2	424	-16	592	26	1.7	SW	13	3	0	2	0	0	0	31	9	9	9
5	6.5	+0.2	568	+3	696	31	2.54	SW	22	2	0	0	0	0	0	31	9	9	9
6	4.7	+0.4	490	+24	716	13	1.77	SW	18	1	0	0	0	0	0	31	9	9	9
7	5.8	+0.1	437	-22	716	3	2.13	SW	9	3	0	0	0	0	0	31	9	9	9
8	4.2	+0.2	724	-27	891	2	1.49	SW	4	0	0	1	0	0	0	31	9	9	9
9	7.8	+0.1	411	-7	494	5	2.51	SW	15	0	0	1	0	0	0	31	9	9	9
10	5.7	+0.1	232	-30	380	3	3.9	SW	25	0	1	3	0	0	0	31	9	9	9
11	6.7	+0.1	84	-27	149	10	1.7	SW	14	0	3	0	0	0	0	31	9	9	9
12	6.1	+0.1	169	-21	729	24	1.5	SW	19	19	38	17	0	0	0	31	9	9	9

REMARKS: 1. Also on earlier dates. 2. Sunrise to Sunset. 3. Calm or light breeze. 4. Visibility 1/4 mile or less.

# HANFORD METEOROLOGY STATION

## CLIMATOLOGICAL SUMMARY FOR THE YEAR 1979

Nineteen hundred seventy-nine was a year of contrast. January was for the 4th coldest since records began in 1913 with an average temperature of 14.0°F (18.4°F below normal), while a string of 30 consecutive days (July 15 to August 13) occurred with maximums of 90°F or above. November was cold, wet and foggy - the temperature averaged 34.2°F (6.0°F below normal), with the last 11 days averaging 10°F below normal; 1.36 inches of rainfall were recorded (70% above normal); and fog was recorded on 17 days. The temperature extremes for 1979 were from -12°F on February 3 to 110°F on July 20.

The following daily extreme temperature records were broken in 1979 (°F):

	Maximum		Minimum	
	Highest	Lowest	Highest	Lowest
Jan 1				-11 (3, 1942-)
Jan 7		9 (13, 1937)		
June 10			68 (65, 1955)	
July 2				39 (42, 1961)
July 19			77 (76, 1960)	
Sept 16			65 (63, 1967)	
Sept 18			61 (60, 1962)	
Sept 26			61 (60, 1952+)	
Nov 29				13 (15, 1951+)
Dec 14			48 (45, 1917)	

(Previous record and date of occurrence)

Precipitation for 1979 totaled 5.56 inches which was 14% below normal. May, June and July rainfall totaled only 0.19 inches which was only 14% of normal (1.36 inches) for that period.

There were three major dust storms during 1979, the worst of which occurred on July 4 when visibility was reduced to less than 1/4 mile and winds gusted to 69 mph. The other two storms on May 25 and June 18 reduced visibility to near 5 miles with wind gusts of 39 mph and 46 mph respectively.



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APR 11 1979

L. A. BISPING

SAINTS METEOROLOGY STATION, 25 MILES N.W. OF WHEELAB, AK  
 Latitude 61° 34' N, Longitude 119° 36' W, Elevation 1700 feet

STATION - SAINTS METEOROLOGY  
 STATION - WHEELAB, AK

CLIMATOLOGICAL SUMMARY  
 YEAR - 1978

Month	Temperatures (°F)			Degree Days			Precipitation (Inches)			Relative Humidity (%)		
	Extremes			Base 65 (°F)			Snow (Ice Pellets)					
	Monthly	Maximum	Minimum	Heating	Cooling	Departure	Total	Maximum	Days	Average	Departure	
1	35.1	44.1	26.6	1001	-93	0	1.11	0.00	14-14	2.9	87	-11
2	45.3	51.1	37.9	741	-17	0	0.82	0.00	15-26	0.8	82	-12
3	59.0	64.1	50.4	590	-92	0	0.20	0.00	20	0	61	+5
4	63.8	69.0	58.6	393	+12	0	0.48	0.00	27	0	53	+6
5	71.4	76.4	66.6	203	+50	5	0.41	0.00	24-25	0	49	+1
6	78.0	84.1	72.1	12	-12	182	0.00	0.00	24	0	43	+3
7	81.1	87.1	75.1	2	-2	332	0.52	0.00	3	0	38	+6
8	87.4	93.0	81.0	10	+5	248	0.57	0.00	24	0	42	+7
9	78.7	84.1	70.8	78	+9	41	0.21	0.00	8-8	0	52	+11
10	67.6	73.0	62.4	180	+17	-2	0	0	28	0	52	+6
11	41.4	47.1	35.8	361	-235	0	1.11	0.00	18-19	10.1	72	+1
12	35.9	41.1	27.3	1162	-171	0	0.00	0.00	4	1.4	75	+5
Y	63.7	69.0	50.6	5330	+383	808	6.17	0.00	18-19	13.3	59	+5

Month	Mean Sea Level			Solar Radiation (Cal/cm/Min)			50 Foot Wind			Number of Days		
	Station						Peak Gusts			Max Temp. (°F)		
	Average	Maximum	Minimum	Average	Maximum	Minimum	Speed (MPH)	Direction	Rate	90°	12°	Min. Temp. (°F)
1	9.1	14.1	3.0	150	21	10	37	SW	0	0	6	22
2	8.5	14.1	2.9	157	20	10	32	SW	0	0	2	17
3	7.8	14.1	2.9	452	24	10	36	SW	1	0	0	21
4	7.9	14.1	2.9	593	29	10	64	SW	1	0	0	4
5	6.2	14.1	2.9	693	34	10	40	SW	1	0	0	0
6	4.1	14.1	2.9	728	38	10	49	SW	0	12	0	0
7	3.8	14.1	2.9	711	41	10	43	SW	0	17	0	0
8	2.9	14.1	2.9	653	38	10	34	SW	0	11	0	0
9	6.7	14.1	2.9	127	3	10	39	SW	0	0	0	2
10	5.1	14.1	2.9	380	1	10	34	SW	0	0	0	0
11	7.3	14.1	2.9	237	4	10	52	SW	4	0	7	0
12	4.4	14.1	2.9	158	4	10	58	W	1	0	11	0
Y	6.6	14.1	2.9	7.4	7.4	7.4	44	SW	22	42	26	118

STATION - SAINTS METEOROLOGY - also on earlier dates: Sunrise to Sunset, Calories/Sq. Cm., Wind, etc. 100 miles or less.

HANFORD METEOROLOGICAL STATION  
CLIMATOLOGICAL SUMMARY FOR THE YEAR 1978

Temperatures during 1978 averaged 1.3°F below normal. January and March were significantly above normal while May, September, November and December were well below normal. The following daily extreme temperature (°F) records were broken during 1978:

	Highest Max.	Lowest Max.	Highest Min.	Lowest Min.
Jan. 2				-9 [-1, 1916]
June 5	101 [98, 1969+]			
July 14		77 [78, 1957]		
Oct 14				21 [21, 1919]
Nov 3	69 [65, 1921]			
Nov 11				14 [15, 1955+]
Dec 31				-9 [-1, 1913+]

[Previous record and date of occurrence]

Precipitation for 1978 totaled 6.57 inches which is 1% above normal. January, February and November accounted for 59% of the total precipitation for the year while June, September and October accounted for only 3%. Normally January, February and November would have 36% of the total and June, September and October, 15% of the annual precipitation. On November 18 and 19, 1978 a record 24-hour snowfall occurred. During the 2-day storm, 9.1 inches of snow was recorded and 8.3 inches of this total was recorded in a 24-hour period. The previous 24-hour snowfall record was 7.1 inches set in January 1954. (Period of record 1946-74).

There were three major dust storms during 1978. On April 19, peak wind gusts reached 64 mph and visibility was reduced to one-half mile because of blowing dust. Visibility on November 3 and 4 was down to less than 4 miles when wind gusts reached 48 mph and 52 mph respectively. Again on December 22 visibility was down to 4 miles with peak gusts to 51 mph.

## 1. Proposed Single Stage HEPA Filtration

### 2.1 Comment

*What is the history of particulate accumulation on the two-stage HEPA filters for which a single stage is proposed?*

#### Response

Exxon Nuclear is proposing at this time to eliminate the primary (first stage) HEPA filters from the HVAC system exhausting room air from the fuel rod loading/welding room of the  $UO_2$  fuel fabrication plant. The fuel rod loading and down-loading operations, as well as the fuel rod end-cap welding operations, are performed within enclosures within this room. The enclosures for these operations are currently exhausted through primary and final stages of HEPA filters, and this practice will be continued. However, it is proposed to eliminate the primary HEPA filters, which have shown no radioactive particulate accumulation over the years of operation, from the exhaust ducts handling only room air.

Also, Exxon Nuclear proposes to install single stage HEPA filtration systems in exhaust air systems for the  $UF_6$ - $UO_2$  conversion liquid waste quarantine tank gallery and the  $UO_2$  powder storage room, which have not been HEPA-filtered in-date. The tank gallery was originally located outside (now enclosed), and the  $UO_2$  powder storage room had not been provided with an exhaust air system since only sealed containers are allowed in that room.

### 2.2 Comment

*What problems has Exxon encountered with the operation and maintenance of HEPA filters in the past?*

#### Response

The only problems that Exxon Nuclear has encountered with the operation and maintenance of HEPA filters have been related to the carryover of moisture from liquid scrubbers in the process offgas exhaust air systems for chemical operations. In such systems, the primary HEPA filters frequently become saturated with moisture causing a rapid increase in the  $\Delta P$  and requiring that the respective HEPA filters be replaced.

Exxon Nuclear intends to continue to employ two-stage HEPA filtration arrangements in all such systems.

1.1 Comment

*Can single stage filtration be shown to be sufficient considering the possible need of back-up filtration in the event of equipment failure or problems with routine maintenance and operation?*

Response

Exxon Nuclear will evaluate the number of stages of HEPA filtration to be installed in each system on a case-by-case basis, and single-stage HEPA filtration will be used only in exhaust air systems where the potential for contamination of exhaust air is low, where the filter life expectancy is long, and where there is no need for back-up filtration (e.g., in the event of equipment failure or problems with routine maintenance and operation).

1.4 Comment

*Will the physical locations of the HEPA filters (regardless of the number of stages) be altered or increased in number?*

Response

As mentioned in the response to Comment number 2.1, Exxon Nuclear intends to remove the primary HEPA filters from the HVAC system exhausting room air from the fuel rod loading/welding room of the UO<sub>2</sub> fuel fabrication plant. However, the exhaust air "pick-up" points will not be altered.

The number of HEPA filter locations will be increased by the addition of the two exhaust air systems mentioned in the response to comment number 2.1. Also, when Exxon Nuclear has completed deposition of the plutonium inventory and as uranium operations are expanded in the MO&SF plant, changes in the number of stages of HEPA filtration employed, as well as their physical locations, will be made.

1.5 Comment

*Would this change be accompanied by a change in the method of monitoring the stack exhaust?*

Response

No.

1.2 Comment

*Are there reasons, other than economical, for the proposed change?*

Response

It should be recognized that concurrent with the economics involved in employing single stage HEPA filtration where practicable, conservation of materials and energy will be realized.

8. See UO<sub>2</sub> Facility

(It is assumed that this section refers to the UO<sub>2</sub>-UC Conversion Facility Expansion which was the subject of Exxon Nuclear's Supplemental Environmental Report, Document No. CN-14, Add. 4, August 1977.)

3.1 Comment

*Has the impact of this facility on waste handling deviated from that predicted at the time of its licensing?*

Response

The impact of the operation of the expanded UO<sub>2</sub> fuel fabrication plant on waste handling at the site has been as predicted at the time of its licensing. Exxon Nuclear continues to handle its wastes as described in its documents submitted to the NRC for license amendments.

3.2 Comment

*Has this facility altered the storage requirements of hazardous materials?*

Response

See response to comment number 3.3, below.

3.3 Comment

*Have the locations of storage areas of hazardous materials been changed or increased since the licensing of this facility?*

Response

Since the licensing of this facility, the following storage areas/facilities for hazardous materials have been added or expanded:

- a) Added fourth evaporation lagoon for process liquid wastes south of Lagoon number 3;
- b) Increased the size of storage pad south of the UO<sub>2</sub> fuel fabrication building for packaged, recoverable solid low-level radioactive waste.
- c) Added 10,000 gallon storage capacity for H<sub>2</sub>O<sub>2</sub>;
- d) Added 2,000 gallon storage capacity for anhydrous ammonia; and



- e) Relocated the Packaged Radioactive Materials Storage Building from its original location next to the warehouse to a new location adjacent to the evaporation lagoons (west side).

3.4 Comment

*Have the shipment requirements of resources or waste materials deviated from those predicted for the addition of this facility?*

Response

No, except for low-level solid radioactive wastes. For these wastes, shipment delays have been encountered because of problems involved with licensed low-level radioactive waste sites.

3.5 Comment

*Have any of the factors which affect the probability and/or magnitude of the maximum possible release deviated in practice from those predicted?*

Response

No.

3.6 Comment

*Has the personnel requirement of this facility changed since its initial operation?*

Response

Yes. There has been a slight increase (~10%) in the operating personnel requirements for the operations involved over that required during initial operations as experience dictated the need for additional manual coverage.

However, the operating personnel requirements will increase further (~50% over the current level) when the second conversion line is installed within the existing facility.