Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

TO: Power Plant Siting Review Committee

FROM: Buck Oven BO

DATE: January 14, 1993

SUBJECT: Florida Power Polk County Site - PA 92-33
Module 8043

Attached please find an Addendum to FPC's PPSA application.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Patty Adams

FROM: H

SUBJECT: FPC Polk Co. PA 92-33

DATE: 1-19-93

4 copies

RECEIVED

JAN 20 1993

Division of Air
Resources Management

Florida Power
CORPORATION

January 8, 1993

Mr. Hamilton S. Oven
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Oven:

Re: Polk County Site
Site Certification Application Addendum (PA 92-33)

Enclosed is an Addendum to Florida Power Corporation's (FPC) Site Certification Application (SCA) for a new power plant complex at the Polk County Site. The Addendum represents the final eight months of air quality data collected at the site. The material should be inserted in Volume 6, behind the existing material contained in Section 10.5.6.2.

Should there be any questions regarding this Addendum or any aspect of the application, please call me at (813) 866-5529.

Very truly yours,

Kathy Small

Kathleen L. Small
Environmental Project Manager

Enclosure

cc: All Parties

pag\KLS\1993\Oven.Let

10.5.6.2 Summary of On-Site Hourly Surface Meteorological Monitoring Data (2/15/92 - 10/14/92)

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 02/ 15 /92
TO: 02/ 29 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
15	142	163	185	180	153	120	136	131	150	177	182	184	191	203	219	220	240	250	256	226	189	202	230	235	24
16	227	207	204	208	215	193	206	195	173	196	189	203	225	240	282	278	288	333	316	323	91	154	64	153	24
17	288	20	124	155	194	162	149	113	137	162	184	186	191	200	213	221	227	234	260	306	340	2	169	172	24
18	175	186	184	200	248	206	115	85	124	203	214	179	195	193	194	224	204	219	241	254	243	219	219	213	24
19	212	218	206	227	209	207	212	221	239	230	225	223	232	254	282	280	279	303	328	329	37	37	315	143	24
20	281	308	307	320	334	354	7	8	17	28	32	32	37	40	42	61	58	55	69	57	58	49	47	38	24
21	38	34	34	41	34	24	31	34	37	53	63	68	72	75	63	60	56	59	61	58	57	58	55	61	24
22	67	38	53	45	45	38	42	61	79	92	92	116	92	91	102	62	56	48	73	71	91	72	138	121	24
23	110	139	172	150	134	148	144	150	163	168	178	183	197	205	221	233	232	237	258	260	266	262	238	129	24
24	136	119	126	211	140	151	141	130	139	140	125	156	148	113	90	68	353	87	262	300	346	265	20	63	24
25	77	114	164	109	93	64	80	110	136	140	156	165	176	185	203	224	248	221	189	199	206	254	259	207	24
26	200	195	204	206	214	213	221	225	264	259	266	266	262	262	267	268	272	274	275	273	272	272	279	277	24
27	281	285	285	290	294	290	293	295	289	289	284	292	286	269	267	268	273	287	295	297	289	279	260	264	24
28	261	276	296	305	297	309	304	315	333	330	299	293	282	273	261	265	267	264	262	264	259	246	255	251	24
29	259	252	256	259	238	236	224	219	245	288	284	293	291	297	290	287	285	285	286	264	272	292	284	241	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 360
% DATA RECOVERY: 100.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 03/ 1 /92
TO: 03/ 31 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	237	237	276	296	287	336	58	76	352	346	11	86	111	139	112	79	293	350	352	4	76	342	302	322	24
2	350	12	322	345	347	339	350	19	34	41	58	71	91	114	73	74	29	49	17	56	82	54	339	23	24
3	39	40	35	39	50	58	62	58	47	163	105	107	87	103	100	92	92	100	100	98	96	104	93	82	24
4	75	71	63	61	68	66	62	38	19	65	99	122	135	128	129	144	159	169	136	78	133	69	65	111	24
5	87	65	79	73	80	73	91	107	110	108	112	114	109	100	119	108	98	101	96	90	96	98	91	95	24
6	93	89	91	85	99	85	83	91	116	135	149	157	169	191	200	213	281	241	251	260	267	252	225	142	24
7	91	107	149	178	199	206	214	215	204	201	228	239	245	267	277	279	268	272	268	259	253	266	276	294	24
8	291	298	296	303	311	325	341	303	298	287	299	325	358	314	329	263	289	212	64	295	296	317	288	297	24
9	330	342	17	22	35	37	35	58	67	119	134	140	143	133	143	135	115	91	213	311	104	116	122	121	24
10	128	155	166	165	166	175	172	168	178	188	192	195	206	206	206	206	213	218	214	212	226	312	311	278	24
11	200	216	241	255	263	294	303	310	310	310	321	325	320	298	277	277	281	287	310	297	305	324	322	321	24
12	318	328	350	1	1	24	359	2	15	49	90	128	99	341	332	342	23	202	304	304	303	305	341	324	24
13	228	148	336	309	298	247	257	282	303	310	302	314	295	290	285	288	293	305	308	301	293	287	308	311	24
14	312	313	321	325	340	330	353	1	19	26	28	31	334	287	286	260	272	278	278	275	292	298	298	279	24
15	296	294	296	303	293	287	287	295	290	305	308	301	289	286	285	291	286	274	266	267	275	277	273	264	24
16	265	260	275	292	277	283	350	18	33	29	29	34	27	43	22	25	22	57	66	67	68	69	56	44	24
17	42	43	41	44	59	66	49	61	83	116	136	119	153	114	141	158	183	138	127	145	92	109	125	147	24
18	127	122	136	148	152	156	132	117	142	154	162	166	161	178	193	205	218	231	224	239	239	210	179	142	24
19	171	181	184	198	197	190	192	198	209	223	239	250	259	270	269	261	273	269	269	257	256	262	262	266	24
20	260	262	259	250	252	256	262	267	285	293	286	285	284	286	283	286	285	270	284	296	302	294	297	305	24
21	332	348	351	348	337	351	341	354	20	42	43	48	43	5	61	327	314	291	348	340	311	357	31	354	24
22	343	344	345	29	31	42	29	49	80	104	133	175	184	203	204	216	233	244	279	217	151	157	154	179	24
23	183	181	188	171	171	172	184	195	226	255	269	279	272	276	275	284	283	300	302	298	301	305	301	338	24
24	357	17	22	18	7	9	13	13	20	25	30	33	48	59	55	49	41	50	57	60	51	45	46	55	24
25	62	65	63	65	64	59	61	64	84	102	106	109	101	97	107	103	111	153	152	179	190	245	302	299	24
26	288	356	350	317	303	292	275	263	284	303	307	308	297	289	288	297	289	293	291	293	293	279	284	294	24
27	288	280	284	280	311	2	30	102	226	288	297	317	291	279	272	269	270	274	278	277	283	279	299	302	24
28	317	319	305	302	326	338	5	28	36	45	54	67	54	37	30	338	350	11	10	2	13	48	72	72	24
29	67	63	58	65	55	29	45	60	76	134	207	220	238	236	243	240	263	279	293	329	0	14	42	47	24
30	46	343	274	228	192	185	88	102	151	180	199	209	230	243	243	256	261	265	220	191	176	180	191	198	24
31	217	238	240	253	254	260	265	279	284	288	278	272	268	272	261	261	265	268	266	269	269	297	317	309	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 744
% DATA RECOVERY: 100.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 04/ 1 /92
TO: 04/ 30 /92

DAY	HOUR 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	298	254	262	286	290	279	44	244	277	288	263	281	273	280	268	247	247	266	260	264	263	279	287	258	24
2	262	259	271	270	260	271	257	253	311	357	340	301	999	276	290	287	295	300	314	317	295	308	318	303	23
3	313	324	349	12	9	24	31	19	24	31	39	23	30	8	5	14	325	349	16	235	241	211	297	309	24
4	326	333	348	354	350	354	2	359	353	341	347	305	272	281	278	274	269	271	270	268	260	250	257	250	24
5	239	263	271	289	288	282	284	307	328	339	356	2	29	23	11	30	22	60	62	64	67	62	49	44	24
6	46	47	58	62	51	60	61	81	94	104	94	92	93	999	97	91	95	95	92	85	98	103	104	124	23
7	140	146	123	83	51	64	61	75	108	127	136	147	161	196	999	148	125	129	143	146	126	122	125	136	23
8	163	173	186	216	254	305	313	317	355	999	999	28	50	47	58	56	61	84	82	78	85	78	75	67	22
9	61	63	60	72	80	56	53	51	64	74	83	95	98	99	101	97	92	84	88	84	90	84	84	96	24
10	69	58	68	24	7	21	38	46	85	103	109	120	113	140	150	129	132	94	182	165	60	164	157	149	24
11	106	74	95	74	95	102	112	130	140	144	162	183	195	188	197	119	82	125	144	109	125	141	1	339	24
12	45	1	32	297	93	80	66	37	124	92	76	276	290	285	290	61	38	45	35	10	11	357	105	251	24
13	279	323	335	310	323	347	5	355	3	7	2	37	33	34	32	38	32	29	29	25	27	25	25	28	24
14	26	20	14	8	20	22	19	22	32	50	58	62	54	51	64	63	54	55	57	50	43	47	39	34	24
15	27	21	21	21	19	24	12	36	55	62	83	88	87	80	84	78	82	85	85	88	93	86	74	72	24
16	55	51	54	53	48	44	47	57	84	92	92	85	94	93	89	87	88	98	96	85	80	80	86	68	24
17	63	73	76	73	66	67	49	73	109	114	109	95	88	90	92	110	93	94	89	94	107	107	94	115	24
18	93	85	67	62	61	48	44	82	117	131	127	143	138	159	150	148	148	132	114	97	111	113	109	111	24
19	110	105	117	93	93	94	98	109	119	118	130	126	127	128	132	188	151	166	185	162	165	167	154	84	24
20	123	155	160	177	192	152	134	148	145	154	142	140	135	138	157	159	132	118	171	190	130	178	209	132	24
21	147	138	144	150	147	145	143	144	156	153	215	230	168	117	87	75	117	137	132	130	137	144	184	206	24
22	134	212	82	146	140	123	109	134	159	175	189	211	168	182	121	327	352	298	154	144	132	253	149	101	24
23	98	91	106	108	112	123	133	141	132	125	146	113	110	104	100	103	88	81	26	296	134	74	92	119	24
24	124	84	1	7	353	30	63	112	247	230	291	291	231	84	211	272	296	291	281	271	308	334	311	306	24
25	299	298	306	302	329	303	301	297	305	299	273	280	273	245	258	266	275	277	272	262	262	259	260	261	24
26	263	263	278	306	332	342	349	353	358	359	352	330	316	293	297	299	297	296	296	300	293	295	296	306	24
27	305	308	321	341	347	347	344	342	333	328	309	311	312	307	311	299	299	301	302	304	298	288	280	278	24
28	279	283	292	326	336	336	350	349	338	329	317	301	304	299	307	315	328	323	324	309	309	305	322	333	24
29	337	327	299	306	314	327	342	346	355	5	354	351	344	341	8	7	6	24	33	45	47	54	23	34	24
30	34	14	351	323	24	344	347	342	10	50	290	289	278	281	234	280	319	321	62	283	284	299	331	331	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 715
% DATA RECOVERY: 99.3

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 05/ 1 /92
TO: 05/ 31 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	313	294	287	292	308	314	316	309	312	322	314	315	332	324	344	1	345	278	270	227	109	78	65	32	24
2	220	246	330	7	320	298	329	318	283	283	270	285	292	8	34	7	20	15	46	189	295	352	157	130	24
3	156	166	189	189	221	189	273	341	339	338	314	288	276	277	273	282	275	271	274	270	270	275	271	270	24
4	261	267	270	260	253	270	252	251	275	295	286	288	280	272	259	244	259	276	272	263	264	265	271	8	24
5	275	251	244	229	211	223	231	265	281	274	265	235	259	279	263	228	248	265	258	261	258	254	258	267	24
6	270	270	263	286	280	279	268	268	258	233	219	230	237	250	273	267	270	270	271	276	278	274	315	334	24
7	2	22	22	340	359	340	331	331	316	304	307	264	261	263	280	304	305	304	302	302	300	293	286	332	24
8	347	37	306	285	208	174	198	207	246	286	294	289	285	280	279	277	268	260	262	258	249	241	225	232	24
9	213	302	273	250	174	176	277	349	306	327	249	217	233	245	284	284	248	180	126	283	314	9	6	8	24
10	17	14	29	33	32	34	24	46	50	74	73	84	37	73	60	70	108	104	26	17	102	112	110	31	24
11	302	329	312	19	19	14	25	342	250	237	23	999	25	67	89	79	49	73	86	99	102	112	146	133	23
12	285	281	267	321	32	49	48	61	50	283	198	326	198	73	30	315	54	40	306	321	107	128	129	110	24
13	155	153	166	193	200	236	170	209	232	244	268	241	252	259	263	267	266	260	267	262	245	240	232	239	24
14	233	238	242	261	249	270	239	259	278	281	282	269	277	285	292	284	270	270	266	268	267	286	294	304	24
15	309	297	288	119	147	155	163	156	140	180	190	203	212	227	214	250	264	264	318	61	115	111	122	161	24
16	122	99	53	48	64	86	91	93	98	91	91	86	71	81	100	89	90	80	72	65	67	71	64	68	24
17	62	62	59	57	60	64	56	76	83	82	54	60	99	99	89	84	87	84	78	71	79	59	50	45	24
18	25	33	40	38	26	25	33	53	63	70	71	68	73	999	83	77	67	72	70	68	80	71	66	42	23
19	59	34	26	6	22	20	1	48	69	78	84	84	84	85	88	80	75	82	85	86	83	83	75	72	24
20	55	39	56	35	31	37	40	55	72	70	74	74	58	70	74	68	66	76	79	84	86	63	53	42	24
21	34	31	19	20	18	20	18	28	37	47	52	52	58	51	61	94	85	83	88	77	71	66	53	31	24
22	35	67	25	33	53	68	5	25	48	60	54	58	60	62	69	55	60	64	67	73	63	49	36	22	24
23	26	4	350	2	7	12	26	31	9	35	31	35	33	46	47	4	20	358	49	77	74	74	57	37	24
24	23	10	29	339	303	323	37	30	298	307	307	16	358	357	334	319	303	264	265	274	285	302	26	5	24
25	340	256	262	170	189	201	212	253	290	281	281	253	246	254	267	283	275	269	268	268	267	271	270	287	24
26	263	257	122	137	162	180	198	224	240	259	243	247	250	241	261	268	270	272	273	265	262	260	264	270	24
27	267	268	275	273	289	223	178	185	186	224	257	237	259	238	255	289	289	47	290	340	2	55	42	350	24
28	296	241	235	332	42	267	211	236	265	294	248	242	230	236	226	233	227	226	269	272	278	309	283	356	24
29	112	192	188	187	214	159	97	155	180	185	186	193	192	198	226	219	277	280	274	275	278	25	56	82	24
30	104	110	119	98	166	166	174	191	212	212	202	190	223	271	283	169	107	122	85	71	42	74	106	146	24
31	182	209	164	347	39	1	356	346	312	298	50	103	114	65	96	89	37	5	63	295	320	45	319	340	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 742
% DATA RECOVERY: 99.7

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 06/ 1 /92
TO: 06/ 30 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	349	34	15	13	17	360	23	14	9	278	304	257	289	271	285	298	318	315	312	285	328	306	216	275	24
2	302	315	331	324	10	39	96	57	144	197	226	99	110	51	274	163	189	112	138	101	134	104	94	78	24
3	138	163	179	190	151	132	117	126	137	136	134	140	156	156	140	108	127	132	148	178	170	163	173	176	24
4	169	178	174	180	204	215	221	241	243	246	249	263	273	279	280	270	264	265	264	262	255	218	211	214	24
5	211	218	214	217	215	218	216	226	224	222	235	256	243	259	269	265	265	263	257	246	247	228	203	207	24
6	212	226	231	248	261	239	130	128	181	199	232	265	234	174	176	275	64	341	93	91	135	171	177	169	24
7	119	104	152	146	122	134	136	167	204	198	155	173	186	153	126	130	138	207	258	304	124	136	58	56	24
8	999	113	163	132	124	140	90	63	89	134	167	163	162	153	118	87	86	98	201	224	48	133	268	100	23
9	109	96	112	135	107	146	181	159	162	183	198	187	189	222	204	213	267	279	275	256	183	234	116	154	24
10	154	183	203	205	220	244	241	232	262	274	272	279	267	262	271	280	281	294	314	317	325	317	309	302	24
11	297	247	283	143	322	311	296	303	297	285	289	292	281	290	281	287	281	287	293	296	287	295	317	306	24
12	333	81	212	240	267	273	288	290	276	283	277	268	280	278	276	287	299	298	278	263	109	145	170	185	24
13	179	193	195	201	198	203	179	209	235	238	246	237	247	267	284	278	286	67	115	85	107	108	112	162	24
14	186	189	191	207	199	173	194	208	225	248	246	252	265	253	273	274	276	290	316	302	355	29	147	177	24
15	164	189	178	145	183	194	186	207	221	224	229	237	237	232	277	265	249	245	132	110	118	151	190	202	24
16	200	185	195	210	300	200	60	240	340	360	10	999	999	999	999	999	999	999	999	999	999	999	999	999	11
17	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
18	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
19	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
20	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
21	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
22	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0
23	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	242	212	191	163	171	190	206	192	8
24	127	132	180	186	203	210	159	183	207	207	185	183	210	225	225	222	202	216	235	237	206	190	99	103	24
25	129	92	112	113	112	120	134	127	999	999	999	133	135	189	172	177	173	179	181	198	162	162	189	186	21
26	189	173	159	157	166	218	225	219	221	225	227	226	235	222	217	221	224	217	212	211	224	222	199	197	24
27	188	194	214	212	188	191	180	190	207	227	224	252	296	313	15	266	286	293	202	165	175	175	181	182	24
28	183	185	200	202	200	194	175	185	214	184	176	226	275	217	199	205	220	206	198	175	186	208	202	196	24
29	180	194	190	196	194	197	999	999	203	216	230	243	262	277	305	232	189	237	199	143	160	149	168	180	22
30	172	176	184	181	185	206	187	204	215	227	224	183	222	224	244	239	229	232	235	251	234	229	233	218	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 541
% DATA RECOVERY: 75.1

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 07/ 1 /92
TO: 07/ 31 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	194	211	210	173	195	196	192	197	214	218	217	239	238	231	232	241	263	281	290	312	312	312	323	7	24
2	33	71	166	320	114	110	119	109	130	152	189	188	227	248	235	239	273	275	267	290	294	305	300	301	24
3	316	314	309	313	317	305	292	302	304	302	279	273	273	300	314	310	298	288	302	291	275	308	305	304	24
4	286	288	298	322	333	318	324	340	345	343	345	338	331	324	328	336	327	307	72	0	297	306	295	305	24
5	52	156	23	354	332	359	20	39	61	65	63	59	339	329	338	337	327	350	357	344	283	313	32	4	24
6	16	29	60	83	93	180	293	294	290	278	286	281	277	269	272	276	284	283	273	271	260	236	197	186	24
7	206	222	232	224	211	181	205	271	282	262	258	228	243	240	242	248	238	198	197	163	150	208	186	222	24
8	182	131	170	156	197	173	187	208	133	165	220	253	261	250	210	226	244	322	26	352	212	33	67	29	24
9	357	144	193	159	193	176	179	200	219	236	248	234	237	264	322	129	151	135	178	197	311	174	145	212	24
10	182	184	190	165	175	63	38	217	277	294	325	315	311	308	302	257	172	999	116	58	195	245	280	75	23
11	130	206	193	203	283	340	82	11	306	339	357	12	50	80	87	113	130	107	111	121	136	146	195	196	24
12	141	143	166	164	159	149	215	221	135	181	202	216	180	99	185	247	229	171	2	6	87	59	87	84	24
13	37	28	80	83	358	45	72	99	115	168	171	233	259	235	29	306	128	70	146	168	73	99	20	16	24
14	99	136	147	144	140	175	135	167	187	211	254	267	228	301	20	240	274	315	257	193	268	108	22	131	24
15	213	88	89	109	66	85	82	116	156	179	187	214	205	216	236	229	182	193	283	358	32	36	105	98	24
16	97	356	41	119	132	125	131	142	156	149	170	176	167	178	176	167	196	190	191	58	112	225	25	52	24
17	64	83	64	68	71	41	62	95	134	134	128	141	128	119	93	106	105	95	102	106	101	30	33	68	24
18	10	19	89	57	68	86	123	115	124	127	105	99	98	94	105	168	231	158	168	158	83	999	999	84	22
19	46	49	96	78	115	131	129	109	118	157	199	246	20	190	161	143	112	159	193	350	103	63	224	248	24
20	61	5	25	26	33	48	63	76	97	106	90	90	74	83	100	119	149	136	134	144	118	113	62	87	24
21	83	99	90	64	63	82	67	89	100	127	141	105	102	105	120	166	179	105	227	285	269	54	39	27	24
22	64	73	90	79	62	109	126	125	126	146	139	157	137	119	93	104	111	110	128	116	104	100	116	109	24
23	109	104	55	77	57	92	91	109	123	132	147	124	143	107	143	103	101	148	219	292	324	349	350	43	24
24	53	81	108	120	99	69	70	102	145	151	166	185	240	196	276	236	279	253	271	290	198	76	52	92	24
25	118	124	126	119	87	85	92	126	141	144	164	154	219	33	260	305	123	139	110	69	210	253	270	228	24
26	209	281	184	165	145	52	40	38	52	14	344	330	116	277	206	201	237	217	280	292	304	314	316	335	24
27	310	347	80	138	185	174	214	198	343	309	247	272	260	242	247	258	263	279	286	283	289	297	314	310	24
28	263	207	261	219	214	297	340	201	287	283	258	247	243	258	258	269	260	270	273	275	267	279	293	302	24
29	303	302	194	169	167	192	272	259	254	287	280	285	245	256	267	261	264	262	272	269	283	276	262	239	24
30	192	186	255	207	220	150	189	205	216	261	294	263	253	246	291	251	222	230	239	251	172	123	211	207	24
31	192	181	165	93	175	195	53	230	297	316	286	268	274	269	317	25	24	78	203	223	206	162	179	250	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 741
% DATA RECOVERY: 99.6

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 08/ 1 /92
TO: 08/ 31 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	213	193	182	176	177	186	138	235	295	305	296	265	260	267	276	293	276	279	316	109	152	151	86	191	24
2	193	206	84	141	164	149	46	84	214	226	233	254	285	248	210	290	190	100	198	313	357	91	213	124	24
3	131	113	110	102	198	164	216	246	248	261	291	325	270	206	211	232	211	249	351	90	198	197	191	161	24
4	211	228	187	176	179	172	166	191	215	254	256	267	223	280	323	272	228	153	149	180	177	175	180	184	24
5	191	168	172	150	131	278	96	189	217	226	247	196	154	244	330	32	99	67	66	131	161	107	90	173	24
6	132	112	152	133	89	69	84	110	94	104	999	999	194	173	86	145	146	170	239	55	37	45	147	137	22
7	103	36	46	76	66	27	51	53	46	72	91	6	37	155	236	220	234	287	342	34	354	15	79	100	24
8	91	93	93	101	115	77	80	69	117	165	182	186	226	263	98	299	208	234	249	236	198	201	242	241	24
9	206	192	190	199	185	196	199	195	208	282	209	291	216	187	187	248	275	277	223	218	223	291	285	289	24
10	289	300	210	259	309	317	281	263	290	300	999	199	237	252	241	309	24	351	332	210	311	223	133	186	23
11	123	53	70	83	106	94	101	119	137	140	156	174	171	186	207	186	81	88	82	46	68	91	121	127	24
12	70	108	127	108	90	82	92	105	127	145	149	166	202	251	275	47	95	111	129	136	125	129	102	122	24
13	130	129	131	106	127	122	148	161	172	186	188	183	193	208	203	206	188	204	50	159	174	124	216	177	24
14	156	193	176	170	163	160	174	170	177	182	192	201	205	230	244	285	42	49	28	166	146	125	134	142	24
15	156	140	209	167	150	133	145	191	211	177	189	201	184	305	302	301	11	106	110	72	160	124	115	129	24
16	133	135	108	152	143	107	102	138	148	166	197	210	223	142	66	183	200	201	206	107	116	135	132	122	24
17	138	139	145	104	62	118	128	161	167	159	165	201	202	175	181	249	267	278	294	280	284	122	105	81	24
18	78	114	74	311	135	150	128	124	184	237	273	209	265	240	240	273	253	294	332	328	360	97	129	157	24
19	173	182	174	238	271	305	344	67	132	125	142	241	235	224	225	220	109	141	156	252	238	352	78	83	24
20	163	159	174	176	165	205	161	223	227	291	288	247	239	202	223	255	211	269	299	138	92	46	90	108	24
21	94	248	34	63	58	40	56	71	94	131	169	128	124	132	152	147	123	170	194	171	148	48	22	36	24
22	36	39	52	59	57	52	68	86	91	104	104	97	115	129	202	44	111	72	20	15	56	59	28	351	24
23	23	61	62	54	46	18	353	28	50	64	60	61	55	32	68	51	51	3	25	61	40	20	38	34	24
24	36	39	50	50	50	48	59	66	71	73	95	99	106	109	103	106	112	100	93	96	97	91	95	94	24
25	88	95	95	90	89	89	87	105	116	113	103	107	111	101	97	99	100	103	96	86	90	91	93	75	24
26	76	82	83	77	73	74	68	70	98	110	92	86	71	78	75	70	83	90	74	86	105	100	124	134	24
27	100	100	95	128	138	160	140	117	166	185	200	247	261	221	259	206	220	254	268	278	279	255	212	219	24
28	204	155	158	194	184	193	208	199	211	220	225	241	170	57	319	273	262	258	252	241	235	183	187	187	24
29	163	167	174	167	186	185	174	181	188	221	222	257	285	299	272	281	324	291	86	133	151	179	162	169	24
30	199	206	199	210	219	234	153	198	134	182	175	143	174	206	215	287	333	169	167	125	153	193	198	63	24
31	85	107	175	41	97	34	81	97	69	128	167	275	146	179	254	190	200	269	105	95	125	67	85	49	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 741
% DATA RECOVERY: 99.6

EBASCO ENVIRONMENTAL — AIR QUALITY/METEOROLOGY DATA SUMMARY — 12-13-1992
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 09/ 1 /92
TO: 09/ 30 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	68	93	38	47	27	63	61	68	93	119	113	89	86	141	89	87	128	114	39	82	21	350	53	23	24
2	348	42	16	330	29	50	53	65	81	90	94	120	113	114	71	57	88	122	96	93	97	86	71	30	24
3	37	62	77	69	58	42	62	80	93	124	130	139	154	133	80	44	5	43	16	54	75	70	64	68	24
4	39	53	55	46	57	68	72	63	94	108	121	118	83	93	86	70	55	89	285	68	153	45	66	86	24
5	90	101	102	86	77	88	97	116	132	138	136	142	140	136	121	128	139	78	104	84	80	92	103	96	24
6	106	101	94	85	76	52	63	74	96	115	106	111	83	76	120	86	89	72	54	50	74	72	72	83	24
7	83	76	78	78	76	41	50	63	79	91	77	75	64	51	66	68	84	78	70	86	64	74	74	53	24
8	73	97	66	111	16	6	9	12	40	35	46	45	15	28	39	47	32	56	41	13	63	52	58	57	24
9	31	339	32	6	19	9	19	32	26	18	30	45	16	7	33	82	106	100	94	79	109	106	124	114	24
10	125	111	81	128	107	111	101	142	173	208	239	230	312	295	211	335	27	79	99	108	143	163	75	75	24
11	145	161	175	158	117	196	210	185	210	282	293	302	289	274	263	295	30	44	9	35	317	73	33	8	24
12	353	9	335	27	89	343	4	32	41	64	83	65	58	36	29	15	70	103	99	103	91	88	90	28	24
13	4	356	8	338	357	17	21	52	50	51	64	77	61	39	32	17	84	44	346	40	42	46	42	47	24
14	41	30	28	14	30	36	49	53	58	63	61	66	73	73	67	78	77	68	73	69	50	38	45	53	24
15	41	5	36	33	37	45	53	52	60	69	86	83	85	64	71	60	62	84	196	286	49	91	92	97	24
16	111	93	106	71	69	45	55	69	74	76	73	71	63	70	62	49	82	86	52	65	75	71	66	76	24
17	53	41	20	356	334	335	19	38	52	58	63	60	47	58	76	117	104	88	97	85	65	72	80	60	24
18	32	350	355	37	36	78	78	82	85	83	65	79	59	75	69	67	108	115	120	154	248	294	320	54	24
19	143	128	125	86	90	15	62	63	144	254	260	277	306	255	223	228	311	334	28	145	156	340	46	98	24
20	124	123	66	3	334	8	30	30	110	186	182	215	264	258	234	241	239	249	71	74	46	130	130	108	24
21	109	112	131	109	129	109	81	110	171	197	255	260	257	231	263	201	148	124	107	107	119	112	139	166	24
22	137	145	167	107	97	102	106	106	188	175	152	179	233	193	175	216	200	282	305	316	318	348	156	222	24
23	227	88	141	177	169	265	334	32	355	33	324	269	275	324	44	53	72	131	142	336	33	112	60	70	24
24	70	96	2	358	21	36	27	29	49	77	999	66	69	69	61	57	164	111	91	87	60	49	67	45	23
25	52	51	48	50	53	56	55	60	76	98	100	105	119	130	126	75	80	72	100	117	94	98	102	99	24
26	86	75	72	79	68	71	81	81	114	124	134	134	139	138	91	97	105	101	99	117	110	94	83	73	24
27	79	81	86	82	79	43	19	26	58	81	82	87	80	77	50	66	66	65	51	52	55	44	357	332	24
28	341	334	338	330	321	333	333	335	330	330	332	323	325	322	322	289	326	304	301	291	335	303	287	303	24
29	302	294	293	297	298	300	304	292	304	293	302	315	310	314	321	337	322	329	22	24	333	322	336	340	24
30	325	324	334	306	327	329	327	345	11	39	42	42	43	38	36	31	34	42	34	36	39	39	40	29	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 719
% DATA RECOVERY: 99.9

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND DIRECTION
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: DEGREES

FROM: 10/ 1 /92
TO: 10/ 14 /92

	HOUR																							
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	OBS
1	4	11	17	37	42	53	52	54	62	69	76	83	86	79	73	69	67	56	58	61	63	60	55	64	24
2	73	80	56	48	34	43	63	64	63	64	69	72	67	68	66	60	75	68	71	73	71	74	76	84	24
3	88	89	97	102	101	107	111	112	118	117	121	119	116	117	132	145	164	169	155	149	155	150	153	155	24
4	158	160	182	195	193	196	200	194	207	223	249	253	254	258	253	246	256	259	264	262	262	262	270	294	24
5	309	323	302	289	283	255	273	263	279	295	288	292	296	292	290	291	304	308	331	334	330	328	327	333	24
6	335	335	329	327	324	322	316	318	307	340	321	359	346	11	346	302	319	306	316	295	297	299	307	302	24
7	299	339	346	18	19	33	35	38	49	60	51	46	75	64	67	67	64	61	60	56	48	43	39	39	24
8	35	38	42	33	26	28	20	43	60	113	146	174	207	227	234	235	203	262	276	306	228	258	244	217	24
9	206	213	213	206	154	154	150	169	217	283	291	275	289	296	296	283	271	269	281	300	314	307	313	315	24
10	307	317	316	309	320	314	34	6	0	1	295	311	343	345	315	331	344	355	334	359	61	76	95	99	24
11	100	57	56	109	58	13	84	174	99	38	349	288	296	302	272	296	297	292	286	235	296	295	293	303	24
12	318	316	333	329	357	345	8	1	14	31	23	30	23	330	343	331	327	335	328	332	332	329	3	327	24
13	316	344	314	320	333	312	346	348	15	25	36	335	347	30	23	44	43	50	55	40	77	53	37	57	24
14	43	44	38	38	29	33	35	36	62	80	87	100	93	90	97	94	79	86	71	69	70	75	50	43	24

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

OBSERVATIONS: 336
% DATA RECOVERY: 100.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 02/ 15 /92
TO: 02/ 29 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
15	7.0	4.4	5.2	4.2	4.9	3.7	3.9	2.6	5.7	11.4	15.1	14.5	13.3	12.4	10.6	9.5	12.4	10.5	7.5	3.8	5.5	6.7	6.7	6.4	7.8	24
16	5.0	3.6	4.0	5.0	5.0	6.4	6.4	5.5	6.9	6.4	7.8	11.9	9.4	8.8	6.9	6.9	6.6	4.8	3.0	2.4	2.2	2.9	2.4	2.1	5.5	24
17	2.6	1.7	2.7	4.1	2.1	4.7	4.0	4.2	6.1	6.5	10.7	11.4	15.1	12.9	11.2	10.7	8.4	6.3	4.9	10.2	8.7	3.4	6.9	8.3	7.0	24
18	7.9	7.5	5.9	5.8	4.7	5.8	3.9	4.6	4.3	6.9	7.7	8.4	8.5	7.4	7.8	4.9	6.7	6.7	6.1	7.4	5.1	5.6	5.0	6.1	6.3	24
19	6.5	5.7	5.3	7.4	7.4	9.3	8.4	7.0	6.7	7.7	8.5	8.7	9.2	9.1	9.0	10.4	8.0	7.2	7.0	3.4	2.4	2.6	2.7	1.9	6.7	24
20	2.2	2.0	2.0	3.4	6.0	5.1	4.2	5.7	9.8	14.3	12.1	12.3	11.1	11.1	11.2	10.1	9.6	10.4	9.4	9.1	9.2	8.7	9.5	7.5	8.2	24
21	6.2	6.2	4.9	6.0	5.4	6.0	5.2	5.9	7.4	9.5	11.0	11.9	10.8	10.9	11.0	11.2	11.2	12.2	8.8	8.0	8.4	8.2	7.5	7.5	8.4	24
22	7.3	6.1	6.2	5.0	5.0	4.9	4.5	4.6	8.5	11.5	11.5	9.2	12.1	10.1	11.6	9.1	8.4	7.5	7.0	6.6	6.8	3.7	8.4	6.9	7.6	24
23	4.9	3.7	3.5	5.0	4.1	3.0	4.8	7.5	7.7	8.9	11.8	13.6	11.8	10.5	7.9	6.5	8.6	6.6	5.7	6.3	4.1	3.7	2.6	2.9	6.5	24
24	2.7	3.9	3.7	1.8	5.0	5.9	3.1	3.4	6.7	4.3	6.4	6.8	4.7	5.5	7.6	5.4	3.7	6.2	6.7	6.8	4.9	3.0	5.7	4.4	4.9	24
25	8.0	3.7	3.7	4.6	5.8	4.9	4.5	5.7	7.5	9.7	10.3	11.5	8.0	11.5	9.6	13.2	11.5	7.9	7.3	9.6	11.9	13.4	6.2	4.2	8.1	24
26	6.3	5.8	6.4	7.8	8.4	7.7	8.0	8.7	10.5	8.8	11.2	13.5	13.4	15.1	18.1	17.8	16.3	12.8	11.9	12.6	12.1	10.6	10.6	9.6	11.0	24
27	9.9	11.9	11.1	12.6	9.8	9.4	8.8	7.7	6.7	8.9	10.9	11.1	9.5	9.8	11.2	13.0	11.0	9.5	8.3	5.0	5.5	5.3	4.2	5.1	9.0	24
28	4.7	5.1	7.2	7.1	6.0	5.6	4.8	4.9	7.9	7.2	8.1	10.0	10.9	13.4	14.1	13.7	12.5	10.9	8.4	8.1	5.9	5.8	6.6	7.5	8.2	24
29	7.0	7.2	8.0	7.6	6.0	5.6	5.1	4.9	6.9	9.9	12.3	10.7	9.3	10.0	9.3	9.8	8.6	7.4	5.4	6.7	5.6	5.6	4.9	4.6	7.4	24
AVG	5.9	5.2	5.3	5.8	5.7	5.9	5.3	5.5	7.3	8.8	10.4	11.0	10.5	10.6	10.5	10.1	9.6	8.5	7.2	7.1	6.6	5.9	6.0	5.7		
MIN	2.2	1.7	2.0	1.8	2.1	3.0	3.1	2.6	4.3	4.3	6.4	6.8	4.7	5.5	6.9	4.9	3.7	4.8	3.0	2.4	2.2	2.6	2.4	1.9		
MAX	9.9	11.9	11.1	12.6	9.8	9.4	8.8	8.7	10.5	14.3	15.1	14.5	15.1	15.1	18.1	17.8	16.3	12.8	11.9	12.6	12.1	13.4	10.6	9.6		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	7.5
MINIMUM:	1.7
MAXIMUM:	18.1
OBSERVATIONS:	360
% DATA RECOVERY:	100.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND-SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 03/-1-/92
TO: 03/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	3.8	3.2	2.5	2.3	2.1	3.1	2.0	1.6	3.2	4.0	3.6	4.2	6.2	6.2	4.6	4.6	2.8	2.3	3.5	3.5	4.1	3.2	3.5	4.2	3.5	24
2	2.8	3.7	2.3	4.5	4.0	4.7	4.4	4.1	5.2	5.6	6.7	6.7	6.8	6.0	5.8	4.3	4.1	2.6	2.8	2.6	6.1	4.4	2.1	2.3	4.4	24
3	3.4	2.6	2.8	3.4	3.2	3.2	3.3	2.4	2.0	3.9	4.2	7.8	9.4	8.8	7.6	7.5	7.2	6.5	6.9	6.7	7.0	5.6	5.3	4.3	5.2	24
4	4.0	4.2	4.3	4.1	3.3	3.8	3.9	4.1	4.5	6.4	10.9	13.3	12.0	10.4	8.6	6.7	7.2	7.7	5.8	5.6	3.4	3.2	8.3	6.4	6.3	24
5	5.5	4.1	3.8	4.9	5.1	5.5	6.0	6.5	9.9	13.0	13.9	13.3	12.5	11.9	11.2	11.9	11.3	11.7	11.7	9.6	10.4	8.7	6.7	6.2	9.0	24
6	6.4	5.9	5.4	3.6	4.3	4.2	3.8	4.6	9.9	13.2	13.5	12.0	12.2	11.3	9.3	6.9	4.9	9.5	8.1	6.0	5.8	5.5	2.9	2.8	7.2	24
7	3.3	3.3	3.6	4.4	6.5	6.0	6.2	6.5	5.6	6.3	6.7	6.9	7.7	11.1	12.3	11.9	11.5	8.8	6.6	5.9	6.1	6.5	6.5	6.5	6.9	24
8	6.3	7.6	6.6	5.9	4.8	5.9	3.8	3.8	4.8	4.7	4.8	4.8	7.2	4.8	5.1	4.2	2.8	2.2	2.1	4.6	5.6	3.4	2.3	2.3	4.6	24
9	3.5	4.1	3.3	3.6	3.7	3.2	4.1	3.5	4.1	8.0	10.7	10.8	10.9	10.2	11.3	9.9	8.5	7.9	5.8	4.7	4.4	6.1	4.5	5.1	6.3	24
10	5.2	6.0	6.4	5.8	5.9	5.4	5.7	6.6	11.9	14.6	14.9	13.8	15.5	17.1	17.8	18.5	16.4	15.0	15.5	12.6	11.5	11.2	8.1	5.8	11.1	24
11	5.2	6.2	7.0	6.6	7.3	11.9	11.1	12.7	12.5	10.1	8.1	9.0	7.2	7.4	6.6	8.2	8.6	7.3	7.6	7.6	7.4	5.7	3.9	4.8	7.9	24
12	4.4	4.2	5.1	5.1	4.5	4.3	3.9	5.3	5.1	5.4	5.9	4.5	2.9	5.1	6.5	4.5	3.4	2.1	3.7	6.6	6.2	6.5	3.5	3.1	4.7	24
13	3.2	2.7	3.7	5.3	3.5	2.7	4.0	3.9	4.6	6.1	7.8	8.3	8.0	8.1	7.8	8.3	8.5	8.9	7.8	5.4	5.0	4.0	5.4	4.7	5.7	24
14	6.7	6.4	5.7	5.5	4.4	3.6	3.3	3.6	5.7	6.3	5.8	6.6	5.4	5.1	6.4	5.1	4.7	6.3	6.2	6.0	7.0	6.0	5.6	4.7	5.5	24
15	5.6	6.8	6.2	5.2	3.5	3.5	3.1	5.1	8.1	9.1	9.8	8.7	8.2	8.6	9.5	10.8	10.8	9.8	8.4	7.3	7.8	6.9	6.1	7.2	7.3	24
16	7.2	7.6	6.4	7.5	5.7	4.6	6.1	8.8	11.3	11.0	10.4	8.9	8.5	7.7	7.3	6.7	7.1	9.1	9.0	8.9	9.2	7.8	6.0	5.5	7.8	24
17	5.0	4.3	3.6	3.6	4.8	4.8	3.6	4.2	6.6	10.9	10.1	7.4	7.4	5.7	5.8	5.3	5.0	4.3	6.3	6.2	7.2	9.4	7.6	5.6	6.0	24
18	4.9	5.0	6.4	5.8	6.5	3.9	3.9	5.3	10.4	13.7	14.9	14.5	14.0	14.0	11.0	9.8	8.3	5.7	6.3	5.4	5.9	5.1	4.9	6.0	8.0	24
19	6.1	8.3	10.3	8.6	7.2	8.2	9.5	9.4	13.0	14.5	16.4	16.7	17.1	16.5	17.6	16.6	15.0	14.8	9.8	8.0	8.5	8.5	8.2	8.6	11.6	24
20	9.1	10.6	8.7	7.1	6.4	7.0	6.1	6.7	9.9	13.1	16.8	16.5	16.6	16.2	15.4	14.9	14.6	12.4	11.2	11.1	9.4	9.2	7.9	6.9	11.0	24
21	6.7	6.7	6.4	5.6	3.7	3.4	6.0	5.7	8.1	7.6	8.2	7.2	6.0	5.5	4.4	3.7	4.5	3.9	3.5	2.9	5.9	5.1	3.0	3.6	5.3	24
22	3.4	2.5	3.5	3.1	4.1	2.3	2.4	3.8	4.9	6.6	8.1	11.6	13.9	12.6	10.6	4.8	4.7	4.8	2.5	3.6	6.4	6.8	6.4	8.0	5.9	24
23	8.0	12.1	9.1	10.1	9.7	7.8	7.4	7.4	10.0	12.6	12.8	14.1	13.1	14.4	14.1	12.7	11.9	9.7	6.4	4.9	6.8	6.6	5.1	3.4	9.6	24
24	2.0	2.7	5.3	6.8	6.3	6.1	4.7	6.5	10.0	10.5	11.2	11.7	10.6	9.5	11.1	13.2	13.9	15.0	14.3	12.2	9.7	8.4	8.2	7.9	9.1	24
25	8.1	8.8	8.9	6.7	5.7	6.0	6.0	5.9	10.5	17.1	16.6	19.1	16.1	16.8	18.0	17.6	16.2	14.7	10.9	8.4	6.3	4.0	2.6	3.0	10.6	24
26	2.6	3.6	2.8	2.6	2.6	2.6	2.9	2.6	5.8	9.1	9.8	11.3	10.1	10.4	11.0	9.3	9.7	8.8	7.7	5.5	5.4	4.4	4.8	4.3	6.2	24
27	4.6	3.9	3.1	1.3	3.1	2.4	3.2	1.4	2.6	4.4	5.6	5.6	5.8	6.9	5.0	6.8	7.2	7.8	6.9	6.8	4.2	4.4	3.7	4.6	4.6	24
28	4.1	5.1	4.8	5.0	5.0	4.1	4.8	5.6	7.5	11.0	8.7	7.2	5.7	5.5	5.3	5.6	5.3	4.7	3.2	3.8	4.5	3.9	5.7	4.6	5.4	24
29	4.9	4.6	4.8	5.3	5.2	4.6	4.2	5.3	5.7	5.1	7.3	6.5	5.3	5.8	4.5	3.0	3.4	4.6	3.3	3.2	4.3	4.2	4.2	3.6	4.7	24
30	2.3	3.2	2.6	2.6	8.1	6.4	3.2	4.3	4.7	8.1	9.8	9.8	8.9	9.7	9.4	10.8	11.2	7.6	8.4	14.1	10.0	11.4	8.8	10.4	7.7	24
31	9.5	8.3	8.2	7.7	7.6	5.8	6.0	8.2	11.3	11.1	11.5	11.3	11.5	10.9	12.8	12.0	11.5	10.7	9.3	7.7	6.6	6.5	5.3	4.5	9.0	24
AVG	5.1	5.4	5.3	5.1	5.1	4.9	4.8	5.3	7.4	9.1	9.9	10.0	9.8	9.7	9.5	8.9	8.5	8.0	7.1	6.7	6.7	6.2	5.4	5.2		
MIN	2.0	2.5	2.3	1.3	2.1	2.3	2.0	1.4	2.0	3.9	3.6	4.2	2.9	4.8	4.4	3.0	2.8	2.1	2.1	2.6	3.4	3.2	2.1	2.3		
MAX	9.5	12.1	10.3	10.1	9.7	11.9	11.1	12.7	13.0	17.1	16.8	19.1	17.1	17.1	18.0	18.5	16.4	15.0	15.5	14.1	11.5	11.4	8.8	10.4		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	7.0
MINIMUM:	1.3
MAXIMUM:	19.1
OBSERVATIONS:	744
% DATA RECOVERY:	100.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 04/ 1 /92
TO: 04/ 30 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	4.5	3.6	4.6	4.2	3.5	3.2	2.0	1.9	4.4	5.9	6.6	7.8	7.8	7.8	7.0	6.8	8.2	8.6	11.0	10.6	8.4	6.5	6.2	5.8	6.1	24
2	5.2	5.1	5.7	6.2	6.0	4.1	3.0	4.0	7.1	6.3	4.5	4.9	99.9	7.3	8.3	7.9	7.9	8.4	8.5	8.5	5.3	6.6	7.0	7.0	6.3	23
3	5.9	6.9	5.3	4.5	5.3	4.3	4.1	6.4	8.0	9.7	8.3	6.0	4.5	3.7	4.9	4.9	4.9	4.1	2.1	1.2	2.1	2.7	4.8	4.8	5.0	24
4	5.4	4.9	3.9	5.4	5.3	5.0	4.1	4.8	7.8	9.3	6.9	4.8	6.1	6.9	8.4	10.9	12.0	11.0	8.0	6.7	6.6	7.3	6.1	6.5	6.8	24
5	5.8	4.4	4.1	3.6	3.8	4.8	4.1	5.2	9.0	8.8	8.7	7.9	8.3	7.6	6.7	7.2	6.8	12.4	12.3	11.8	11.1	10.2	8.4	8.0	7.5	24
6	6.5	6.2	5.5	5.2	5.3	5.7	6.1	7.7	13.8	16.6	15.9	14.8	15.6	99.9	12.8	12.6	10.4	8.2	6.9	5.1	4.9	4.4	8.3	11.7	9.1	23
7	17.1	12.1	6.4	2.3	3.2	3.8	3.9	4.9	8.5	10.3	11.1	11.9	8.8	6.6	99.9	9.2	7.4	7.5	7.7	5.9	4.3	4.6	4.8	5.7	7.3	23
8	5.4	4.7	2.8	3.0	2.3	2.6	3.5	3.6	4.2	99.9	99.9	7.8	7.8	7.2	6.8	5.8	5.7	4.9	5.4	7.7	7.4	5.1	4.6	5.7	5.2	22
9	9.4	7.1	5.5	6.0	5.4	4.9	5.2	4.6	5.6	7.0	8.0	9.4	10.0	9.1	8.7	9.4	9.4	10.6	9.9	9.1	7.7	6.3	6.8	5.4	7.5	24
10	3.9	3.9	3.6	3.6	4.0	3.3	3.3	4.1	7.5	10.2	8.3	8.6	8.4	8.7	8.9	7.6	10.7	14.0	15.8	5.5	4.4	3.6	7.4	6.1	6.9	24
11	4.2	3.8	3.8	3.4	4.3	5.3	5.8	7.0	10.0	12.2	12.4	9.8	8.2	6.9	7.5	8.7	9.7	7.6	5.7	5.1	7.0	5.0	2.1	3.7	6.6	24
12	2.7	5.1	5.4	6.3	6.4	4.4	2.7	1.7	2.4	3.1	3.5	2.8	3.2	6.6	6.7	10.8	5.5	3.7	2.8	2.3	2.7	3.7	2.6	1.8	4.1	24
13	2.3	3.1	3.2	3.4	2.6	2.7	3.2	5.5	7.3	8.8	9.2	11.5	11.4	11.8	12.1	13.7	14.2	15.7	12.5	10.2	11.7	10.8	10.5	10.1	8.6	24
14	8.8	7.2	6.6	6.4	6.4	7.0	5.9	7.5	10.7	13.5	17.0	16.3	14.6	14.5	14.1	13.8	15.1	14.7	11.5	9.1	7.3	6.4	5.8	5.8	10.3	24
15	5.7	5.6	5.0	5.2	4.6	4.4	2.7	5.8	9.6	11.9	13.7	13.3	13.5	13.3	14.0	14.0	14.4	13.7	11.8	8.9	7.2	4.7	3.4	4.0	8.8	24
16	4.3	4.0	5.1	5.6	6.3	5.3	5.6	5.9	11.8	14.9	13.2	11.8	15.1	16.2	15.6	15.6	14.1	14.4	11.5	10.4	10.3	9.4	7.3	4.7	9.9	24
17	4.6	4.4	4.4	4.5	4.3	4.6	4.0	5.6	10.4	13.8	10.9	9.5	10.1	10.2	10.1	9.7	10.5	10.5	10.0	9.1	7.5	6.3	5.5	5.7	7.8	24
18	4.4	4.0	4.2	4.4	4.3	4.0	4.5	5.0	9.4	11.5	11.4	11.4	9.3	9.1	9.8	9.8	9.0	8.4	6.1	8.9	9.2	9.3	9.3	8.8	7.7	24
19	7.4	5.7	5.3	6.2	6.3	5.0	5.3	9.9	12.9	15.2	15.4	16.4	15.9	14.2	14.6	7.8	10.7	6.1	4.2	4.9	7.5	8.0	4.0	2.3	8.8	24
20	3.6	4.9	8.5	8.9	4.4	4.0	3.7	6.0	7.1	10.9	13.6	13.1	15.1	15.4	14.1	16.9	13.1	9.1	5.9	7.0	4.9	5.2	2.2	4.9	8.4	24
21	6.6	7.2	7.1	8.8	8.2	7.4	7.9	9.4	12.5	12.4	10.3	5.7	5.4	3.5	5.6	7.5	9.0	7.6	7.9	8.7	8.9	6.7	4.8	3.1	7.6	24
22	3.1	1.7	1.8	2.3	3.7	3.7	3.3	3.9	5.7	5.2	4.9	4.3	3.9	4.5	3.4	3.2	2.0	2.1	6.6	6.8	4.9	3.4	3.3	3.5	3.8	24
23	3.6	3.8	5.1	5.1	5.1	4.6	4.9	6.8	8.9	6.7	6.2	6.2	5.4	6.1	4.2	4.0	5.4	9.0	6.2	4.3	6.8	2.6	2.6	3.4	5.3	24
24	1.9	1.6	1.5	1.7	1.6	1.7	2.2	1.4	1.6	2.7	2.4	2.3	2.7	4.5	3.1	8.5	5.9	6.0	4.1	4.4	2.7	3.5	4.4	3.8	3.2	24
25	4.7	5.3	5.0	4.5	2.6	2.6	3.6	4.3	5.1	6.3	6.9	6.8	7.9	8.0	9.0	11.1	10.3	11.0	9.3	6.6	6.5	6.7	7.9	8.2	6.7	24
26	7.4	7.0	7.1	7.0	7.0	7.7	7.9	8.6	9.1	9.0	8.9	8.9	8.7	8.6	9.4	11.8	11.8	11.2	9.9	8.4	7.3	8.0	7.8	5.8	8.5	24
27	5.8	5.0	4.1	7.3	11.3	10.1	6.7	7.6	11.1	13.5	11.1	11.8	13.9	15.6	13.5	13.9	12.3	11.9	10.3	8.4	5.5	4.8	4.5	4.9	9.4	24
28	5.1	4.4	5.5	8.8	8.8	9.5	8.5	7.7	11.8	11.8	13.2	15.5	16.8	17.5	15.8	15.2	13.2	11.9	9.7	7.4	6.2	5.2	6.3	4.8	10.0	24
29	4.1	3.9	4.2	4.8	4.3	4.6	4.2	5.9	8.3	9.3	8.7	8.8	8.2	7.9	7.0	7.1	6.5	5.6	3.5	3.1	5.5	3.5	3.5	3.4	5.7	24
30	3.7	3.0	2.5	1.8	1.7	2.2	3.0	3.3	4.0	3.4	3.5	4.3	3.9	3.8	4.2	3.9	2.7	2.0	2.1	4.6	5.4	4.4	3.2	2.6	3.3	24
AVG	5.4	5.0	4.8	5.0	4.9	4.7	4.5	5.5	8.2	9.7	9.5	9.1	9.3	9.1	9.2	9.6	9.3	9.1	8.0	7.0	6.6	5.8	5.5	5.4		
MIN	1.9	1.6	1.5	1.7	1.6	1.7	2.0	1.4	1.6	2.7	2.4	2.3	2.7	3.5	3.1	3.2	2.0	2.0	2.1	1.2	2.1	2.6	2.1	1.8		
MAX	17.1	12.1	8.5	8.9	11.3	10.1	8.5	9.9	13.8	16.6	17.0	16.4	16.8	17.5	15.8	16.9	15.1	15.7	15.8	11.8	11.7	10.8	10.5	11.7		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	7.1
MINIMUM:	1.2
MAXIMUM:	17.5
OBSERVATIONS:	715
% DATA RECOVERY:	99.3

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 05/ 1 /92
TO: 05/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	2.4	3.2	2.3	3.3	3.5	3.7	3.7	4.6	7.4	8.6	7.0	6.8	6.1	5.5	3.8	4.5	4.1	6.1	6.8	4.3	4.0	3.8	5.1	3.7	4.8	24
2	1.6	2.2	1.6	2.4	1.9	2.0	2.5	3.0	3.0	3.0	3.2	3.3	4.2	4.6	4.6	5.4	4.7	3.8	1.9	2.6	4.0	2.7	3.6	5.5	3.2	24
3	3.9	3.7	3.2	2.3	1.7	1.4	2.0	4.0	6.8	7.3	6.6	6.5	7.6	8.0	8.3	8.9	9.8	8.9	8.3	6.8	5.7	4.4	4.3	4.0	5.6	24
4	4.9	3.9	4.4	3.9	3.6	3.5	4.5	4.9	6.8	8.1	8.3	7.6	8.5	9.0	9.1	10.5	10.6	10.6	9.2	7.1	7.1	6.0	4.2	2.3	6.6	24
5	1.6	2.7	3.4	3.3	3.9	2.9	2.7	3.7	4.1	4.5	4.8	5.7	5.4	5.3	4.9	6.2	7.7	9.7	8.9	7.5	6.5	7.4	6.4	5.1	5.2	24
6	4.2	3.8	5.0	4.6	4.5	4.3	4.2	4.8	4.3	4.3	5.6	8.1	9.0	7.6	9.4	10.9	10.6	8.6	9.2	8.7	6.0	4.6	3.6	3.8	6.2	24
7	4.8	4.5	3.3	4.9	4.5	4.3	4.7	6.1	5.0	4.8	4.5	6.2	10.8	13.8	13.9	12.6	11.8	11.2	9.9	7.6	7.2	5.7	4.7	5.9	7.2	24
8	4.3	2.3	1.6	1.9	2.9	4.6	5.0	6.8	8.6	13.2	13.8	12.0	12.1	13.8	12.8	11.6	10.2	9.4	7.6	6.7	5.6	4.3	4.1	4.1	7.5	24
9	3.7	2.7	2.0	1.7	3.7	3.0	1.7	1.5	3.5	4.5	4.4	4.7	4.8	4.6	3.8	4.2	3.5	3.1	2.9	6.4	6.0	4.2	3.8	4.0	3.7	24
10	4.1	3.7	4.0	4.6	3.8	3.9	3.1	5.4	5.6	4.5	6.3	6.1	6.3	5.5	4.8	4.9	4.0	2.7	2.5	3.7	5.8	6.4	2.9	2.5	4.5	24
11	1.8	1.5	2.3	3.9	3.0	2.7	2.3	2.2	3.0	3.3	5.3	99.9	10.2	8.7	8.1	9.4	7.9	9.1	9.2	7.7	7.1	5.5	4.8	3.8	5.3	23
12	2.1	1.9	1.6	1.3	1.1	2.3	2.6	3.1	2.5	3.3	3.1	4.3	4.1	3.9	4.0	4.1	5.0	3.3	2.1	3.6	7.8	5.8	5.9	5.0	3.5	24
13	4.9	3.3	3.6	5.2	4.5	2.4	2.2	4.2	3.9	3.9	5.3	8.9	9.4	10.2	11.9	10.8	10.3	12.0	10.6	9.1	8.1	7.9	7.4	7.9	7.0	24
14	8.4	9.1	8.5	6.4	9.9	4.1	5.0	6.2	7.6	7.0	6.5	7.8	7.9	9.0	9.8	9.4	8.7	7.2	6.0	5.8	6.0	4.5	3.3	4.3	7.0	24
15	4.1	2.9	3.1	2.0	1.2	2.0	3.3	4.1	5.7	7.4	9.5	7.5	7.1	6.7	5.9	4.8	9.7	8.1	6.8	6.5	6.0	8.4	7.1	4.4	5.6	24
16	3.4	3.2	3.7	3.7	4.0	5.3	5.4	8.6	10.4	11.0	10.5	8.2	8.7	10.9	11.1	6.7	10.2	11.8	9.9	9.9	8.7	8.3	7.8	6.9	7.8	24
17	6.0	5.9	4.7	3.8	3.9	4.5	4.9	6.8	8.8	10.9	10.4	13.4	15.0	11.9	7.7	10.6	13.5	13.5	12.4	9.5	6.3	5.8	6.7	5.6	8.4	24
18	4.1	5.3	4.6	4.7	4.5	4.4	5.5	9.7	12.3	13.2	13.0	12.0	13.2	99.9	14.0	14.3	13.4	13.6	12.7	10.1	6.4	4.7	4.2	4.1	8.9	23
19	3.9	4.2	3.8	3.3	3.1	3.1	3.3	6.3	10.2	12.0	12.1	14.2	14.5	14.3	14.1	13.3	13.9	14.6	12.4	9.9	8.9	8.3	5.2	4.6	8.9	24
20	3.7	4.4	3.2	3.2	4.2	4.2	4.5	7.6	9.4	10.1	11.3	12.3	11.0	12.1	12.1	12.6	12.2	12.8	10.4	9.0	6.2	7.7	9.3	4.8	8.3	24
21	4.4	5.2	5.8	5.7	4.2	4.8	5.8	9.2	9.5	9.4	10.6	9.4	8.6	8.7	10.4	14.5	14.4	14.5	12.5	11.4	7.8	5.3	3.8	4.6	8.4	24
22	5.0	5.8	3.6	5.3	9.2	4.5	3.4	6.9	10.7	11.7	12.4	10.6	10.1	10.6	11.1	10.4	10.3	12.6	12.2	11.5	8.6	6.8	4.9	4.6	8.5	24
23	5.1	4.0	4.5	4.1	5.0	4.6	6.2	6.4	6.2	6.7	6.6	6.4	6.3	5.7	7.0	6.0	5.6	5.7	5.7	8.4	8.0	6.7	3.7	3.1	5.7	24
24	2.4	3.2	1.6	1.9	2.5	3.2	1.9	2.2	3.6	5.5	6.3	7.2	6.3	6.5	6.1	5.6	5.4	9.8	8.2	6.8	5.0	3.9	2.8	2.6	4.6	24
25	1.4	1.5	2.4	3.0	4.4	4.1	2.7	3.9	5.6	5.5	6.2	6.4	7.8	7.7	8.0	9.9	9.5	9.7	8.7	7.8	5.7	5.9	4.4	3.3	5.6	24
26	3.1	3.1	3.2	3.3	3.1	3.8	3.2	3.8	4.9	6.1	7.0	7.8	8.2	8.9	9.0	9.2	9.6	9.0	8.2	7.7	7.7	6.6	6.6	6.7	6.2	24
27	6.5	5.5	4.4	5.0	2.6	2.9	4.5	5.3	5.3	6.1	4.7	4.4	4.3	6.2	7.2	8.2	7.1	6.0	3.0	6.2	4.1	3.7	3.5	3.4	5.0	24
28	3.2	1.9	1.9	2.9	2.2	2.7	2.7	3.7	3.8	5.1	5.5	6.5	7.1	6.3	7.3	6.7	6.8	6.3	8.6	7.4	6.6	4.0	4.9	4.0	4.9	24
29	3.6	3.4	2.5	4.7	4.0	2.7	2.5	4.1	8.3	9.3	8.1	9.1	7.5	6.7	6.8	7.8	9.1	9.5	8.4	6.0	2.6	3.0	5.8	6.0	5.9	24
30	4.8	3.7	4.0	3.1	2.9	5.7	7.2	6.9	7.3	7.8	6.6	5.2	4.7	6.1	5.3	4.8	5.2	11.0	7.4	8.6	6.4	3.6	2.1	1.8	5.5	24
31	2.5	3.4	2.3	1.4	2.9	2.5	3.2	2.1	2.5	3.3	4.3	4.6	4.8	4.4	4.5	5.0	4.5	6.7	6.1	3.1	5.9	4.5	3.4	3.4	3.8	24
AVG	3.9	3.7	3.4	3.6	3.8	3.6	3.8	5.1	6.3	7.1	7.4	7.8	8.1	8.1	8.3	8.5	8.7	9.1	8.0	7.3	6.4	5.5	4.8	4.4		
MIN	1.4	1.5	1.6	1.3	1.1	1.4	1.7	1.5	2.5	3.0	3.1	3.3	4.1	3.9	3.8	4.1	3.5	2.7	1.9	2.6	2.6	2.7	2.1	1.8		
MAX	8.4	9.1	8.5	6.4	9.9	5.7	7.2	9.7	12.3	13.2	13.8	14.2	15.0	14.3	14.1	14.5	14.4	14.6	12.7	11.5	8.9	8.4	9.3	7.9		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE: 6.1
MINIMUM: 1.1
MAXIMUM: 15.0
OBSERVATIONS: 742
% DATA RECOVERY: 99.7

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 06/ 1 /92
TO: 06/ 30 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	4.4	3.0	3.0	2.6	2.7	2.5	1.9	3.4	3.5	3.2	4.2	4.8	5.3	5.8	6.1	5.3	5.8	5.0	3.9	3.0	6.2	4.1	2.1	1.6	3.9	24
2	2.6	2.8	1.8	3.5	2.9	1.7	2.9	3.8	4.4	3.7	3.5	4.7	4.5	4.2	3.4	12.7	10.7	6.1	6.7	10.1	7.6	9.7	4.6	5.5	5.2	24
3	3.4	5.4	4.8	3.9	3.8	4.8	4.3	5.0	6.2	6.3	8.3	10.7	10.9	11.1	10.2	8.5	8.3	9.6	7.8	7.0	7.1	7.7	8.1	8.7	7.2	24
4	8.2	6.8	6.4	6.6	6.9	6.1	5.9	5.5	7.9	9.1	9.0	8.8	11.6	12.2	11.7	11.1	11.3	10.1	8.4	6.0	4.7	4.1	5.9	6.5	8.0	24
5	6.3	6.0	6.4	7.3	6.3	7.0	7.3	9.7	10.8	10.8	11.7	7.9	8.1	13.0	12.7	11.8	9.6	9.5	8.4	6.8	7.1	4.4	5.6	5.7	8.3	24
6	5.9	6.3	6.1	6.3	4.2	3.8	3.8	4.6	6.1	5.4	3.8	4.2	6.4	11.0	15.3	5.7	3.0	4.2	5.0	4.3	7.2	5.7	6.3	4.5	5.8	24
7	2.5	3.4	3.4	3.2	3.5	3.3	4.4	4.5	2.4	3.3	7.9	7.7	7.2	7.1	11.2	11.5	9.3	7.8	7.9	2.7	6.4	3.7	2.7	3.0	5.4	24
8	2.9	2.7	3.5	2.9	2.7	2.4	4.0	3.3	4.6	7.7	8.2	7.5	8.3	8.2	10.1	14.4	11.5	9.8	7.9	2.9	2.6	2.1	2.7	3.0	5.7	24
9	3.8	3.0	3.3	2.8	2.2	2.4	2.6	6.3	8.4	7.9	7.3	7.3	7.5	7.2	6.9	7.6	11.0	7.7	6.3	5.0	6.8	2.9	4.3	3.8	5.6	24
10	3.8	3.8	4.0	3.6	3.4	3.0	3.3	4.7	3.9	4.3	4.9	5.5	4.5	5.5	6.6	8.4	7.9	7.1	7.7	6.3	5.5	5.2	3.9	3.9	5.0	24
11	2.2	2.7	3.2	1.8	3.0	3.2	3.8	5.3	5.8	5.6	5.1	4.9	6.2	6.0	6.5	8.0	7.4	7.3	6.4	4.5	2.3	3.4	3.7	3.9	4.7	24
12	4.4	2.8	1.7	2.9	3.8	4.7	4.8	6.3	6.2	6.9	6.9	7.8	7.9	8.1	9.9	11.1	8.7	8.0	6.2	4.5	7.9	5.8	4.3	4.9	6.1	24
13	4.9	4.6	3.8	3.5	4.5	3.9	5.6	6.2	5.5	6.5	6.0	6.3	7.4	8.0	11.4	9.1	6.5	6.3	10.5	8.3	6.4	5.7	4.1	3.1	6.2	24
14	4.0	5.7	8.6	6.6	5.4	3.4	3.9	5.4	6.4	8.7	9.5	9.4	11.9	11.5	11.1	11.1	13.1	9.9	5.8	3.4	3.2	2.7	3.7	2.2	6.9	24
15	4.6	3.7	2.4	2.1	3.3	3.3	3.3	5.0	6.8	10.3	9.0	8.2	7.5	5.8	4.1	5.8	7.7	6.1	5.0	8.8	8.9	9.0	6.6	6.4	6.0	24
16	4.0	5.0	4.0	3.0	2.5	2.5	3.5	3.0	7.0	7.0	6.0	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	4.3	11
17	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
18	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
19	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
20	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
21	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
22	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	999.9	0
23	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	4.6	8.2	9.1	6.2	9.1	12.5	9.6	6.2	8.2	8
24	4.1	5.9	8.9	8.0	4.7	4.1	3.9	2.9	6.9	7.5	5.7	5.9	6.5	7.3	5.4	8.2	12.0	10.0	7.7	6.0	5.1	3.2	2.6	3.3	6.1	24
25	2.0	2.8	5.5	3.5	4.5	4.9	6.3	8.0	99.9	99.9	99.9	6.7	5.0	14.1	19.5	22.3	13.5	13.0	13.7	12.5	16.0	22.7	15.7	14.7	10.8	21
26	13.9	11.0	12.3	11.8	9.8	11.0	10.7	7.8	14.0	13.5	12.9	15.5	11.5	10.7	10.8	10.4	9.4	9.6	7.7	7.9	5.7	4.2	5.7	5.8	10.1	24
27	4.8	6.4	5.4	4.1	4.3	3.9	5.0	6.5	9.1	11.6	12.7	7.0	7.4	6.1	3.6	7.9	7.7	4.4	2.6	5.6	5.6	6.5	7.6	7.3	6.4	24
28	5.0	4.5	5.3	5.6	5.2	5.3	6.4	7.8	12.1	6.5	6.7	8.8	7.2	10.6	11.2	11.7	9.8	7.5	7.3	6.6	8.3	5.1	6.0	5.0	7.3	24
29	6.7	7.3	8.2	7.1	7.9	5.8	99.9	99.9	9.0	9.2	9.3	11.5	12.1	12.4	12.7	4.2	3.9	2.8	2.6	5.7	5.9	4.2	4.9	6.5	7.3	22
30	6.5	4.6	7.0	7.3	6.3	6.0	5.4	7.1	7.4	10.2	11.3	6.2	9.7	11.8	10.3	10.4	11.8	9.9	6.1	3.2	3.2	3.8	3.4	4.0	7.2	24
AVG	4.8	4.8	5.2	4.8	4.5	4.3	4.7	5.6	7.0	7.5	7.7	7.6	7.9	9.0	9.6	9.9	8.9	7.8	7.0	6.0	6.5	6.0	5.4	5.2		
MIN	2.0	2.7	1.7	1.8	2.2	1.7	1.9	2.9	2.4	3.2	3.5	4.2	4.5	4.2	3.4	4.2	3.0	2.8	2.6	2.7	2.3	2.1	2.1	1.6		
MAX	13.9	11.0	12.3	11.8	9.8	11.0	10.7	9.7	14.0	13.5	12.9	15.5	12.1	14.1	19.5	22.3	13.5	13.0	13.7	12.5	16.0	22.7	15.7	14.7		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	6.5
MINIMUM:	1.6
MAXIMUM:	22.7
OBSERVATIONS:	542
% DATA RECOVERY:	75.3

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 07/-1-/92
TO: 07/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	3.8	3.9	2.9	3.4	3.8	3.9	4.1	6.6	9.2	9.4	9.1	9.1	8.1	8.7	8.3	6.9	6.8	5.4	4.3	4.4	4.0	3.5	2.5	2.3	5.6	24
2	2.0	2.1	2.7	1.2	2.2	2.0	2.4	3.4	4.6	4.9	6.0	4.6	4.8	4.5	4.3	3.9	2.2	3.0	3.5	4.4	4.1	3.5	3.7	3.6	3.5	24
3	3.2	1.8	1.7	2.3	2.8	2.5	3.4	5.3	6.4	5.9	5.4	5.9	6.3	7.1	7.8	7.9	6.2	5.0	4.8	4.3	5.3	4.7	4.0	3.4	4.7	24
4	5.0	6.2	7.1	6.4	6.1	4.7	4.1	6.6	8.6	7.8	7.9	7.0	7.0	6.9	6.1	6.4	6.2	3.7	4.1	3.2	4.2	4.4	3.4	3.0	5.7	24
5	2.2	1.9	2.1	1.5	3.2	3.1	3.2	3.0	3.4	5.3	4.4	4.3	4.5	5.3	4.5	3.9	4.5	3.9	2.5	2.2	3.8	4.5	4.1	3.2	3.5	24
6	3.2	3.0	2.9	2.6	1.4	0.7	1.1	2.1	2.2	3.0	3.1	5.3	6.2	6.4	6.5	7.4	8.1	7.2	5.4	5.9	4.9	4.3	7.2	7.6	4.5	24
7	6.5	6.4	4.0	4.3	2.9	2.9	1.6	3.0	3.6	3.8	3.8	4.4	4.6	5.3	5.1	12.4	6.1	6.4	4.9	3.8	5.1	4.0	2.9	2.5	4.6	24
8	2.0	2.5	2.2	2.6	2.4	1.8	2.2	1.0	2.3	4.8	4.5	4.5	3.9	3.6	4.2	3.6	3.0	5.5	6.7	3.3	3.0	3.6	2.8	1.7	3.2	24
9	1.7	4.1	2.9	2.0	3.7	3.6	3.6	3.9	4.7	4.3	3.8	2.9	3.1	3.1	2.8	3.3	3.9	5.1	3.2	3.0	2.0	4.6	5.6	4.3	3.5	24
10	4.8	7.0	3.8	3.4	2.7	1.6	1.4	2.5	3.2	3.4	4.1	4.4	3.6	4.5	2.8	3.3	5.7	99.9	6.9	4.0	4.0	3.6	3.7	1.5	3.7	23
11	4.3	2.4	3.1	2.4	1.5	1.4	1.3	1.1	1.8	3.8	4.1	3.6	4.7	5.1	4.3	5.2	5.6	4.7	7.0	8.0	4.5	3.2	0.7	3.2	3.6	24
12	2.9	3.0	3.4	2.5	3.3	3.0	2.2	2.4	4.7	7.4	5.2	3.3	4.4	3.9	3.1	3.2	9.7	9.5	4.2	3.0	2.9	4.1	3.9	2.7	4.1	24
13	1.9	2.6	2.2	1.6	1.6	2.2	2.1	2.1	4.0	6.0	4.8	4.2	3.6	6.0	8.8	7.1	9.5	3.7	3.0	1.5	2.7	1.6	1.5	1.5	3.6	24
14	2.4	2.5	2.6	3.3	2.3	3.2	2.4	3.8	4.2	4.1	3.4	3.4	3.0	2.6	3.0	2.7	6.2	9.4	10.7	9.3	3.0	4.0	4.7	4.3	4.2	24
15	3.9	2.3	2.3	3.1	1.6	1.7	2.2	3.8	6.6	6.0	5.0	4.2	3.8	3.6	4.3	2.9	10.4	12.9	6.0	3.4	3.4	5.5	2.6	3.5	4.4	24
16	2.5	1.0	1.3	2.5	3.9	4.5	5.2	5.7	7.2	7.9	8.5	8.0	8.5	9.2	8.6	6.9	3.9	7.6	4.4	6.8	4.8	3.7	2.3	2.1	5.3	24
17	2.5	2.2	2.6	3.2	2.1	2.0	2.7	4.2	6.6	6.3	5.9	5.3	4.9	4.5	5.3	8.3	7.5	7.2	9.2	5.1	3.5	3.6	3.2	3.9	4.7	24
18	2.5	1.8	3.1	3.6	3.2	2.1	2.3	4.3	5.7	4.3	4.7	4.7	4.9	4.3	4.0	2.8	10.9	9.2	5.1	3.4	2.7	99.9	99.9	2.5	4.2	22
19	1.5	1.6	2.0	1.9	2.7	3.2	3.6	2.9	3.2	4.5	3.6	3.1	2.5	3.5	11.7	4.9	6.0	4.5	2.5	1.8	2.3	1.6	1.9	1.2	3.3	24
20	1.2	1.4	2.1	2.8	3.4	3.3	3.5	5.1	6.4	6.5	5.7	5.1	6.9	6.1	9.2	10.0	8.3	6.1	3.4	2.4	3.1	3.6	2.5	3.2	4.6	24
21	2.6	2.8	3.1	2.0	1.9	2.5	2.9	3.2	4.0	5.8	5.6	5.7	6.2	6.4	10.7	10.4	5.2	5.5	3.0	3.6	1.2	1.8	2.3	2.5	4.2	24
22	1.8	2.4	2.9	1.6	2.6	3.4	3.8	4.4	6.5	8.2	7.9	5.7	5.3	5.0	4.9	11.1	14.2	11.5	6.9	3.6	2.5	4.6	5.0	3.7	5.4	24
23	4.7	4.2	2.7	2.9	2.5	4.0	3.9	5.7	8.8	7.9	6.4	5.9	4.1	4.5	8.8	3.4	4.8	3.9	4.7	3.3	3.4	2.8	3.8	2.8	4.6	24
24	3.2	4.1	4.0	4.7	3.6	3.1	3.3	5.6	8.5	11.0	8.9	5.3	4.0	5.9	4.8	6.3	3.9	6.4	3.0	2.2	0.8	1.7	1.9	2.4	4.5	24
25	3.5	4.1	4.0	2.7	2.6	3.1	3.0	4.2	6.2	6.4	5.2	5.1	4.4	2.4	2.7	2.5	5.0	2.4	1.6	2.5	4.5	3.8	1.7	2.6	3.6	24
26	3.3	1.4	2.2	2.0	1.2	1.9	1.8	2.2	3.3	4.0	3.6	3.0	3.1	3.8	3.7	2.8	3.2	1.8	4.8	4.2	4.6	2.3	1.0	0.8	2.8	24
27	1.3	1.1	2.2	2.7	1.7	1.9	1.3	0.7	2.0	2.3	3.7	4.6	4.9	5.4	5.4	6.0	5.7	6.5	5.7	5.0	4.7	4.9	3.9	3.7	3.6	24
28	1.7	3.3	2.0	0.9	1.1	1.3	0.9	2.2	4.1	4.3	4.1	5.2	6.1	7.4	6.7	6.2	6.8	6.4	6.5	5.8	6.0	5.0	4.7	4.1	4.3	24
29	2.9	2.5	1.6	2.4	3.0	2.8	1.2	1.5	2.2	4.1	4.5	4.9	4.9	4.4	5.0	5.5	5.6	6.3	5.8	5.8	4.8	3.8	3.3	5.1	3.9	24
30	2.3	2.7	1.5	1.1	1.6	2.4	1.9	1.5	2.8	3.1	3.8	3.8	4.8	16.9	7.4	2.9	3.6	3.5	2.7	2.5	2.3	1.9	3.0	3.5	3.5	24
31	4.0	3.1	2.9	1.7	2.1	2.2	1.0	1.2	2.9	4.1	3.9	4.4	3.8	5.0	8.5	7.2	3.9	2.7	2.7	4.8	4.1	2.3	2.3	1.5	3.4	24
AVG	2.9	2.9	2.8	2.6	2.6	2.6	2.6	3.4	4.8	5.5	5.2	4.9	4.9	5.5	5.9	5.7	6.2	5.9	4.8	4.1	3.6	3.6	3.2	3.0		
MIN	1.2	1.0	1.3	0.9	1.1	0.7	0.9	0.7	1.8	2.3	3.1	2.9	2.5	2.4	2.7	2.5	2.2	1.8	1.6	1.5	0.8	1.6	0.7	0.8		
MAX	6.5	7.0	7.1	6.4	6.1	4.7	5.2	6.6	9.2	11.0	9.1	9.1	8.5	16.9	11.7	12.4	14.2	12.9	10.7	9.3	6.0	5.5	7.2	7.6		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	4.1
MINIMUM:	0.7
MAXIMUM:	16.9
OBSERVATIONS:	741
% DATA RECOVERY:	99.6

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 08/ 1 /92
TO: 08/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	2.4	3.0	3.8	2.9	2.8	2.3	1.1	1.5	3.6	4.9	3.4	3.4	4.5	8.2	6.7	7.9	8.0	6.0	4.5	10.6	3.7	3.5	1.8	2.4	4.3	24
2	3.9	3.2	1.9	3.7	3.7	2.5	1.1	1.3	2.3	2.4	2.8	2.4	3.0	4.3	4.1	13.2	9.0	6.1	4.9	4.5	3.1	3.0	1.8	5.8	3.9	24
3	4.2	2.9	2.5	2.3	1.9	1.7	2.1	1.9	4.8	5.0	4.7	5.1	8.7	6.5	4.8	4.8	5.3	4.6	10.2	8.5	5.2	4.5	4.0	4.1	4.6	24
4	3.9	3.8	3.4	2.6	2.7	2.2	3.2	3.8	3.6	4.0	3.0	3.1	3.2	9.9	5.8	4.0	3.6	4.1	4.7	4.4	3.2	3.7	3.4	4.5	3.9	24
5	4.6	3.7	3.2	2.1	1.4	0.6	1.4	1.8	2.3	2.7	3.1	3.9	6.0	12.3	7.0	3.6	4.9	3.0	2.8	0.8	3.4	2.9	2.6	2.9	3.5	24
6	2.0	1.9	2.4	1.5	1.9	1.7	1.9	2.7	2.8	3.0	99.9	99.9	4.2	4.1	4.3	14.5	9.2	6.4	3.1	3.5	4.3	4.3	3.9	4.6	4.0	22
7	3.4	4.3	4.2	5.3	4.3	4.0	4.0	5.4	4.2	4.2	3.8	4.0	8.1	8.6	3.9	3.3	3.2	3.3	2.7	3.4	4.6	3.9	2.5	3.1	4.2	24
8	3.8	6.1	5.5	5.0	3.0	2.5	3.5	4.5	4.3	5.3	5.4	5.3	5.3	4.6	14.1	6.6	4.1	4.5	5.2	4.0	5.1	4.2	3.4	1.6	4.9	24
9	2.6	3.2	3.8	2.5	4.1	2.6	3.4	3.0	3.0	3.0	3.8	3.7	4.7	5.3	5.4	12.4	7.8	7.8	3.6	5.9	3.5	2.7	3.6	4.7	4.4	24
10	3.9	1.8	1.9	1.7	3.1	2.6	2.0	2.2	2.6	3.0	99.9	3.8	4.3	3.7	4.0	3.2	3.3	2.8	6.5	11.1	2.6	3.4	2.6	2.9	3.4	23
11	2.0	2.1	2.6	3.3	3.3	3.5	3.5	5.3	6.0	7.2	6.9	6.5	6.2	5.7	7.3	16.2	5.7	3.4	3.0	2.6	2.7	4.0	4.4	4.2	4.9	24
12	3.4	3.6	4.2	3.5	3.1	3.5	4.5	6.3	8.5	8.2	9.3	8.5	9.5	9.7	4.6	4.0	9.1	8.0	8.1	6.9	4.6	4.2	3.0	3.4	5.9	24
13	2.8	4.6	4.2	3.4	3.3	3.4	2.9	4.5	7.7	9.5	9.8	10.2	9.9	8.3	7.5	6.3	7.2	8.5	4.9	5.9	4.6	3.7	2.3	2.6	5.8	24
14	4.6	4.7	6.2	4.8	3.8	3.3	4.3	5.2	6.7	8.2	9.2	9.0	9.9	10.9	8.7	5.7	8.5	8.7	4.0	2.6	3.3	4.0	6.0	6.2	6.2	24
15	3.3	3.0	2.0	3.3	4.7	5.0	4.9	3.8	5.1	7.5	8.8	7.7	8.5	8.4	8.3	6.0	5.3	9.0	5.1	2.5	2.8	5.9	4.2	3.9	5.4	24
16	4.4	2.4	1.8	3.5	3.6	4.7	4.2	4.5	6.2	5.5	5.8	6.1	5.2	11.1	8.2	9.8	7.2	8.8	3.7	5.1	4.9	3.6	3.3	3.2	5.3	24
17	3.0	4.2	3.2	2.1	1.9	3.5	3.4	3.3	4.8	6.2	5.6	4.0	5.2	4.6	4.0	3.5	4.7	8.1	5.3	4.1	5.0	5.2	4.4	5.0	4.3	24
18	2.7	2.8	1.3	2.1	2.2	2.0	2.7	4.2	3.8	3.3	2.6	3.1	4.2	3.5	2.9	2.9	3.1	2.7	3.1	5.5	6.0	7.4	6.8	6.4	3.6	24
19	6.1	5.8	4.2	2.0	2.3	2.3	3.1	2.2	3.9	4.1	3.3	3.2	4.5	4.7	4.3	5.2	3.9	11.8	11.6	5.7	2.1	3.9	4.5	3.8	4.5	24
20	3.5	3.4	4.1	2.6	1.6	2.7	1.4	2.6	3.2	2.5	3.1	3.5	3.9	5.2	6.2	2.6	4.5	5.7	7.7	5.9	3.3	5.5	3.6	2.1	3.8	24
21	2.3	2.0	2.7	2.2	2.1	2.1	2.6	3.7	2.7	3.2	3.8	6.4	9.8	10.9	11.8	13.8	12.4	8.9	5.4	3.1	1.5	2.0	2.4	2.6	5.0	24
22	3.5	5.5	4.7	5.7	5.6	5.3	4.9	6.3	7.0	8.2	8.0	7.7	6.4	5.9	5.4	10.1	11.1	5.2	4.9	3.6	2.6	4.4	3.6	1.5	5.7	24
23	2.8	3.0	4.1	4.2	3.8	3.5	3.0	4.8	7.5	9.2	9.9	9.5	13.3	7.7	7.9	5.4	4.6	4.3	4.5	4.3	4.3	5.3	7.5	7.4	5.9	24
24	8.2	8.1	9.4	10.5	10.3	10.4	12.0	13.1	13.1	13.7	19.4	12.7	13.5	15.7	15.7	15.4	13.7	13.7	12.2	12.3	10.0	9.2	7.6	6.5	11.9	24
25	7.1	6.8	8.0	5.2	5.4	4.8	4.1	6.7	10.1	11.1	10.9	11.1	8.9	8.6	7.9	8.8	8.1	7.4	6.1	5.5	4.9	5.7	4.4	3.6	7.1	24
26	4.4	3.9	4.3	3.8	3.2	3.5	4.0	4.4	5.5	6.4	6.1	6.0	6.0	6.1	5.6	5.6	6.4	6.0	5.0	8.0	5.7	6.0	5.7	4.6	5.3	24
27	3.1	3.3	3.6	3.3	3.5	3.3	3.0	3.4	5.5	6.7	5.8	4.7	5.0	5.5	4.0	4.5	4.8	6.3	7.3	5.7	4.8	3.4	4.9	4.2	4.6	24
28	4.7	3.2	4.2	4.6	6.0	4.2	3.4	6.5	7.9	9.0	9.9	10.8	6.9	2.9	8.6	3.5	4.7	7.3	7.2	5.6	3.5	4.5	5.3	4.6	5.8	24
29	4.1	3.5	3.7	4.0	4.0	4.9	5.0	5.4	6.5	6.5	7.9	11.7	9.6	9.7	8.2	9.0	5.1	4.5	3.6	4.0	4.4	3.9	3.0	3.1	5.6	24
30	4.6	4.2	3.6	4.4	3.0	2.0	2.8	3.0	1.7	4.1	4.0	3.5	4.1	5.1	5.4	8.1	4.8	4.0	5.2	3.6	3.8	3.1	4.2	2.5	3.9	24
31	2.4	2.2	1.2	1.8	1.7	2.1	2.0	2.7	2.3	2.8	3.3	2.8	4.3	4.6	3.6	2.7	4.6	2.9	5.4	5.7	4.1	3.7	3.0	2.0	3.1	24
AVG	3.8	3.7	3.7	3.5	3.5	3.3	3.4	4.2	5.1	5.8	6.3	6.1	6.7	7.2	6.7	7.2	6.4	6.3	5.5	5.3	4.1	4.3	4.0	3.9		
MIN	2.0	1.8	1.2	1.5	1.4	0.6	1.1	1.3	1.7	2.4	2.6	2.4	3.0	2.9	2.9	2.6	3.1	2.7	2.7	0.8	1.5	2.0	1.8	1.5		
MAX	8.2	8.1	9.4	10.5	10.3	10.4	12.0	13.1	13.1	13.7	19.4	12.7	13.5	15.7	15.7	16.2	13.7	13.7	12.2	12.3	10.0	9.2	7.6	7.4		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE: 5.0
MINIMUM: 0.6
MAXIMUM: 19.4
OBSERVATIONS: 741
% DATA RECOVERY: 99.6

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 09/ 1 /92
TO: 09/ 30 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	2.0	3.1	2.7	3.0	2.4	2.9	3.1	3.4	3.5	4.4	3.6	4.0	4.4	3.1	4.6	11.6	16.1	9.7	4.6	5.3	5.0	6.0	2.6	3.0	4.8	24
2	2.5	3.2	2.8	3.8	3.9	4.0	4.3	5.5	8.0	9.2	9.4	10.7	8.7	9.3	9.3	9.2	10.6	7.2	2.5	5.9	6.5	6.9	3.6	3.0	6.3	24
3	3.9	3.8	3.7	4.0	4.4	4.0	4.4	5.2	6.2	9.0	7.9	7.8	6.8	14.3	4.5	3.9	5.4	4.0	3.4	3.1	5.7	5.2	3.3	3.2	5.3	24
4	3.6	4.0	3.6	3.7	4.3	4.4	4.8	5.4	7.5	9.4	10.1	8.3	5.8	10.2	7.8	8.7	8.6	5.8	7.4	6.9	2.9	2.6	3.4	4.5	6.0	24
5	4.0	5.5	5.0	3.9	3.8	4.3	3.8	5.7	7.8	9.5	9.2	9.2	7.2	6.1	7.5	6.8	6.3	9.6	5.1	4.3	5.4	6.5	6.4	5.4	6.2	24
6	5.3	5.1	4.9	4.4	3.4	3.0	3.4	3.7	5.8	7.8	8.1	8.6	8.0	7.0	5.0	8.6	2.7	4.1	3.9	3.8	4.2	3.9	4.4	4.6	5.2	24
7	4.6	4.4	4.4	4.1	3.8	3.4	3.5	4.5	5.8	6.9	6.5	6.6	4.9	6.8	11.0	10.5	10.3	9.7	5.4	4.6	4.9	4.7	5.1	3.6	5.8	24
8	3.0	3.5	2.4	2.8	2.9	4.3	3.4	4.0	4.9	5.3	6.0	6.2	5.0	8.2	8.7	12.1	10.0	9.7	5.3	4.2	3.8	5.0	4.8	4.1	5.4	24
9	3.3	3.5	2.8	2.6	3.4	2.9	3.3	3.9	5.3	5.1	4.1	4.2	4.4	4.4	3.6	5.4	9.3	6.0	5.1	4.5	4.8	4.5	4.2	4.3	4.4	24
10	4.3	3.6	2.7	3.9	3.0	3.5	4.0	3.8	4.5	6.0	5.6	4.4	8.2	5.8	4.8	2.9	3.5	2.9	3.3	5.6	6.0	3.5	2.8	2.0	4.2	24
11	3.1	2.7	4.3	2.9	2.5	2.5	2.4	2.0	3.4	4.2	6.7	7.1	6.3	5.9	4.2	4.0	9.1	5.5	3.7	3.7	2.3	3.0	3.4	3.6	4.1	24
12	3.8	2.0	2.5	2.0	2.0	3.0	4.8	5.2	8.8	8.7	7.0	4.6	5.8	5.1	7.0	6.7	9.9	12.0	8.1	4.8	5.5	2.9	1.5	2.7	5.3	24
13	3.0	3.9	2.7	3.3	3.1	3.8	3.5	5.3	8.5	9.8	9.7	8.9	6.9	7.7	10.5	10.7	15.5	6.0	4.2	3.2	6.4	6.9	7.4	6.7	6.6	24
14	6.9	5.0	5.0	3.5	5.3	5.6	6.9	8.2	11.6	12.0	12.5	13.8	11.8	12.8	12.0	12.8	9.8	7.7	8.4	5.7	5.3	5.2	4.8	3.8	8.2	24
15	3.2	3.1	3.4	4.1	4.7	3.8	4.3	5.1	8.3	9.4	8.4	7.8	7.2	6.9	6.8	8.1	10.1	4.3	4.1	3.5	2.8	3.7	4.8	4.3	5.5	24
16	4.2	4.1	2.8	3.1	3.4	2.9	3.9	4.5	6.5	7.7	6.8	5.7	6.3	6.8	9.1	9.4	8.9	5.5	3.1	3.8	5.4	4.3	3.5	4.1	5.2	24
17	4.6	4.5	3.3	2.9	3.2	3.0	3.5	5.7	7.7	9.2	9.3	13.8	10.5	10.6	11.2	10.7	10.8	9.3	6.8	3.4	4.2	3.2	4.1	3.4	6.6	24
18	2.9	3.2	3.0	4.0	3.8	4.7	3.9	4.7	5.1	5.7	6.3	7.1	5.7	4.1	5.9	8.2	8.0	9.2	8.2	4.8	7.5	4.1	5.6	1.8	5.3	24
19	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	2.1	2.9	3.0	3.3	2.6	3.4	3.6	3.5	3.7	5.1	6.4	8.0	3.9	2.5	3.2	2.5	2.7	24
20	4.0	3.2	2.5	2.3	3.5	3.3	1.0	2.7	2.3	2.6	3.2	3.4	3.7	3.4	4.0	3.2	2.8	2.0	3.8	7.3	3.9	4.0	3.5	4.6	3.3	24
21	3.5	2.7	3.3	2.7	2.8	2.4	2.1	2.8	2.8	3.1	3.2	3.9	3.5	3.9	3.5	3.2	3.4	4.1	5.1	8.9	8.1	7.5	4.2	4.0	3.9	24
22	3.8	2.5	3.0	2.1	3.0	2.5	2.7	3.4	4.0	4.8	4.1	4.1	4.1	3.7	4.7	5.4	6.8	4.4	4.4	2.3	2.2	5.2	4.1	3.7	3.8	24
23	3.6	2.4	3.9	3.5	3.3	2.9	2.6	1.9	2.8	4.2	2.8	2.5	3.2	3.1	3.8	3.9	5.8	5.9	3.2	3.0	4.0	2.3	2.7	3.8	3.4	24
24	3.2	1.0	3.0	3.4	3.9	2.7	3.9	4.8	7.3	8.4	99.9	9.6	9.7	10.9	12.6	11.3	9.6	6.9	3.2	5.4	3.7	4.6	4.7	3.8	6.0	23
25	3.9	4.3	4.3	4.7	5.2	4.6	4.9	6.2	7.4	9.1	9.1	8.3	8.6	9.2	8.7	9.8	4.5	4.3	6.5	7.0	6.2	6.2	7.0	6.3	6.5	24
26	4.3	4.9	4.8	4.5	3.4	3.1	3.2	4.7	10.1	12.2	12.4	11.5	11.0	10.5	10.7	9.6	9.2	7.1	6.4	6.0	5.1	4.6	5.6	3.9	7.0	24
27	4.8	6.2	7.6	6.4	5.5	2.4	2.6	3.1	4.0	6.5	7.7	7.9	7.8	8.9	8.4	7.5	8.0	6.8	5.2	5.2	6.7	3.3	3.0	3.3	5.8	24
28	3.4	4.5	4.6	5.9	4.9	6.6	6.3	7.3	8.7	6.9	7.6	8.6	8.9	8.8	9.3	5.5	8.9	7.3	8.0	6.0	4.3	3.1	3.3	5.2	6.4	24
29	4.6	5.0	5.1	5.8	4.9	4.9	4.3	5.2	6.0	6.1	6.0	6.8	6.9	6.9	7.7	8.8	6.9	7.7	5.6	7.5	7.0	6.8	5.3	4.6	6.1	24
30	4.2	4.3	4.8	5.5	4.7	3.8	4.3	6.4	7.7	11.8	12.2	11.2	9.8	9.9	10.3	10.6	11.0	11.4	10.1	8.3	8.2	8.0	7.0	6.5	8.0	24
AVG	3.7	3.7	3.7	3.6	3.6	3.5	3.7	4.5	6.1	7.3	7.2	7.3	6.8	7.3	7.4	7.8	8.2	6.7	5.3	5.2	5.1	4.7	4.3	4.0		
MIN	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	2.1	2.6	2.8	2.5	2.6	3.1	3.5	2.9	2.7	2.0	2.5	2.3	2.2	2.3	1.5	1.8		
MAX	6.9	6.2	7.6	6.4	5.5	6.6	6.9	8.2	11.6	12.2	12.5	13.8	11.8	14.3	12.6	12.8	16.1	12.0	10.1	8.9	8.2	8.0	7.4	6.7		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	5.4
MINIMUM:	0.6
MAXIMUM:	16.1
OBSERVATIONS:	719
% DATA RECOVERY:	99.9

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: WIND SPEED
METHOD: INSTRUMENTAL ELECT/MACHINE AVERAGE
UNITS: MILES PER HOUR

FROM: 10/ 1 /92
TO: 10/ 14 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	5.5	4.9	5.5	7.2	8.8	9.2	8.3	9.9	13.6	13.4	14.3	13.6	15.0	13.5	13.3	11.4	9.0	7.5	9.5	7.3	7.9	8.3	9.4	7.1	9.7	24
2	6.1	5.5	5.3	4.5	3.9	6.0	9.2	8.8	8.9	10.6	13.5	12.0	10.9	12.1	10.5	10.9	9.4	11.1	10.6	9.0	8.5	8.9	8.5	10.2	9.0	24
3	11.2	11.4	10.5	10.2	11.4	11.5	11.4	12.9	13.6	12.5	11.3	10.2	9.5	9.5	9.2	10.8	11.0	5.3	7.6	9.6	12.0	12.3	15.7	17.9	11.2	24
4	17.3	17.5	11.9	9.8	13.1	10.8	13.7	9.5	10.4	11.0	13.2	16.0	15.7	14.3	14.6	13.2	13.1	10.5	8.4	6.8	5.8	6.7	6.2	7.0	11.5	24
5	6.0	5.2	2.8	2.9	2.6	2.9	2.4	5.5	7.6	10.9	10.9	12.2	13.2	13.4	14.0	14.7	12.4	9.1	8.6	8.0	6.0	5.8	4.1	3.7	7.7	24
6	3.8	5.9	5.7	6.9	6.5	6.5	7.2	7.6	8.7	9.4	10.3	9.7	10.5	9.7	9.8	8.4	8.9	9.2	8.6	8.5	8.5	8.1	7.3	7.8	8.1	24
7	7.1	6.8	6.4	6.1	6.0	7.6	7.1	7.6	9.0	11.1	9.2	8.1	9.0	9.6	11.9	12.3	10.7	9.7	9.9	8.1	6.1	4.4	5.0	4.3	8.0	24
8	3.9	4.0	3.1	2.9	2.9	2.8	3.2	4.1	5.2	5.2	5.4	5.4	5.5	4.6	3.8	3.6	4.7	7.1	5.3	3.7	4.1	3.7	3.6	4.1	4.2	24
9	4.0	3.8	3.9	3.1	2.2	1.5	2.1	3.6	3.4	3.8	5.8	5.0	5.7	4.9	3.9	3.7	2.3	3.1	4.5	5.5	5.3	4.5	3.8	3.4	3.9	24
10	2.8	2.8	2.9	4.3	3.7	2.1	2.3	2.3	2.9	2.5	3.1	4.5	4.4	4.3	4.0	3.2	2.7	2.9	3.4	4.6	6.0	5.8	5.8	4.1	3.6	24
11	2.4	2.4	2.1	2.7	2.2	0.9	1.2	1.6	1.5	2.5	3.4	5.2	6.5	4.6	3.6	3.6	3.7	3.8	2.5	2.0	1.7	2.5	2.9	3.1	2.9	24
12	3.2	3.4	2.8	3.9	4.7	6.4	6.5	6.1	6.4	8.7	8.8	7.4	6.8	6.7	5.6	5.3	5.7	5.4	5.8	6.5	6.3	5.3	4.6	3.9	5.7	24
13	3.9	3.8	4.1	4.1	4.1	4.7	4.6	5.8	7.1	7.7	6.7	5.5	5.6	5.9	6.1	6.4	5.9	4.1	3.0	4.4	4.4	4.1	3.6	3.2	5.0	24
14	3.9	4.2	4.1	4.2	3.4	3.8	4.5	3.6	6.9	9.1	11.0	12.0	10.7	10.8	10.4	9.5	9.0	7.6	5.1	5.8	4.5	3.9	3.4	3.7	6.5	24
AVG	5.8	5.8	5.1	5.2	5.4	5.5	6.0	6.3	7.5	8.5	9.1	9.1	9.2	8.9	8.6	8.4	7.7	6.9	6.6	6.4	6.2	6.0	6.0	6.0		
MIN	2.4	2.4	2.1	2.7	2.2	0.9	1.2	1.6	1.5	2.5	3.1	4.5	4.4	4.3	3.6	3.2	2.3	2.9	2.5	2.0	1.7	2.5	2.9	3.1		
MAX	17.3	17.5	11.9	10.2	13.1	11.5	13.7	12.9	13.6	13.4	14.3	16.0	15.7	14.3	14.6	14.7	13.1	11.1	10.6	9.6	12.0	12.3	15.7	17.9		

99.9 Indicates missing data or calibration activities.

MONTHLY SUMMARY

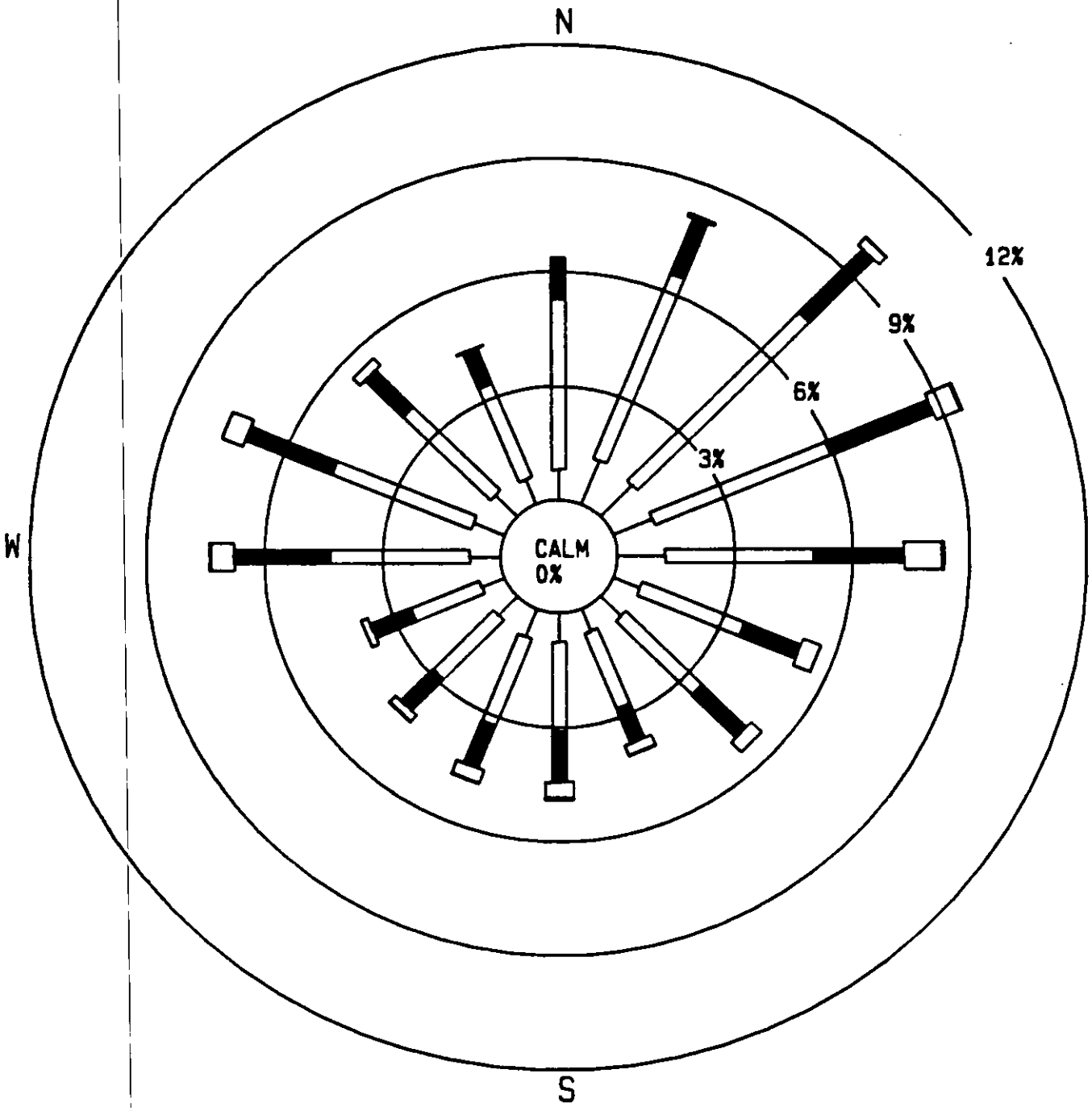
AVERAGE:	6.9
MINIMUM:	0.9
MAXIMUM:	17.9
OBSERVATIONS:	336
% DATA RECOVERY:	100.0

JOINT FREQUENCY DISTRIBUTION
HOMELAND FLORIDA
FLORIDA POWER CORPORATION - POLK COUNTY SITE
OCTOBER 15 1991 - OCTOBER 14 1992

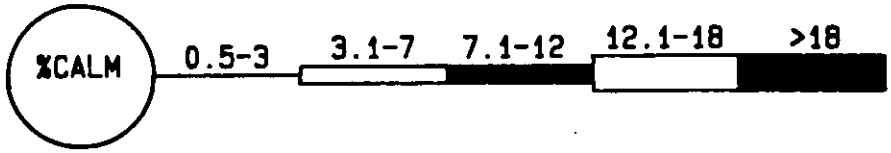
DIRECTION	.5-3MPH	3.1-7MPH	7.1-12MPH	12.1-18MPH	18.1-24MPH	24.1-32MPH	GT 32 MPH	TOTAL	AVG.SPEED
N	0.80	4.50	1.07	0.00	0.00	0.00	0.00	6.37	5.1
NNE	1.24	5.24	1.57	0.08	0.00	0.00	0.00	8.13	5.3
NE	1.15	6.23	2.32	0.28	0.01	0.00	0.00	10.00	5.8
ENE	1.08	4.87	2.82	0.68	0.05	0.00	0.00	9.50	6.6
E	1.21	3.80	2.30	0.98	0.05	0.00	0.00	8.33	6.9
ESE	0.73	2.82	1.54	0.47	0.01	0.00	0.00	5.57	6.6
SE	0.73	2.73	1.58	0.37	0.00	0.00	0.00	5.42	6.4
SSE	0.62	2.14	0.96	0.29	0.01	0.00	0.00	4.02	6.2
S	0.75	2.34	1.33	0.42	0.05	0.00	0.00	4.88	6.6
SSW	0.76	2.46	1.20	0.36	0.02	0.00	0.00	4.80	6.3
SW	0.68	2.18	1.15	0.23	0.01	0.00	0.00	4.25	6.2
WSW	0.62	1.89	1.10	0.20	0.00	0.00	0.00	3.80	6.0
W	0.77	3.54	2.44	0.61	0.02	0.00	0.00	7.38	7.0
WNW	0.85	3.81	2.38	0.57	0.00	0.00	0.00	7.61	6.5
NW	0.79	3.12	1.36	0.26	0.00	0.00	0.00	5.53	5.9
NNW	0.70	2.68	0.99	0.02	0.00	0.00	0.00	4.39	5.4
CALM								0.01	
TOTAL	13.48	54.36	26.10	5.81	0.23	0.00	0.00	100.00	6.2

NUMBER OF OBSERVATIONS: 8582

Units: Percent Joint Frequency Wind Speed vs Wind Direction



WIND SPEED CLASSES (MPH)



Florida Power
CORPORATION

POLK COUNTY SITE - HOMELAND, FL
WINDROSE
OCTOBER 15, 1991 - OCTOBER 14, 1992

10.5.6.3 Summary of On-Site Hourly Air Quality Monitoring Data (2/15/92 - 10/14/92)

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 02/ 15 /92
TO: 02/ 29 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
15	999	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	6	0	1	0	0	0.4	23
16	999	0	0	0	0	0	0	2	0	5	1	4	1	0	0	0	20	93	26	13	12	14	14	11	9.4	23
17	999	3	5	2	0	0	0	0	0	0	999	999	0	0	999	0	0	0	2	1	0	0	1	2	0.8	20
18	999	1	0	0	3	2	0	0	0	999	999	1	0	0	0	0	0	0	0	3	4	0	0	0	0.7	21
19	999	0	0	0	0	0	0	0	0	0	0	0	0	0	11	74	8	10	0	0	0	0	0	0	4.5	23
20	999	0	0	1	1	4	4	3	1	1	2	2	2	2	2	1	1	0	1	1	0	0	1	0	1.3	23
21	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
22	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
23	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0.1	23
24	999	0	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	1	0	0	0	0.0	21
25	999	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	5	4	0	0	1	0.5	23
26	999	0	0	0	0	0	0	0	0	2	5	4	10	21	20	18	4	10	7	6	10	11	5	2	5.9	23
27	999	0	1	2	0	4	1	0	0	3	2	2	2	8	9	6	15	8	0	0	0	2	1	13	3.4	23
28	999	10	7	1	2	5	7	4	1	1	2	1	2	4	6	9	4	3	3	2	1	6	0	2	3.6	23
29	999	1	2	0	0	1	0	0	7	7	0	0	1	1	1	1	1	0	0	3	9	10	3	5	2.3	23
AVG	999	1	1	0	0	1	1	1	1	1	1	1	1	3	4	7	4	8	3	3	3	3	2	2		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	10	7	2	3	5	7	4	7	7	5	4	10	21	20	74	20	93	26	13	12	14	14	13		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	2
MINIMUM:	0
MAXIMUM:	93
OBSERVATIONS:	338
% DATA RECOVERY:	93.9

EBASCO ENVIRONMENTAL — AIR QUALITY/METEOROLOGY DATA SUMMARY — 12-13-1992
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

STATE: FLORIDA: — POLLUTANT: SULFUR DIOXIDE — FROM: 03/ 1 /92
AGENCY: PRIVATE — METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE — TO: 03/ 31 /92
PROJECT: BACKGOUND SURVEILLANCE — UNITS: PARTS PER BILLION (VOL/VOL)

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	5	1	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	1	2	3	5	0.9	23
2	999	0	0	0	0	0	0	0	0	1	7	1	0	999	999	0	0	0	0	1	0	0	0	0	0.5	21
3	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
4	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
5	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
6	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0.2	23
7	999	0	0	0	0	0	0	0	0	0	0	5	2	6	23	71	75	49	4	10	24	5	10	7	12.7	23
8	999	0	0	1	0	3	0	4	6	4	4	1	0	1	2	2	2	2	2	10	11	2	2	0	2.6	23
9	999	0	0	0	0	0	0	0	0	3	0	0	999	999	0	0	0	0	6	38	29	0	0	0	3.6	21
10	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
11	999	10	7	5	1	1	0	0	0	1	2	4	3	2	2	0	2	1	0	0	1	4	4	3	2.3	23
12	999	2	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	3	4	4	5	2	1.2	23
13	999	1	2	5	8	3	1	2	1	51	72	999	999	999	999	0	0	0	0	0	1	0	0	0	7.7	19
14	999	2	2	6	2	2	1	0	0	0	1	1	1	2	3	2	1	11	16	24	6	6	2	4	4.1	23
15	999	5	4	7	11	6	1	0	0	0	0	0	0	0	0	0	0	3	2	3	11	0	5	1	2.6	23
16	999	0	4	1	0	0	1	0	0	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0.6	23
17	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
18	999	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0	0.0	21
19	999	0	0	0	6	0	0	2	1	0	0	0	0	0	11	10	2	5	12	4	0	1	6	12	3.1	23
20	999	0	0	0	0	0	4	10	2	1	0	0	0	0	0	0	1	8	3	1	1	0	0	3	1.5	23
21	999	0	0	0	0	0	0	0	1	3	2	1	1	1	1	1	1	0	0	0	2	5	3	1	1.0	23
22	999	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.1	23
23	999	0	0	0	0	0	0	0	0	5	8	999	999	1	2	0	0	0	0	0	0	0	0	0	0.8	21
24	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
25	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
26	999	0	0	0	0	0	0	7	6	1	1	0	0	0	0	0	0	0	0	0	3	3	5	8	1.5	23
27	999	14	10	2	1	0	0	0	1	8	6	999	999	2	1	2	4	8	9	16	9	6	6	3	5.1	21
28	999	4	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	23
29	999	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	2	4	7	3	0	0	0.9	23
30	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0.2	23
31	999	0	0	2	0	0	0	3	0	0	0	2	4	7	8	6	8	10	13	17	11	3	4	5	4.5	23
AVG	999	1	1	1	1	0	0	1	1	3	3	1	0	1	2	3	3	3	2	4	4	1	2	2		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	14	10	7	11	6	4	10	6	51	72	5	4	7	23	71	75	49	16	38	29	6	10	12		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	2
MINIMUM:	0
MAXIMUM:	75
OBSERVATIONS:	699
% DATA RECOVERY:	94.0

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 04/ 1 /92
TO: 04/ 30 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	2	1	3	1	1	0	0	12	5	4	23	37	13	2	5	11	19	0	0	0	4	3	3	6.5	23
2	999	3	9	5	1	0	2	4	3	0	0	999	999	999	0	0	0	1	0	1	0	1	3	1	1.7	20
3	999	4	0	0	0	0	0	2	3	2	2	2	2	1	1	1	0	1	0	0	0	0	1	7	1.3	23
4	999	1	0	0	0	0	0	0	2	1	1	0	3	2	4	10	11	15	8	16	8	0	0	0	3.6	23
5	999	9	0	5	1	4	6	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	23
6	999	0	0	0	0	0	0	0	999	999	999	1	1	1	1	1	1	1	1	0	0	0	0	0	0.4	20
7	999	0	0	0	1	1	1	0	999	999	999	0	0	0	0	0	999	999	0	0	0	0	0	0	0.2	18
8	999	0	0	0	0	0	0	999	999	999	2	1	1	0	0	0	0	0	1	0	0	0	0	3	0.4	20
9	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
10	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0	23
11	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
12	999	0	0	0	0	0	0	0	0	0	0	0	1	18	22	0	0	0	0	0	0	0	0	0	1.8	23
13	999	0	0	0	1	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	23
14	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
15	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
16	999	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0	0.0	21
17	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
18	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
19	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
20	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
21	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
22	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
23	999	0	0	0	0	0	0	0	0	0	999	999	999	999	999	999	999	999	999	999	999	999	999	999	0.0	9
24	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
25	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
26	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
27	999	999	999	999	999	999	999	999	999	999	999	999	999	0	0	0	0	0	0	2	5	0	6	1	1.3	11
28	999	10	6	5	0	0	3	4	2	2	3	2	0	0	0	0	1	1	0	1	1	1	4	3	2.1	23
29	999	2	2	2	5	5	3	9	2	1	1	1	1	1	1	1	0	0	1	1	2	5	2	1	2.1	23
30	999	1	1	0	2	0	0	0	1	1	1	1	2	4	6	4	5	8	5	7	15	21	7	4	4.2	23
AVG	999	1	1	1	0	0	1	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	10	9	5	5	5	6	9	12	5	4	23	37	18	22	10	11	19	8	16	15	21	7	7		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	1
MINIMUM:	0
MAXIMUM:	37
OBSERVATIONS:	579
% DATA RECOVERY:	80.4

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 05/ 1 /92
TO: 05/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	2	4	4	4	0	3	4	8	6	6	3	1	1	1	2	2	8	15	17	6	1	0	1	4.3	23
2	999	0	0	0	0	0	0	0	3	1	5	9	7	3	1	1	1	0	0	18	13	5	3	0	3.0	23
3	999	0	0	0	0	0	1	1	3	4	8	4	4	4	9	5	22	28	13	16	21	11	6	4	7.1	23
4	999	7	6	10	12	9	9	9	10	2	5	3	999	999	7	0	2	0	0	5	0	0	0	4	4.8	21
5	999	1	3	2	0	0	0	10	26	11	13	8	11	14	19	13	3	1	2	1	3	17	2	0	7.0	23
6	999	4	3	2	2	4	7	13	12	12	8	4	7	13	13	26	11	21	22	29	13	10	8	3	10.7	23
7	999	0	0	0	0	0	0	0	3	5	999	999	999	999	4	0	0	0	0	1	0	0	11	1	1.3	19
8	999	0	0	0	0	0	0	4	8	6	3	2	3	9	7	8	8	13	9	1	9	7	2	0	4.3	23
9	999	2	1	2	0	1	0	8	5	3	4	4	3	2	3	4	5	5	5	21	5	2	0	0	3.7	23
10	999	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	23
11	999	0	0	0	0	0	0	0	0	3	0	999	999	999	0	0	0	0	0	0	0	0	0	0	0.2	20
12	999	0	0	0	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	23
13	999	0	0	0	0	0	1	1	6	9	6	2	37	12	0	2	10	0	0	0	1	0	0	0	3.8	23
14	999	0	0	2	0	4	5	4	16	13	5	7	12	15	21	14	9	17	18	15	6	7	11	5	9.0	23
15	999	1	5	4	4	3	2	3	6	6	0	0	0	0	0	0	4	1	2	1	0	0	0	0	1.8	23
16	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
17	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
18	999	0	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0.0	21
19	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
20	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
21	999	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0	0	0.0	21
22	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
23	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
24	999	0	0	0	0	0	0	0	14	15	5	0	0	0	0	1	1	7	10	12	23	17	9	2	5.0	23
25	999	0	0	0	0	0	0	7	16	16	10	15	18	0	0	1	14	22	15	2	0	0	0	5	6.1	23
26	999	0	0	0	0	0	0	0	4	3	13	0	1	2	1	0	0	0	1	0	0	0	0	0	1.1	23
27	999	0	2	3	3	2	0	3	10	10	2	4	10	36	20	20	5	0	0	6	0	0	0	0	5.9	23
28	999	0	0	0	0	0	2	10	15	4	999	999	5	1	0	0	0	0	13	2	0	10	12	7	3.9	21
29	999	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	47	76	30	24	8	0	0	8.5	23
30	999	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0.4	23
31	999	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0.2	23
AVG	999	1	1	1	1	1	1	2	6	4	3	2	4	4	3	3	3	6	7	6	4	3	2	1		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	7	6	10	12	9	9	13	26	16	13	15	37	36	21	26	22	47	76	30	24	17	12	7		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	3
MINIMUM:	0
MAXIMUM:	76
OBSERVATIONS:	698
% DATA RECOVERY:	93.8

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 06/ 1 /92
TO: 06/ 30 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	1	3	6	6	2	0	0	0	0	3	5	5	0	0	1	5	49	31	9	5	7	7	3	6.4	23
2	999	4	3	2	1	0	0	0	0	4	5	4	3	3	4	0	0	0	0	0	0	0	0	0	1.4	23
3	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
4	999	0	0	0	0	0	0	0	6	0	999	999	999	999	39	13	0	0	0	0	0	0	0	0	3.1	19
5	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
6	999	3	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	23
7	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
8	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
9	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	0	0	0	0.3	23
10	999	0	0	0	0	0	0	0	6	4	26	52	37	13	13	18	5	1	0	0	0	0	0	0	7.6	23
11	999	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	5	0	0	0	0	0	0	0	0.5	23
12	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
13	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
14	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
15	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
16	999	999	999	999	999	999	999	999	999	999	999	999	999	0	0	0	0	0	999	999	999	999	999	999	0.0	5
17	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
18	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
19	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	1	1	8	6	0	0	0	2.3	7
20	0	3	0	0	0	0	0	6	12	14	7	4	4	2	5	15	17	2	14	7	2	0	0	0	4.8	24
21	0	0	0	0	0	2	0	2	0	0	5	3	10	4	0	0	0	2	0	0	0	0	2	0	1.3	24
22	0	0	0	0	0	0	0	1	0	0	0	0	0	0	16	17	7	12	11	28	24	2	0	0	4.9	24
23	0	0	0	0	0	0	0	0	2	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0.1	22
24	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	6	0	0	0	0	0	0.9	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	24
29	0	0	0	0	0	0	999	999	0	0	999	999	999	999	999	1	2	4	10	3	2	2	0	0	1.4	17
30	999	0	0	0	0	1	1	6	5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	23
AVG	0	1	0	0	0	1	0	1	1	1	2	3	3	1	4	3	2	4	3	3	2	0	0	0		
MIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	0	4	3	6	6	4	1	6	12	14	26	52	37	13	39	18	17	49	31	28	24	7	7	3		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	2
MINIMUM:	0
MAXIMUM:	52
OBSERVATIONS:	515
% DATA RECOVERY:	71.5

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 07/ 1 /92
TO: 07/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	2	12	14	3	32	37	4.5	23
2	999	13	5	4	5	5	3	2	1	1	1	1	999	999	1	1	1	1	1	5	3	2	1	0	2.7	21
3	999	1	0	0	0	0	1	0	0	8	3	1	3	2	0	0	0	1	0	0	4	5	5	4	1.7	23
4	999	1	1	0	1	3	1	4	0	0	0	1	0	0	2	1	2	1	0	0	1	1	0	0	0.9	23
5	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	4	0.4	23
6	999	1	0	0	0	0	0	0	10	11	999	999	55	44	22	43	29	12	14	15	6	8	1	0	12.9	21
7	999	5	0	0	0	0	0	2	9	4	7	13	12	25	3	3	3	7	5	2	0	0	0	0	4.3	23
8	999	0	0	0	0	0	0	8	9	1	3	0	1	0	0	0	0	4	6	5	4	3	3	1	2.1	23
9	999	1	0	0	1	0	0	1	10	4	10	5	3	2	1	0	0	0	0	0	0	0	0	0	1.7	23
10	999	1	0	0	0	0	0	1	3	11	12	7	3	2	2	1	0	999	0	0	1	3	0	0	2.1	22
11	999	0	0	0	0	0	0	0	8	15	14	11	7	3	1	0	0	0	0	0	0	0	0	0	2.6	23
12	999	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0.2	23
13	999	0	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0.0	21
14	999	0	0	0	0	0	0	0	0	7	4	0	0	1	1	0	5	17	5	0	0	0	0	0	1.7	23
15	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999	3	3	1	0	0	0	0.3	22
16	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
17	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
18	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999	999	0	0.0	21
19	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
20	999	0	0	0	0	0	0	0	0	999	999	999	0	0	0	999	0	0	0	0	0	0	0	0	0.0	19
21	999	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	1	5	8	3	1	1	0.9	21
22	999	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	23
23	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	6	1	0.8	23
24	999	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	2	0	0	1	3	2	3	3	0.8	23
25	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	6	3	0.8	23
26	999	3	2	1	1	2	1	1	0	3	2	1	1	4	5	5	6	6	7	8	5	4	1	2	3.1	23
27	999	4	4	0	0	0	1	3	17	28	27	31	49	44	23	5	9	14	33	29	13	9	3	11	15.5	23
28	999	4	4	3	2	3	5	5	8	7	10	19	28	23	7	14	51	51	33	33	4	0	3	8	14.1	23
29	999	9	13	4	6	3	1	7	26	10	2	7	8	15	27	43	46	47	33	9	12	2	3	1	14.5	23
30	999	0	0	0	0	0	0	0	0	6	9	5	10	2	2	10	4	3	5	3	0	0	0	0	2.6	23
31	999	0	0	0	0	0	0	3	15	999	28	22	28	26	6	0	0	1	2	3	4	2	2	1	6.5	22
AVG	999	2	1	0	1	1	0	1	4	4	5	4	7	7	3	4	5	6	5	4	3	2	2	2		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	13	13	4	6	5	5	8	26	28	28	31	55	44	27	43	51	51	33	33	14	11	32	37		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	3
MINIMUM:	0
MAXIMUM:	55
OBSERVATIONS:	696
% DATA RECOVERY:	93.5

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 08/ 1 /92
TO: 08/ 31 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	0	0	0	0	0	0	0	12	17	7	6	5	7	7	3	8	6	3	0	0	0	0	0	3.5	23
2	999	0	0	0	0	0	0	1	5	6	4	3	2	3	1	5	1	0	1	2	0	0	0	0	1.5	23
3	999	0	0	0	0	0	0	0	0	7	5	35	9	4	8	4	15	16	0	0	0	3	0	0	4.6	23
4	999	0	0	0	0	0	0	3	6	9	8	11	22	6	6	6	2	7	2	0	0	0	0	0	3.8	23
5	999	0	0	0	0	0	0	2	1	10	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0.8	23
6	999	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0	0	0.0	21
7	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0.2	23
8	999	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	3	2	0.4	23
9	999	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	0.3	23
10	999	0	0	0	0	0	0	0	0	0	0	2	1	0	6	16	32	26	11	0	0	1	0	0	4.1	23
11	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
12	999	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.1	23
13	999	0	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	1	0	0	0	0.0	21
14	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0.2	23
15	999	0	0	0	0	0	0	0	0	0	0	0	0	1	4	8	13	13	0	0	0	0	0	0	1.7	23
16	999	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.1	23
17	999	0	0	0	0	0	0	0	0	999	999	999	0	0	0	0	0	0	13	11	9	2	0	0	1.8	20
18	999	0	0	0	0	0	0	0	0	1	6	6	4	4	2	1	1	3	15	9	6	0	0	0	2.5	23
19	999	0	0	0	0	0	1	2	2	0	0	1	2	1	1	0	0	0	0	0	0	0	1	1	0.5	23
20	999	0	0	0	0	0	0	1	2	11	999	999	4	3	0	0	1	3	6	0	0	0	0	0	1.5	21
21	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
22	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
23	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
24	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
25	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
26	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
27	999	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	4	3	0	0	0	0	0.4	23
28	999	0	0	0	0	0	0	7	2	0	0	999	999	0	0	0	0	9	14	5	0	0	0	0	1.8	21
29	999	0	0	0	0	0	0	0	0	0	0	0	0	1	4	10	29	36	34	20	1	0	0	0	5.9	23
30	999	0	0	0	0	0	0	1	3	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0.3	23
31	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
AVG	999	0	0	0	0	0	0	1	1	2	1	3	2	1	1	2	3	4	3	2	1	0	0	0		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	1	0	0	0	0	1	7	12	17	8	35	22	7	8	16	32	36	34	20	9	3	3	2		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	1
MINIMUM:	0
MAXIMUM:	36
OBSERVATIONS:	702
% DATA RECOVERY:	94.4

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 09/ 1 /92
TO: 09/ 30 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
2	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
3	999	0	0	0	0	0	0	0	0	0	999	999	0	0	0	0	0	0	0	0	0	0	0	0	0.0	21
4	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
5	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
6	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
7	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
8	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
9	999	0	0	0	0	0	0	0	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	22
10	999	0	0	0	0	0	0	0	0	3	0	999	999	2	4	10	11	6	3	0	0	0	0	0	1.9	21
11	999	0	0	0	0	0	0	0	0	15	30	17	5	13	14	5	2	0	0	0	0	0	0	0	4.4	23
12	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
13	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
14	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
15	999	0	0	0	0	0	0	0	0	999	999	999	999	999	0	0	0	0	0	0	0	0	0	0	0.0	18
16	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
17	999	0	0	0	0	0	0	0	0	0	0	16	999	999	0	0	0	0	0	0	0	0	0	0	0.8	21
18	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	3	4	0.7	23
19	999	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	3	0	0	0	0	0	0.6	23
20	999	0	0	0	0	0	0	0	0	0	1	0	0	3	2	1	1	0	0	0	0	0	0	0	0.3	23
21	999	0	0	0	0	0	0	0	5	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0.4	23
22	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6	4	2	4	5	2	0	1.2	23
23	999	0	0	0	0	0	0	0	2	8	3	2	2	0	0	0	0	0	0	0	4	6	3	0	1.3	23
24	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
25	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
26	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
27	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.0	23
28	999	0	0	0	3	2	2	3	1	1	1	999	999	1	1	0	0	0	0	0	0	0	1	1	0.8	21
29	999	3	4	3	2	2	3	4	6	3	3	1	0	0	2	1	0	0	0	0	0	0	0	0	1.6	23
30	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.0	23
AVG	999	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	1	0	0		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	3	4	3	3	2	3	4	6	15	30	17	5	13	14	10	11	8	4	2	4	10	3	4		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	0
MINIMUM:	0
MAXIMUM:	30
OBSERVATIONS:	676
% DATA RECOVERY:	93.9

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: SULFUR DIOXIDE
METHOD: INSTRUMENTAL UV STIMU. FLOURESCENCE
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 10/ 1 /92
TO: 10/ 14 /92

HOUR

DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
2	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
3	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
4	999	0	0	0	0	0	0	0	0	0	1	4	5	6	9	7	2	1	0	0	0	0	1	5	1.8	23
5	999	3	1	0	1	0	0	0	7	2	2	2	3	3	999	3	4	2	3	1	2	1	0	0	1.8	22
6	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
7	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
8	999	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	1	1	0	0	0.3	23
9	999	0	0	0	0	0	0	0	0	12	17	12	7	3	1	0	0	0	7	8	0	0	0	0	2.9	23
10	999	0	0	1	2	2	2	0	0	1	1	6	2	1	1	3	2	1	2	0	0	8	4	1	1.7	23
11	999	0	0	0	0	0	0	0	0	0	0	2	15	4	3	1	5	23	11	5	4	2	1	2	3.4	23
12	999	0	1	0	0	0	0	999	999	999	2	2	2	2	999	3	4	3	6	6	3	3	3	1	2.2	19
13	999	0	0	0	1	1	1	0	1	999	999	2	3	2	1	1	1	1	1	1	4	5	1	0	1.3	21
14	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	23
AVG	999	0	0	0	0	0	0	0	1	1	2	2	3	2	1	1	1	2	2	2	1	1	1	1		
MIN	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	999	3	1	1	2	2	2	0	7	12	17	12	15	6	9	7	5	23	11	8	4	8	4	5		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	1
MINIMUM:	0
MAXIMUM:	23
OBSERVATIONS:	315
% DATA RECOVERY:	93.8

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 02/ 15 /92
TO: 02/ 29 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
15	25	22	20	20	13	9	8	3	16	32	37	39	40	44	48	48	42	39	37	33	26	25	27	26	28.3	24
16	21	18	22	14	17	19	25	24	25	28	32	39	41	40	35	38	31	25	24	18	5	5	2	3	23.0	24
17	3	1	2	1	11	8	9	13	18	21	29	35	38	999	999	999	40	42	35	28	36	32	23	22	21.3	21
18	24	23	25	22	19	17	11	4	13	19	22	999	999	38	44	41	39	39	37	29	22	18	17	14	24.4	22
19	15	16	13	16	17	18	18	18	18	22	25	25	28	32	30	18	30	21	28	25	11	7	8	3	19.3	24
20	4	6	1	9	16	25	23	19	27	34	33	39	49	56	60	61	60	58	56	49	47	45	36	37	35.4	24
21	37	35	31	31	30	31	27	24	29	34	43	49	50	55	52	47	47	45	42	39	38	36	36	36	38.5	24
22	37	32	31	29	25	23	18	15	24	27	27	28	28	29	29	28	28	24	23	23	21	18	17	19	25.1	24
23	12	9	7	10	10	8	7	11	15	18	24	28	30	36	38	35	34	31	26	24	20	17	13	5	19.5	24
24	4	7	6	7	3	6	4	3	12	17	25	29	30	34	999	999	18	17	25	26	22	21	25	27	16.7	22
25	28	27	21	20	18	19	11	12	16	22	23	24	22	26	25	28	29	27	21	22	25	27	26	21	22.5	24
26	20	20	21	22	22	20	21	20	22	29	34	41	38	35	41	45	50	43	39	39	38	40	36	32	32.0	24
27	33	35	35	37	37	36	38	38	37	39	42	45	50	47	46	51	36	35	37	30	28	27	27	21	37.0	24
28	20	22	30	34	35	32	30	31	39	43	47	48	51	52	53	51	55	53	49	46	42	38	41	42	41.0	24
29	41	41	40	40	37	33	26	27	36	43	49	54	60	67	68	67	67	63	54	50	43	32	31	28	45.7	24
AVG	22	21	20	21	21	20	18	17	23	29	33	37	40	42	44	43	40	37	36	32	28	26	24	22		
MIN	3	1	1	1	3	6	4	3	12	17	22	24	22	26	25	18	18	17	21	18	5	5	2	3		
MAX	41	41	40	40	37	36	38	38	39	43	49	54	60	67	68	67	67	63	56	50	47	45	41	42		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	29
MINIMUM:	1
MAXIMUM:	68
OBSERVATIONS:	353
% DATA RECOVERY:	98.1

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 03/ 1 /92
TO: 03/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	28	32	30	28	22	14	7	12	29	47	58	66	67	68	68	67	66	65	60	57	30	53	40	36	43.8	24
2	29	35	33	42	43	47	50	25	37	47	57	999	999	999	70	71	72	70	52	25	49	48	44	35	46.7	21
3	32	31	25	16	20	9	4	5	23	49	58	68	67	66	63	63	61	54	52	51	54	49	44	44	42.0	24
4	40	37	34	27	25	18	10	10	16	30	38	41	43	41	38	33	34	35	30	29	28	19	26	28	29.6	24
5	27	26	26	28	25	25	21	23	31	36	39	42	44	47	48	48	47	43	40	36	33	30	26	22	33.9	24
6	21	20	18	16	14	14	9	9	21	28	33	34	36	40	49	53	47	35	28	24	20	18	14	1	25.1	24
7	5	7	5	4	16	13	16	17	15	14	20	22	30	28	23	17	15	19	26	15	6	11	11	7	15.1	24
8	2	14	14	14	15	19	19	20	26	29	36	45	54	58	61	63	64	63	44	20	33	32	25	16	32.8	24
9	21	19	13	17	13	8	7	6	27	38	43	49	49	50	47	50	53	51	51	49	48	54	44	43	35.4	24
10	41	35	29	29	28	27	23	23	29	29	30	33	35	33	31	30	31	31	31	29	30	34	38	39	31.2	24
11	34	25	28	28	29	29	25	27	34	30	28	32	39	42	44	52	50	44	38	34	37	34	30	26	34.1	24
12	23	21	26	25	24	19	16	22	23	24	29	30	31	30	25	24	32	31	29	26	25	28	35	34	26.3	24
13	32	30	28	31	31	32	31	27	36	42	48	49	999	999	58	63	60	54	48	41	37	39	43	44	41.1	22
14	45	42	43	46	43	40	34	32	35	39	42	45	50	55	59	64	62	61	53	40	37	39	40	36	45.1	24
15	36	42	35	32	31	28	26	33	44	49	59	63	66	70	72	74	75	72	66	57	47	45	37	37	49.8	24
16	36	37	35	39	38	34	38	41	41	42	44	45	50	50	55	59	62	65	51	44	45	42	37	37	44.5	24
17	39	36	30	26	30	33	17	17	39	50	58	61	62	63	65	67	67	62	53	48	41	40	38	29	44.6	24
18	29	22	27	25	28	20	10	14	32	39	43	43	46	46	44	44	50	49	42	33	30	26	18	16	32.3	24
19	17	20	21	20	19	17	18	21	26	30	34	36	37	36	31	36	37	33	32	24	23	20	17	20	26.0	24
20	27	27	28	28	27	30	34	38	48	52	53	999	999	52	52	54	52	42	42	40	41	39	38	34	39.9	22
21	35	38	38	36	33	29	31	28	31	39	48	53	56	60	64	67	69	65	64	55	46	43	29	35	45.5	24
22	37	33	31	21	23	29	25	17	29	37	42	46	47	46	44	40	37	40	36	31	29	31	37	35	34.3	24
23	33	32	35	37	36	33	30	27	30	33	38	44	39	999	39	43	43	44	43	37	32	36	34	30	36.0	23
24	27	18	24	33	30	28	23	25	33	37	42	51	57	56	55	54	51	50	48	45	43	41	40	38	39.5	24
25	40	39	38	33	28	23	22	25	35	44	45	47	46	46	47	47	46	43	38	35	31	30	27	23	36.6	24
26	20	24	23	23	21	16	3	7	23	37	48	54	58	59	60	60	60	58	54	47	42	42	37	30	37.8	24
27	30	23	22	20	26	21	18	12	29	46	59	65	68	999	999	76	88	83	64	48	37	38	39	41	43.3	22
28	40	37	38	36	37	33	33	31	31	41	46	53	60	67	74	78	77	67	58	53	35	25	36	36	46.8	24
29	38	38	34	38	36	33	28	38	46	54	70	72	72	71	71	65	59	71	62	56	43	44	34	38	50.5	24
30	33	36	31	26	30	37	22	19	38	47	50	50	54	56	56	56	52	44	33	33	38	37	34	34	39.4	24
31	35	35	32	31	29	25	24	32	44	49	58	62	61	58	61	64	58	48	37	27	23	26	21	21	40.0	24
AVG	30	29	28	28	27	25	22	22	32	39	45	48	51	52	52	54	54	51	45	38	35	35	33	30		
MIN	2	7	5	4	13	8	3	5	15	14	20	22	30	28	23	17	15	19	26	15	6	11	11	1		
MAX	45	42	43	46	43	47	50	41	48	54	70	72	72	71	74	78	88	83	66	57	54	54	44	44		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	38
MINIMUM:	1
MAXIMUM:	88
OBSERVATIONS:	734
% DATA RECOVERY:	98.7

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 04/ 1 /92
TO: 04/ 30 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	23	21	22	22	26	25	4	12	38	45	48	47	43	56	82	83	70	63	61	50	45	41	40	36	41.8	24
2	36	34	31	34	37	35	32	36	48	54	59	64	69	999	999	999	69	65	61	52	47	42	43	46	47.3	21
3	44	41	37	34	35	31	24	32	37	39	41	43	42	42	41	47	53	49	43	32	33	28	23	24	37.3	24
4	33	36	33	40	44	45	38	41	50	55	59	60	64	65	69	60	63	54	48	34	46	51	50	48	49.4	24
5	45	42	38	32	35	37	38	42	57	65	66	68	70	72	75	77	77	64	60	57	56	54	53	51	55.5	24
6	47	43	41	40	35	29	30	37	48	54	56	59	999	999	999	62	59	57	50	46	43	35	37	43	45.3	21
7	46	46	45	38	25	11	9	23	36	42	999	999	999	37	38	35	38	41	44	41	35	30	28	28	34.1	21
8	30	31	27	27	27	26	23	23	26	34	40	47	53	58	66	69	69	64	50	49	42	34	32	24	40.5	24
9	35	35	34	35	33	28	29	30	32	39	46	49	51	52	52	57	51	49	45	42	37	32	31	28	39.7	24
10	24	20	19	14	10	10	4	12	24	33	39	41	42	46	47	49	45	41	42	38	30	23	21	16	28.8	24
11	15	10	11	11	11	8	15	20	26	31	34	35	37	38	38	38	38	38	30	24	25	25	22	22	25.1	24
12	17	27	33	39	40	35	30	34	37	35	37	39	35	34	35	40	35	31	27	19	10	19	9	11	29.5	24
13	14	12	7	3	2	2	7	16	25	31	38	999	999	55	53	47	44	43	40	39	40	41	43	43	29.3	22
14	42	41	39	38	37	35	33	34	38	41	45	49	51	51	51	50	48	44	42	38	36	34	29	30	40.7	24
15	27	24	18	19	19	14	12	19	32	42	47	50	51	50	51	49	48	48	45	43	40	37	32	34	35.5	24
16	30	28	25	22	21	20	21	28	47	52	53	55	57	57	57	53	54	50	47	45	42	40	39	34	40.7	24
17	31	28	28	27	20	21	10	26	42	48	50	52	54	56	57	59	54	52	48	43	39	33	32	29	39.1	24
18	30	29	23	23	20	13	9	24	38	44	46	48	49	51	52	52	52	50	42	42	39	36	35	33	36.7	24
19	31	28	27	26	25	23	22	26	30	33	36	38	39	39	38	35	33	33	31	28	31	33	27	20	30.5	24
20	21	21	25	26	23	15	11	21	24	25	28	999	999	37	41	44	41	36	30	32	23	17	20	10	26.0	22
21	9	10	9	9	8	6	7	10	13	15	22	28	24	20	22	25	24	24	24	25	26	24	20	18	17.6	24
22	13	9	1	1	3	2	3	10	19	24	27	30	31	33	35	37	38	35	33	32	26	26	23	18	21.2	24
23	16	15	17	11	6	2	5	13	21	30	37	39	38	39	38	37	39	35	34	34	30	31	22	20	25.4	24
24	15	17	13	6	7	2	1	10	29	36	42	50	54	44	47	44	48	48	40	34	19	26	33	30	29.0	24
25	27	29	24	16	15	11	10	14	16	19	25	30	35	33	30	34	41	23	17	28	22	21	18	18	23.2	24
26	23	23	32	34	35	32	34	36	37	40	44	48	50	50	51	49	48	47	43	41	38	38	35	31	39.1	24
27	30	30	28	29	32	30	27	29	35	38	38	41	999	999	54	53	53	52	50	48	44	41	39	37	39.0	22
28	32	30	29	34	37	39	37	36	42	46	47	49	53	54	54	56	60	60	56	51	46	43	43	37	44.6	24
29	38	39	26	24	24	25	27	31	999	999	999	999	999	999	999	74	75	73	61	37	44	47	44	45	43.2	17
30	34	43	24	21	4	14	19	27	48	58	67	71	75	81	84	86	90	90	73	70	60	35	43	48	52.7	24
AVG	29	28	26	25	23	21	19	25	34	40	43	47	49	48	50	52	52	49	44	40	36	34	32	30		
MIN	9	9	1	1	2	2	1	10	13	15	22	28	24	20	22	25	24	23	17	19	10	17	9	10		
MAX	47	46	45	40	44	45	38	42	57	65	67	71	75	81	84	86	90	90	73	70	60	54	53	51		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	36
MINIMUM:	1
MAXIMUM:	90
OBSERVATIONS:	698
% DATA RECOVERY:	96.9

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 05/ 1 /92
TO: 05/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	46	47	46	41	31	36	38	42	58	67	71	76	81	83	84	83	81	76	59	44	56	51	51	52	58.3	24
2	52	47	25	25	24	27	12	39	54	67	72	76	80	83	93	95	85	78	58	43	47	50	33	46	54.6	24
3	43	37	39	41	36	26	19	35	49	60	64	73	75	80	82	80	79	70	61	41	21	24	25	24	49.3	24
4	24	23	24	22	19	20	20	25	34	46	59	68	71	65	71	63	60	56	52	48	45	999	999	999	43.6	21
5	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
6	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
7	999	999	999	999	999	999	999	999	999	999	999	999	999	999	57	57	56	54	54	51	49	46	38	38	50.0	10
8	37	33	29	27	25	17	14	30	39	54	62	65	68	64	65	61	63	59	60	61	60	53	46	40	47.2	24
9	33	33	36	36	17	8	6	28	60	65	68	69	68	68	69	74	78	79	76	50	52	48	43	39	50.1	24
10	40	42	38	41	41	34	32	37	57	68	71	71	71	72	72	71	71	72	66	55	52	52	55	49	55.4	24
11	43	48	33	27	32	25	8	33	58	65	76	94	76	75	77	72	71	74	69	62	58	53	50	49	55.3	24
12	46	44	41	26	8	1	3	33	58	67	76	82	87	89	90	91	90	90	81	64	66	58	57	50	58.3	24
13	43	42	33	43	40	29	12	44	53	59	70	78	62	66	55	50	53	49	40	40	43	48	48	51	48.0	24
14	49	45	41	35	44	43	34	34	40	50	66	999	999	82	86	91	88	65	55	46	53	45	38	37	53.0	22
15	38	42	38	19	11	9	6	26	52	64	62	61	59	57	53	54	66	59	55	42	38	37	43	37	42.8	24
16	28	27	24	17	20	20	18	21	23	28	34	37	39	39	33	32	30	32	26	23	20	18	19	17	26.0	24
17	15	14	12	11	13	14	15	21	25	28	29	30	31	29	26	27	28	26	26	24	20	17	18	16	21.5	24
18	14	13	9	10	9	6	7	16	24	28	31	34	35	999	999	34	34	32	31	28	22	18	14	11	20.9	22
19	11	12	11	10	8	2	5	15	27	33	36	37	37	37	38	38	39	38	37	30	27	25	21	18	24.7	24
20	15	13	13	12	11	7	12	24	37	46	53	56	58	59	58	57	57	54	52	48	43	38	43	38	37.7	24
21	37	37	37	36	35	29	29	32	37	999	999	55	56	57	57	48	48	46	45	40	35	27	24	24	39.6	22
22	23	30	30	29	33	32	24	33	43	48	51	53	54	55	53	50	48	42	38	35	32	27	25	19	37.8	24
23	17	15	13	17	20	23	26	30	34	40	44	46	48	47	53	60	68	67	56	43	40	36	34	31	37.8	24
24	27	29	29	30	22	11	5	20	33	42	67	70	70	70	73	77	75	74	60	48	32	31	28	33	44.0	24
25	25	26	28	8	10	11	16	33	54	62	69	71	73	71	72	72	70	62	62	64	61	52	48	44	48.5	24
26	38	41	18	9	11	22	21	30	46	60	60	65	63	68	68	65	62	64	58	50	43	40	35	31	44.5	24
27	30	28	26	27	26	20	9	13	25	45	58	65	70	63	78	79	83	63	61	49	47	36	35	38	44.8	24
28	27	18	11	19	8	10	16	25	37	49	54	59	999	999	52	55	52	48	37	36	35	26	21	19	32.5	22
29	22	12	10	9	13	6	4	15	28	36	44	46	47	48	52	56	54	36	20	24	21	19	32	33	28.6	24
30	24	18	15	13	11	12	16	21	27	35	43	47	50	53	51	50	51	52	51	57	53	42	31	31	35.6	24
31	31	24	21	9	9	9	18	25	31	42	50	54	53	58	61	67	71	66	62	51	24	19	18	15	37.0	24
AVG	31	30	26	23	21	18	16	28	41	50	57	61	61	63	64	62	62	58	52	45	41	37	35	33		
MIN	11	12	9	8	8	1	3	13	23	28	29	30	31	29	26	27	28	26	20	23	20	17	14	11		
MAX	52	48	46	43	44	43	38	44	60	68	76	94	87	89	93	95	90	90	81	64	66	58	57	52		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	42
MINIMUM:	1
MAXIMUM:	95
OBSERVATIONS:	671
% DATA RECOVERY:	90.2

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 06/ 1 /92
TO: 06/ 30 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	13	9	7	5	3	3	5	21	35	44	49	999	999	999	48	51	70	49	43	65	61	45	33	29	32.8	21
2	27	25	16	23	17	13	9	20	27	50	66	72	74	78	79	56	53	48	44	38	28	33	38	35	40.4	24
3	29	22	25	23	20	16	15	13	12	13	17	22	22	21	24	25	20	23	20	19	20	18	19	19	19.9	24
4	18	16	14	12	11	10	10	10	13	14	17	22	22	21	18	22	21	19	16	14	12	9	7	8	14.8	24
5	8	7	8	9	9	9	8	10	12	15	18	32	28	26	23	22	22	22	19	12	11	9	6	6	14.6	24
6	8	10	10	11	10	8	4	7	12	17	18	16	17	22	22	19	19	21	20	16	14	12	11	10	13.9	24
7	7	8	7	10	8	5	7	15	19	24	25	25	26	27	24	25	26	24	25	21	21	21	17	16	18.0	24
8	12	13	9	7	8	1	8	10	15	19	22	999	999	28	28	29	29	30	29	27	20	16	18	7	17.5	22
9	8	8	12	5	3	1	4	13	16	21	25	26	28	29	30	32	34	36	36	29	28	25	22	21	20.5	24
10	18	15	13	13	13	13	14	17	24	25	23	21	31	49	67	62	58	48	27	17	13	8	4	4	24.9	24
11	4	2	4	1	1	1	4	9	14	17	28	41	55	57	63	61	56	52	40	24	15	9	13	6	24.0	24
12	5	3	1	2	2	1	3	6	11	14	999	999	999	999	51	42	41	37	20	10	31	34	31	27	18.6	20
13	22	18	17	18	17	16	17	19	17	16	17	18	20	32	24	20	18	36	31	22	21	18	15	13	20.1	24
14	14	13	16	14	12	8	9	11	15	22	24	30	33	30	30	36	39	35	21	17	9	6	2	3	18.7	24
15	6	8	10	6	5	8	11	13	18	19	28	33	36	34	34	999	999	35	29	29	36	32	28	23	21.9	22
16	30	25	25	20	15	15	10	20	25	30	40	999	999	55	55	55	60	50	999	999	999	999	999	999	33.1	16
17	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
18	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
19	999	999	999	999	999	999	999	999	999	999	999	999	999	44	44	46	47	49	46	42	37	40	41	35	42.8	11
20	37	34	30	19	23	19	20	27	39	46	60	66	74	75	83	69	65	59	48	50	51	49	44	32	46.6	24
21	28	28	27	24	29	30	33	37	49	57	63	67	75	71	60	60	64	68	63	57	54	50	43	40	49.0	24
22	40	30	26	25	23	27	23	33	49	53	54	55	65	63	59	62	76	70	58	41	33	31	33	32	44.2	24
23	26	22	20	17	13	10	8	18	22	24	25	29	28	31	26	25	28	27	23	17	18	18	22	21	21.6	24
24	17	17	18	17	16	18	12	11	16	20	19	18	18	20	20	23	25	26	25	23	21	19	11	11	18.4	24
25	10	11	11	10	10	8	9	12	16	17	999	999	12	21	20	26	26	27	27	26	25	26	26	25	18.2	22
26	23	21	20	23	24	23	21	18	21	21	22	22	23	24	22	22	24	24	20	19	16	13	11	12	20.4	24
27	11	13	14	13	10	9	10	11	14	18	19	19	19	19	22	22	19	8	13	11	13	15	18	17	14.9	24
28	14	14	13	13	14	13	11	13	20	22	20	19	22	23	21	22	22	21	22	20	17	15	13	11	17.3	24
29	10	13	13	13	14	13	999	999	15	17	999	22	22	22	24	24	21	29	29	20	11	11	14	14	17.7	21
30	14	12	12	12	12	12	10	11	15	22	22	20	22	22	24	24	22	20	18	17	14	13	11	11	16.3	24
AVG	17	15	15	14	13	11	11	16	21	25	30	32	34	36	37	36	37	35	30	26	24	22	20	18		
MIN	4	2	1	1	1	1	3	6	11	13	17	16	12	19	18	19	18	8	13	10	9	6	2	3		
MAX	40	34	30	25	29	30	33	37	49	57	66	72	75	78	83	69	76	70	63	65	61	50	44	40		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	24
MINIMUM:	1
MAXIMUM:	83
OBSERVATIONS:	635
% DATA RECOVERY:	88.2

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 07/ 1 /92
TO: 07/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	10	10	11	7	8	7	8	14	21	22	23	24	25	27	28	30	29	31	35	22	10	10	4	3	17.5	24
2	3	3	3	3	3	3	4	10	20	37	54	56	999	999	55	57	58	52	46	70	54	34	25	18	30.4	22
3	15	12	10	11	10	11	12	19	24	25	35	51	65	65	46	34	31	30	27	23	19	12	6	6	25.0	24
4	7	8	8	10	12	12	11	18	29	35	42	45	48	47	49	54	61	56	54	44	38	33	31	32	32.7	24
5	29	16	24	27	26	23	20	25	43	54	57	60	64	67	67	68	69	69	65	58	48	52	49	50	47.1	24
6	48	45	32	30	31	22	26	33	46	67	76	999	80	87	95	86	90	90	76	58	50	39	39	57	56.7	23
7	56	51	45	38	28	24	21	29	39	46	52	53	72	72	70	62	50	48	45	34	28	29	23	26	43.4	24
8	20	10	11	12	14	7	18	29	40	54	59	62	63	64	67	67	67	70	69	63	45	38	36	32	42.4	24
9	33	18	20	15	25	22	22	25	24	27	38	52	59	62	64	63	62	67	58	42	39	28	30	26	38.4	24
10	25	34	30	22	18	8	6	16	25	43	999	999	69	66	61	53	55	999	46	39	36	35	33	14	35.0	21
11	12	17	18	18	23	11	8	21	34	33	40	61	68	73	71	70	72	64	46	33	25	20	18	22	36.6	24
12	9	10	15	13	12	8	9	12	13	23	29	30	32	34	34	35	39	38	35	27	19	23	22	21	22.6	24
13	17	13	7	6	11	7	7	17	23	25	27	28	30	33	32	31	31	30	27	21	14	12	11	9	19.5	24
14	6	6	7	9	7	9	8	20	29	35	39	38	40	44	48	49	46	36	41	43	37	30	29	25	28.4	24
15	22	17	13	11	13	7	8	18	24	30	33	32	33	33	34	38	35	999	32	25	20	21	17	16	23.1	23
16	16	13	8	6	9	8	14	18	23	29	31	999	35	33	37	40	40	40	38	43	38	37	28	23	26.4	23
17	17	14	13	14	10	6	6	12	19	24	28	31	-33	34	34	37	35	32	35	33	26	23	19	15	22.9	24
18	14	13	8	10	9	7	7	14	21	26	27	31	31	32	33	33	36	37	36	30	23	999	999	15	22.4	22
19	13	10	10	10	11	10	14	24	25	27	28	29	29	28	32	31	25	23	23	22	10	9	11	14	19.5	24
20	8	10	8	6	6	4	6	13	18	24	28	32	33	32	999	999	30	28	24	18	13	15	13	12	17.3	22
21	12	11	11	10	6	5	7	14	20	999	999	31	32	34	31	31	28	30	26	27	26	12	12	15	19.6	22
22	8	11	13	11	7	6	9	18	25	29	32	33	35	37	36	35	32	34	30	25	20	19	18	16	22.5	24
23	15	14	12	10	6	7	9	14	21	27	999	999	999	999	999	28	25	27	27	24	24	18	16	7	17.4	19
24	7	8	10	12	11	8	9	17	22	28	33	33	33	32	32	33	33	30	29	27	11	5	3	5	19.6	24
25	11	12	14	14	13	11	10	17	17	20	25	27	27	28	28	30	30	31	23	13	24	29	24	18	20.7	24
26	16	17	9	3	7	7	10	19	28	37	44	45	49	54	56	59	57	55	51	42	33	24	13	14	31.2	24
27	9	9	4	4	6	5	9	15	19	22	32	37	34	36	54	61	59	45	31	18	17	11	8	7	23.0	24
28	7	5	3	4	3	3	3	6	15	20	27	30	32	37	51	60	37	28	24	13	18	16	12	8	19.3	24
29	6	7	4	2	2	2	4	9	13	24	33	44	56	67	64	65	60	45	40	40	23	21	17	14	27.6	24
30	10	7	9	3	8	2	3	8	17	25	30	35	44	34	42	33	24	24	21	17	5	3	5	8	17.4	24
31	11	7	10	6	6	5	3	13	19	22	15	999	33	32	40	46	40	36	29	27	21	13	17	17	20.3	23
AVG	16	14	13	12	12	9	10	17	24	31	36	40	44	46	48	47	45	42	38	33	26	22	20	18		
MIN	3	3	3	2	2	2	3	6	13	20	15	24	25	27	28	28	24	23	21	13	5	3	3	3		
MAX	56	51	45	38	31	24	26	33	46	67	76	62	80	87	95	86	90	90	76	70	54	52	49	57		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	27
MINIMUM:	2
MAXIMUM:	95
OBSERVATIONS:	724
% DATA RECOVERY:	97.3

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 08/ 1 /92
TO: 08/ 31 /92

	HOUR																									
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	18	11	8	6	6	5	3	10	17	17	27	34	40	45	53	53	45	36	31	38	29	25	23	17	24.9	24
2	21	19	12	14	17	12	13	19	33	37	42	46	47	48	49	51	48	48	42	40	39	27	27	22	32.2	24
3	29	24	21	18	17	10	7	22	32	40	40	40	45	38	35	51	57	54	58	48	34	31	26	23	33.3	24
4	21	23	18	14	13	10	10	14	19	30	42	45	46	47	40	32	32	36	33	24	21	19	17	16	25.9	24
5	17	13	12	5	4	6	3	13	24	32	35	38	38	33	38	33	29	23	23	17	11	15	15	9	20.3	24
6	8	9	9	8	8	2	7	18	24	29	30	999	999	29	33	33	28	30	27	18	16	15	11	13	18.4	22
7	11	11	11	15	16	9	7	17	20	23	28	29	26	24	23	19	20	22	18	14	14	16	10	4	17.0	24
8	8	12	13	15	14	6	8	14	20	28	29	28	30	29	33	29	27	23	27	25	17	17	15	11	19.9	24
9	8	6	6	6	8	6	5	9	15	19	23	28	32	32	29	39	38	33	28	29	30	19	14	18	20.0	24
10	17	11	6	10	6	4	6	17	32	39	43	47	49	49	53	61	60	66	56	38	38	33	15	17	32.2	24
11	13	13	11	12	8	5	9	18	29	33	38	39	37	35	30	28	25	19	15	11	8	9	8	9	19.3	24
12	9	10	11	8	8	5	10	14	19	23	26	29	29	32	27	30	27	26	24	23	21	20	18	17	19.4	24
13	14	15	17	16	11	7	6	12	17	21	24	24	23	999	999	28	31	36	31	29	26	19	14	9	19.5	22
14	13	16	16	16	12	6	10	14	17	19	22	22	29	31	29	22	20	23	23	19	15	11	13	16	18.1	24
15	15	11	12	6	12	15	16	18	21	24	24	24	22	26	28	30	30	25	23	16	14	17	19	16	19.3	24
16	15	10	9	8	10	13	16	19	24	26	29	31	34	30	36	32	33	30	29	20	18	14	12	11	21.2	24
17	12	11	8	8	8	4	9	13	22	30	32	32	29	31	33	35	31	38	31	27	22	22	23	23	22.3	24
18	21	18	11	17	6	4	3	16	24	36	47	46	52	52	50	51	54	52	66	72	53	40	36	34	35.9	24
19	27	25	24	25	22	18	14	16	26	37	47	56	54	49	50	47	45	40	39	39	25	22	20	24	33.0	24
20	14	11	13	13	10	12	5	21	32	32	35	999	999	999	45	40	34	28	30	33	28	25	27	22	24.3	21
21	17	15	9	7	5	3	3	15	28	36	42	37	40	40	32	25	29	29	24	17	13	7	7	4	20.2	24
22	7	13	16	18	17	14	13	14	17	19	20	20	20	20	21	25	26	23	20	13	7	10	9	7	16.2	24
23	5	4	5	5	3	3	3	7	14	18	20	22	25	22	21	23	19	17	13	7	7	9	12	13	12.4	24
24	12	11	12	13	13	15	14	15	15	15	18	20	20	20	21	19	18	19	16	15	13	14	12	11	15.5	24
25	13	13	13	12	10	8	6	11	15	19	21	21	22	24	24	29	999	999	999	999	999	999	999	999	16.3	16
26	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
27	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999.9	0
28	999	999	999	999	999	999	999	999	999	999	999	999	999	999	18	21	21	16	7	8	9	6	4	6	11.6	10
29	5	3	4	2	4	6	6	8	13	16	17	21	36	34	34	27	19	15	6	5	14	17	8	7	13.6	24
30	12	13	12	13	12	10	5	14	19	24	31	31	33	34	35	38	39	35	33	24	20	15	16	12	22.1	24
31	11	9	10	7	1	1	1	15	29	33	34	36	38	39	39	42	40	32	34	27	19	18	16	13	22.7	24
AVG	14	13	12	11	10	8	8	15	22	27	31	33	34	34	34	34	33	31	29	25	21	18	16	14		
MIN	5	3	4	2	1	1	1	7	13	15	17	20	20	20	18	19	18	15	6	5	7	6	4	4		
MAX	29	25	24	25	22	18	16	22	33	40	47	56	54	52	53	61	60	66	66	72	53	40	36	34		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	22
MINIMUM:	1
MAXIMUM:	72
OBSERVATIONS:	667
% DATA RECOVERY:	89.7

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 09/ 1 /92
TO: 09/ 30 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	10	11	5	5	5	2	2	8	15	17	21	23	27	28	28	26	28	25	17	20	18	14	10	7	15.5	24
2	7	3	3	3	1	2	3	7	12	17	21	25	24	24	27	30	27	31	20	14	16	16	14	9	14.8	24
3	8	6	6	6	7	3	4	11	19	24	27	999	999	34	25	22	20	17	12	9	15	10	6	4	13.4	22
4	6	7	7	7	7	6	9	12	16	19	20	20	20	22	26	24	20	20	26	27	23	17	12	8	15.9	24
5	7	8	8	7	6	7	7	9	12	17	21	22	22	25	29	30	26	26	19	15	15	12	11	10	15.5	24
6	8	8	8	8	7	4	4	9	15	18	19	20	20	22	23	22	19	17	11	10	7	8	8	8	12.6	24
7	8	8	7	7	6	4	3	9	16	21	22	23	24	27	22	25	24	24	20	14	11	11	11	10	14.9	24
8	8	7	6	5	5	4	3	4	12	999	999	30	37	37	35	37	31	24	17	10	7	9	8	8	15.6	22
9	6	6	4	3	2	2	2	6	14	21	29	32	36	41	44	44	33	28	22	20	17	18	15	16	19.2	24
10	13	12	8	8	5	2	4	9	19	26	999	999	999	29	28	27	29	29	21	22	23	19	13	14	17.1	21
11	11	8	11	9	7	8	13	12	18	28	30	32	45	46	50	63	62	47	43	25	22	17	18	15	26.7	24
12	12	5	8	6	4	6	8	13	26	39	42	46	47	47	47	47	46	37	30	23	23	16	5	8	24.6	24
13	12	11	10	9	7	8	9	15	22	28	31	31	31	31	32	32	34	30	25	19	21	30	31	32	22.5	24
14	31	29	29	23	23	21	21	22	30	34	38	46	999	999	49	50	46	41	36	33	28	25	21	20	31.6	22
15	16	13	8	6	7	6	11	17	25	30	29	27	28	29	29	29	32	25	19	17	12	11	12	13	18.8	24
16	12	10	10	8	5	2	3	8	14	20	23	24	25	26	28	28	28	27	21	17	16	15	13	13	16.5	24
17	11	13	11	11	9	5	4	11	18	25	31	60	37	39	36	31	31	29	30	22	15	14	18	13	21.8	24
18	9	10	12	7	6	7	7	12	21	28	33	33	33	30	32	38	36	29	30	27	35	37	32	25	23.7	24
19	12	12	8	10	5	8	3	14	27	34	39	39	39	40	42	43	50	48	34	39	35	32	22	17	27.2	24
20	17	17	15	13	16	14	11	15	21	28	36	37	38	40	42	43	43	40	31	35	36	26	19	15	27.0	24
21	13	10	9	7	6	3	3	13	27	35	39	999	38	42	43	41	40	38	31	38	32	29	23	17	25.1	23
22	16	15	16	10	4	3	3	13	24	34	43	46	47	46	47	41	43	44	43	37	32	40	23	24	28.9	24
23	23	15	12	11	11	17	13	8	22	35	44	50	55	60	59	57	49	40	32	27	23	19	14	15	29.6	24
24	19	18	14	9	8	2	3	5	12	19	999	999	999	26	31	31	24	20	9	12	9	8	9	8	14.1	21
25	7	6	6	6	6	5	6	10	14	19	23	25	26	28	30	27	19	14	18	19	19	15	15	15	15.8	24
26	12	11	10	11	10	7	10	14	24	29	32	34	35	38	31	30	30	27	22	20	18	16	16	14	20.9	24
27	13	11	13	13	12	9	5	7	15	19	22	24	25	26	28	29	29	29	27	20	19	16	11	12	18.1	24
28	9	8	10	9	3	5	5	7	12	16	20	25	33	34	35	34	37	29	27	21	18	15	13	15	18.3	24
29	16	17	15	14	15	13	12	13	18	25	33	39	43	44	41	38	36	30	24	24	23	23	22	23	25.0	24
30	23	23	23	23	24	22	18	24	31	41	48	51	54	54	55	55	42	34	33	29	28	30	30	29	34.3	24
AVG	13	11	10	9	8	7	7	11	19	26	30	33	34	35	36	36	34	30	25	22	21	19	16	15		
MIN	6	3	3	3	1	2	2	4	12	16	19	20	20	22	22	22	19	14	9	9	7	8	5	4		
MAX	31	29	29	23	24	22	21	24	31	41	48	60	55	60	59	63	62	48	43	39	36	40	32	32		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	21
MINIMUM:	1
MAXIMUM:	63
OBSERVATIONS:	707
% DATA RECOVERY:	98.2

EBASCO ENVIRONMENTAL
FLORIDA POWER CORPORATION
POLK COUNTY SITE (HOMELAND)

AIR QUALITY/METEOROLOGY DATA SUMMARY

12-13-1992

STATE: FLORIDA:
AGENCY: PRIVATE
PROJECT: BACKGOUND SURVEILLANCE

POLLUTANT: OZONE
METHOD: INSTRUMENTAL UV DASIBI CORP.
UNITS: PARTS PER BILLION (VOL/VOL)

FROM: 10/ 1 /92
TO: 10/ 14 /92

	HOUR																								
DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	OBS
1	27	27	29	32	31	29	27	31	38	41	44	999	999	999	999	39	36	33	34	30	29	27	27	26	31.9	20
2	28	28	24	21	19	17	25	28	28	29	32	34	33	34	33	31	30	29	31	29	27	27	27	28	28.0	24
3	29	29	28	27	27	26	26	26	25	23	22	20	20	23	22	17	16	13	12	12	13	13	14	14	20.7	24
4	14	14	13	12	14	17	25	25	25	26	30	33	35	34	30	29	31	32	30	27	24	24	25	27	24.8	24
5	31	30	27	25	24	22	22	25	31	39	48	56	56	999	58	57	54	52	47	40	37	32	30	30	38.0	23
6	29	23	21	21	16	17	17	17	20	25	32	36	39	41	38	31	25	24	22	22	22	21	21	20	25.0	24
7	20	20	22	24	22	22	21	21	23	29	31	31	36	34	35	37	33	32	31	29	26	21	20	18	26.6	24
8	17	14	11	9	7	5	3	5	17	26	33	36	35	39	37	39	37	38	37	34	27	29	23	18	24.0	24
9	14	12	15	15	6	2	3	8	20	25	30	39	49	56	60	64	60	53	55	37	23	21	17	13	29.0	24
10	11	11	11	13	14	12	8	9	15	22	33	41	48	55	62	63	61	48	33	31	41	27	26	24	30.0	24
11	22	18	15	14	15	11	8	16	20	23	27	37	35	32	28	27	27	17	16	11	14	13	11	9	19.4	24
12	6	9	14	14	13	16	24	28	32	41	999	999	999	61	999	67	66	61	49	45	42	34	30	32	34.2	20
13	28	25	18	21	26	24	18	16	30	39	999	999	68	999	999	80	83	63	45	45	36	33	31	30	38.0	20
14	21	28	30	27	27	21	20	23	34	999	999	999	999	999	999	999	999	999	999	999	999	999	999	999	25.7	9
AVG	21	21	20	20	19	17	18	20	26	30	33	36	41	41	40	45	43	38	34	30	28	25	23	22		
MIN	6	9	11	9	6	2	3	5	15	22	22	20	20	23	22	17	16	13	12	11	13	13	11	9		
MAX	31	30	30	32	31	29	27	31	38	41	48	56	68	61	62	80	83	63	55	45	42	34	31	32		

999 Indicates missing data or calibration activities.

MONTHLY SUMMARY

AVERAGE:	28
MINIMUM:	2
MAXIMUM:	83
OBSERVATIONS:	308
% DATA RECOVERY:	91.7

10.5.6.4 Summary of On-Site PM_{10} Monitoring Data and Wind Directions During PM_{10} Sampling (2/15/92 - 10/14/92)

EBASCO ENVIRONMENTAL — AIR QUALITY SUMMARY — FROM: 02/15/92
FLORIDA POWER CORPORATION — TO: 10/14/92
POLK COUNTY SITE (HOMELAND)

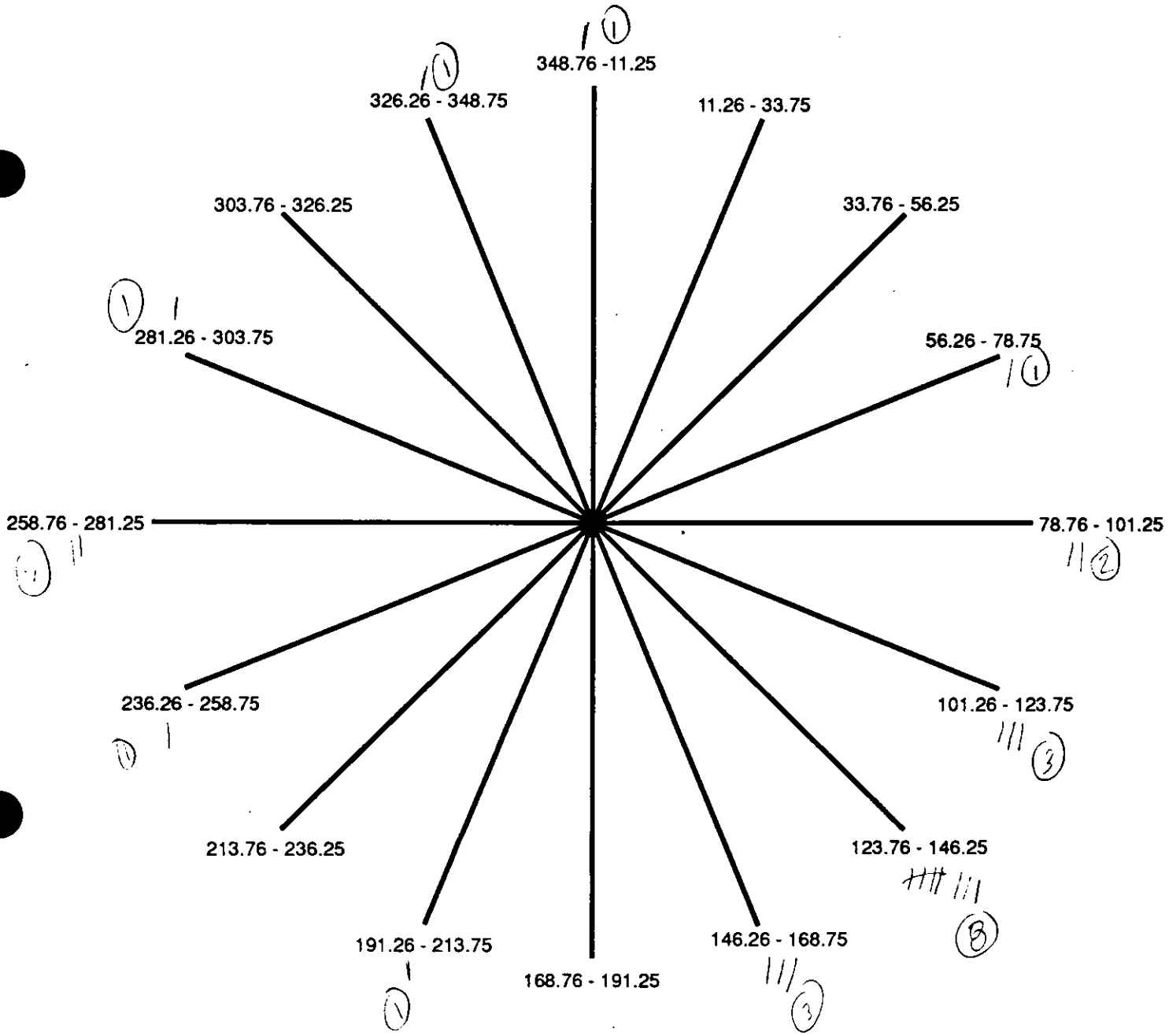
POLLUTANT: PARTICULATE, PM_{10}
METHOD: VACUUM SAMPLER
UNITS: MICROGRAMS PER CUBIC METER

STATE: FLORIDA
AGENCY: PRIVATE
PROJECT: BACKGROUND SURVEILLANCE

Date	Concentration
Feb 24, 1992	10.4
Mar 01, 1992	18.6
Mar 07, 1992	13.1
Mar 13, 1992	15.2
Mar 19, 1992	23.5
Mar 25, 1992	17.8
Mar 31, 1992	20.3
Apr 06, 1992	24.4
Apr 12, 1992	9.9
Apr 18, 1992	14.2
Apr 24, 1992	27.3
Apr 30, 1992	43.9
May 06, 1992	34.9
May 08, 1992	27.4
May 12, 1992	35.0
May 18, 1992	10.2
May 24, 1992	20.4
May 27, 1992	30.8
May 30, 1992	15.4
Jun 05, 1992	33.8
Jun 11, 1992	22.6
Jun 19, 1992	12.5
Jul 05, 1992	30.9
Jul 11, 1992	40.6
Jul 17, 1992	12.4
Jul 23, 1992	16.9
Jul 27, 1992	70.4
Aug 04, 1992	25.0
Aug 10, 1992	17.7
Aug 16, 1992	11.4
Aug 22, 1992	9.9
Aug 28, 1992	13.7
Sep 09, 1992	11.9
Sep 11, 1992	21.2
Sep 15, 1992	15.3
Sep 15, 1992	9.1
Sep 27, 1992	10.0
Oct 03, 1992	15.4
Oct 09, 1992	9.2
Avg	21.1
Min	9.1
Max	70.4

PM10 BACKGROUND VALUES (WINDS 45 – 135 DEGREES)

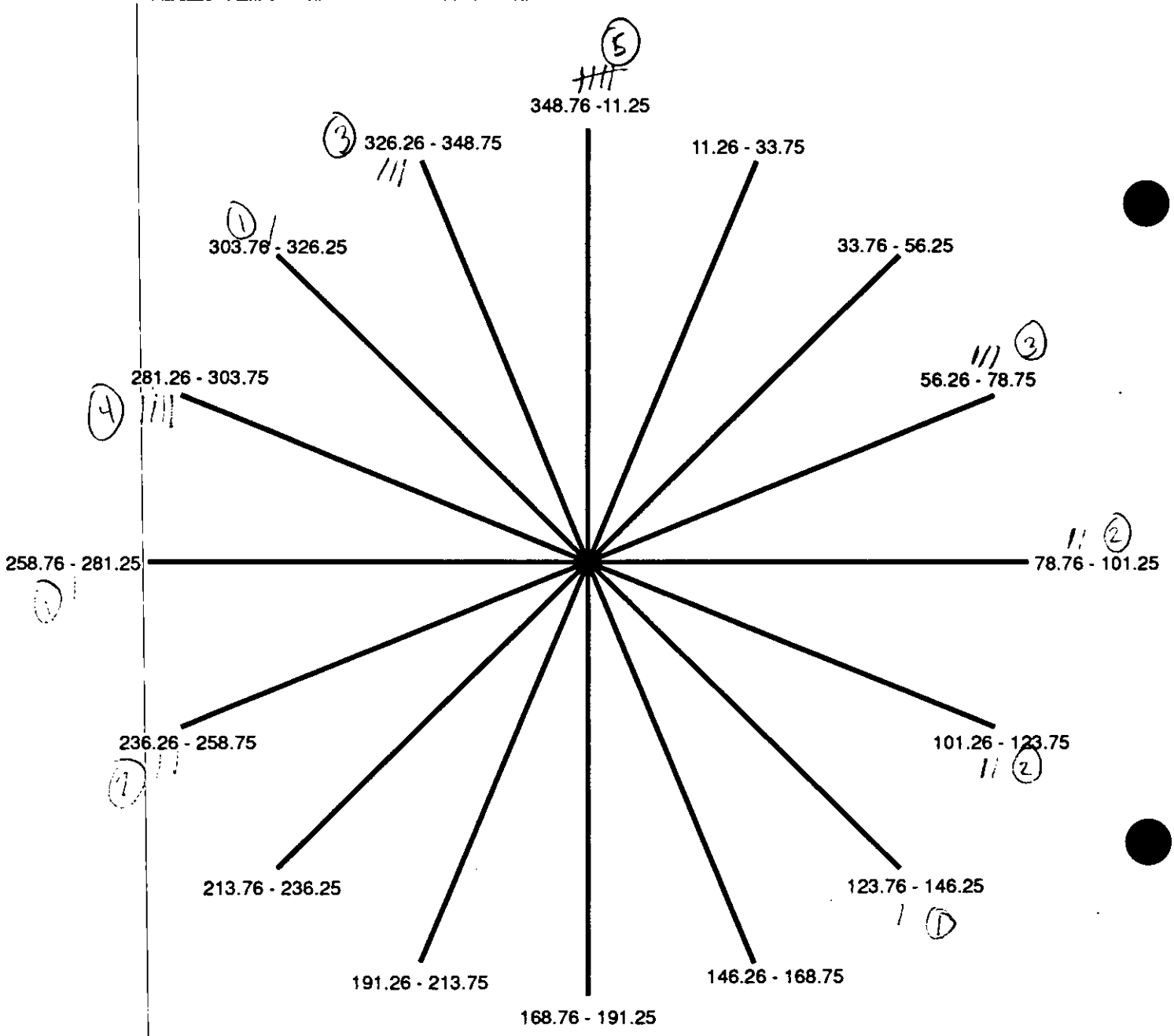
DATE	CONC. (ug/m3)
OCT 27, 91	12.8
NOV 20, 91	10.5
DEC 08, 91	9.8
DEC 20, 91	18.1
APR 06, 92	24.4
APR 18, 92	14.2
MAY 18, 92	10.2
JUL 17, 92	12.4
AUG 22, 92	9.9
SEP 15, 92	15.3
SEP 27, 92	10.0



DATE: 2-24-92

CONCENTRATION: 10.4 ug/M^3

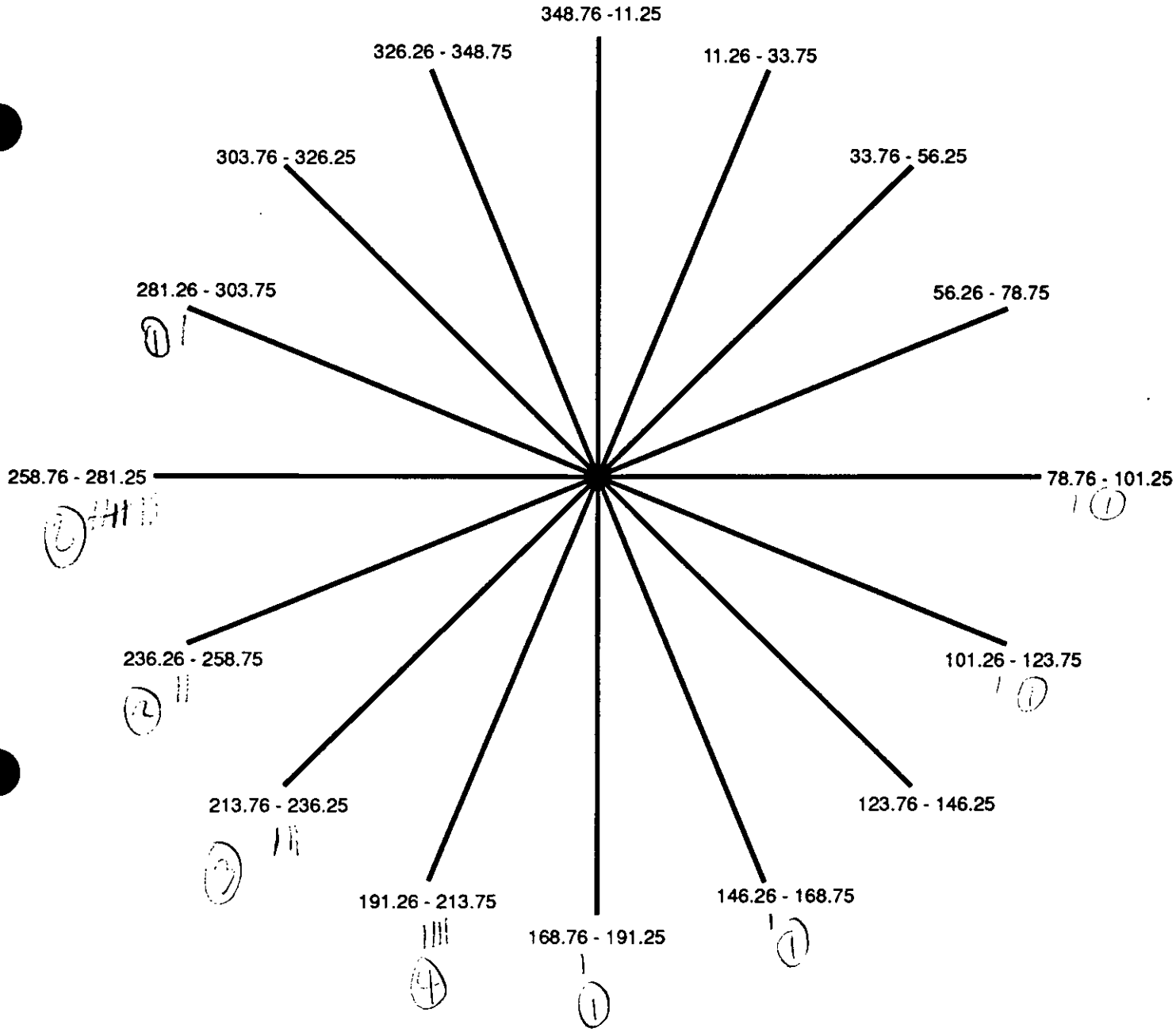
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 3-1-92

CONCENTRATION: 18.6 ug/M^3

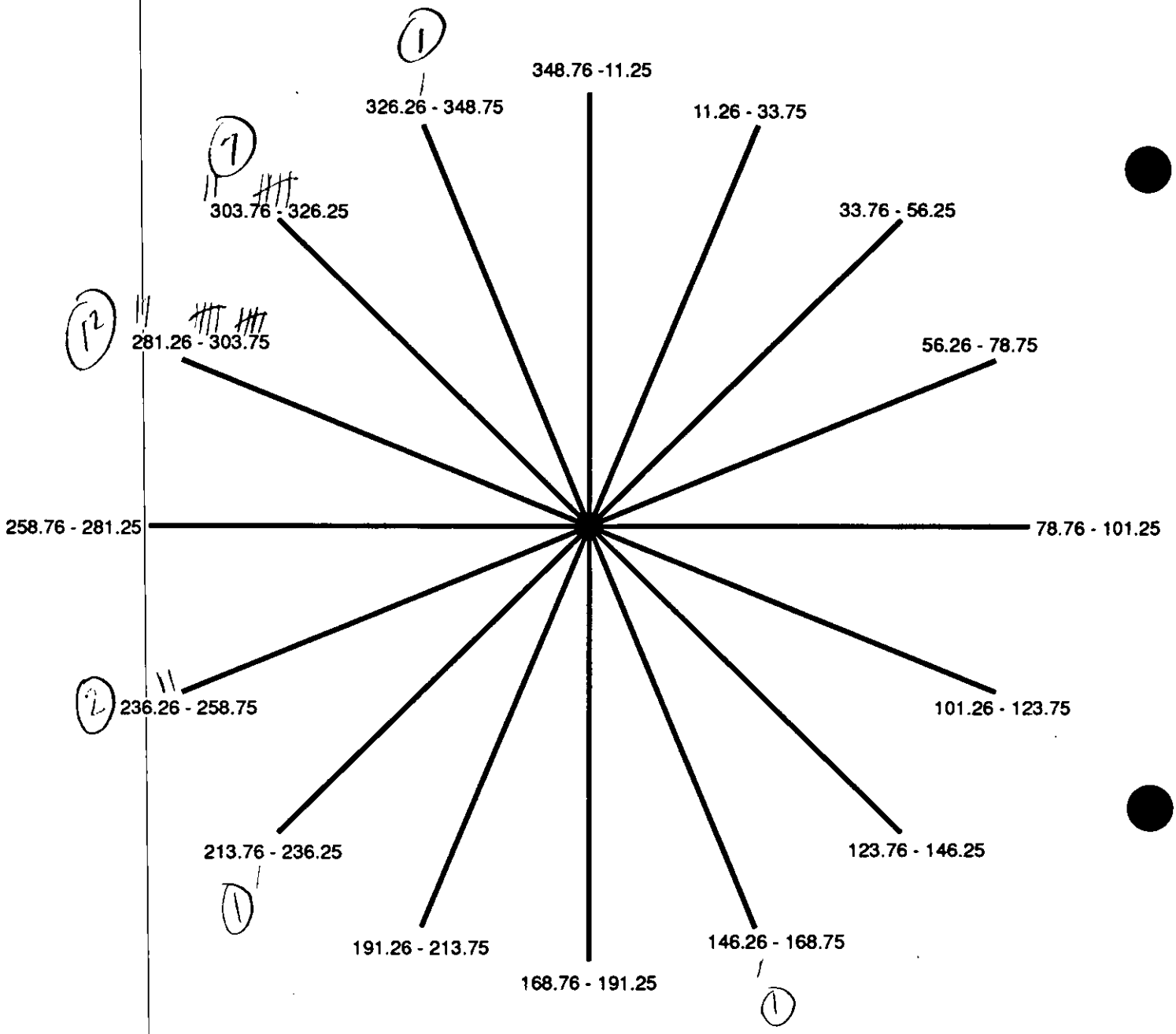
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-7-92

CONCENTRATION: 120 ug/M^3

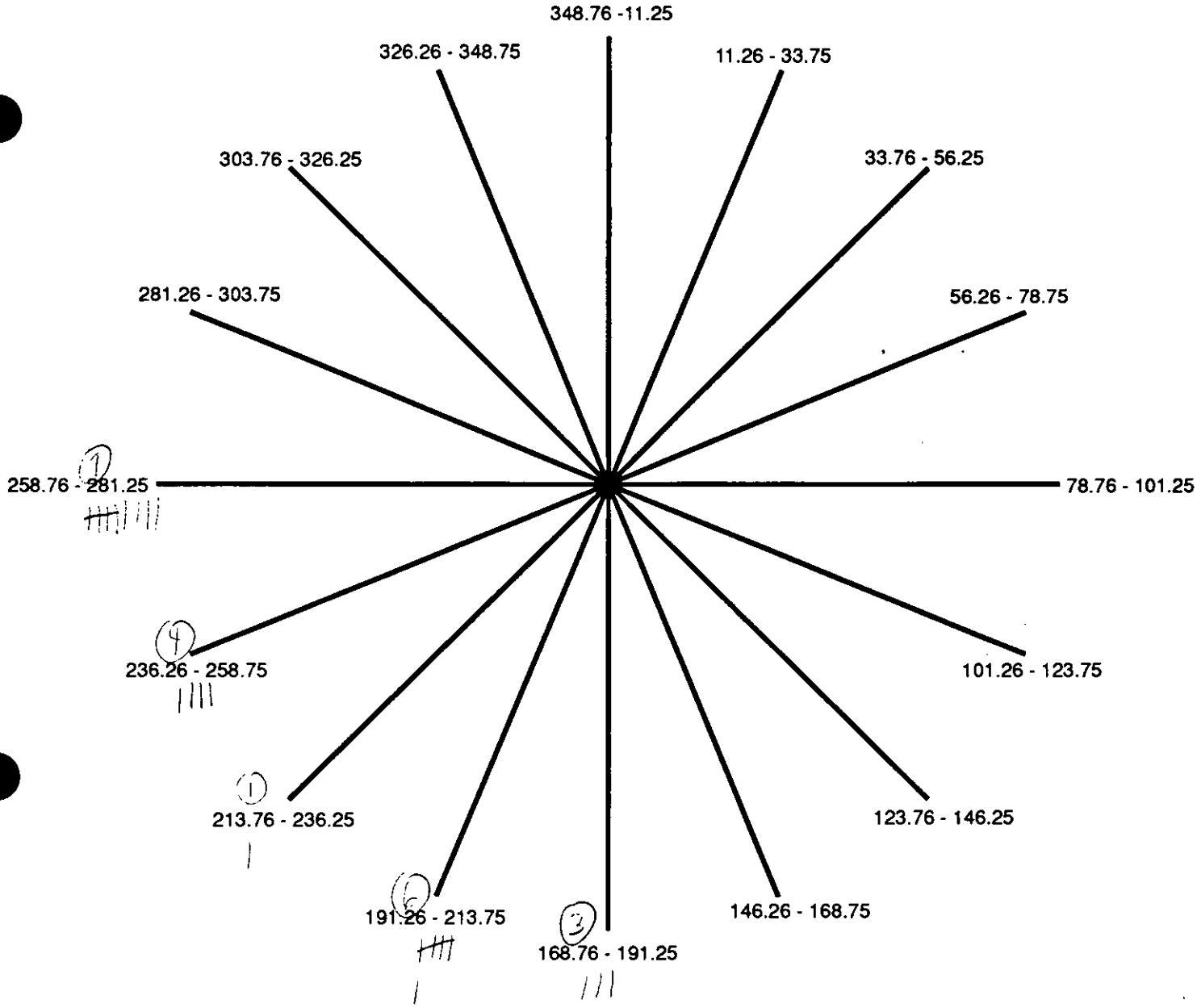
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 2-13-92

CONCENTRATION: 15.2 ug/M^3

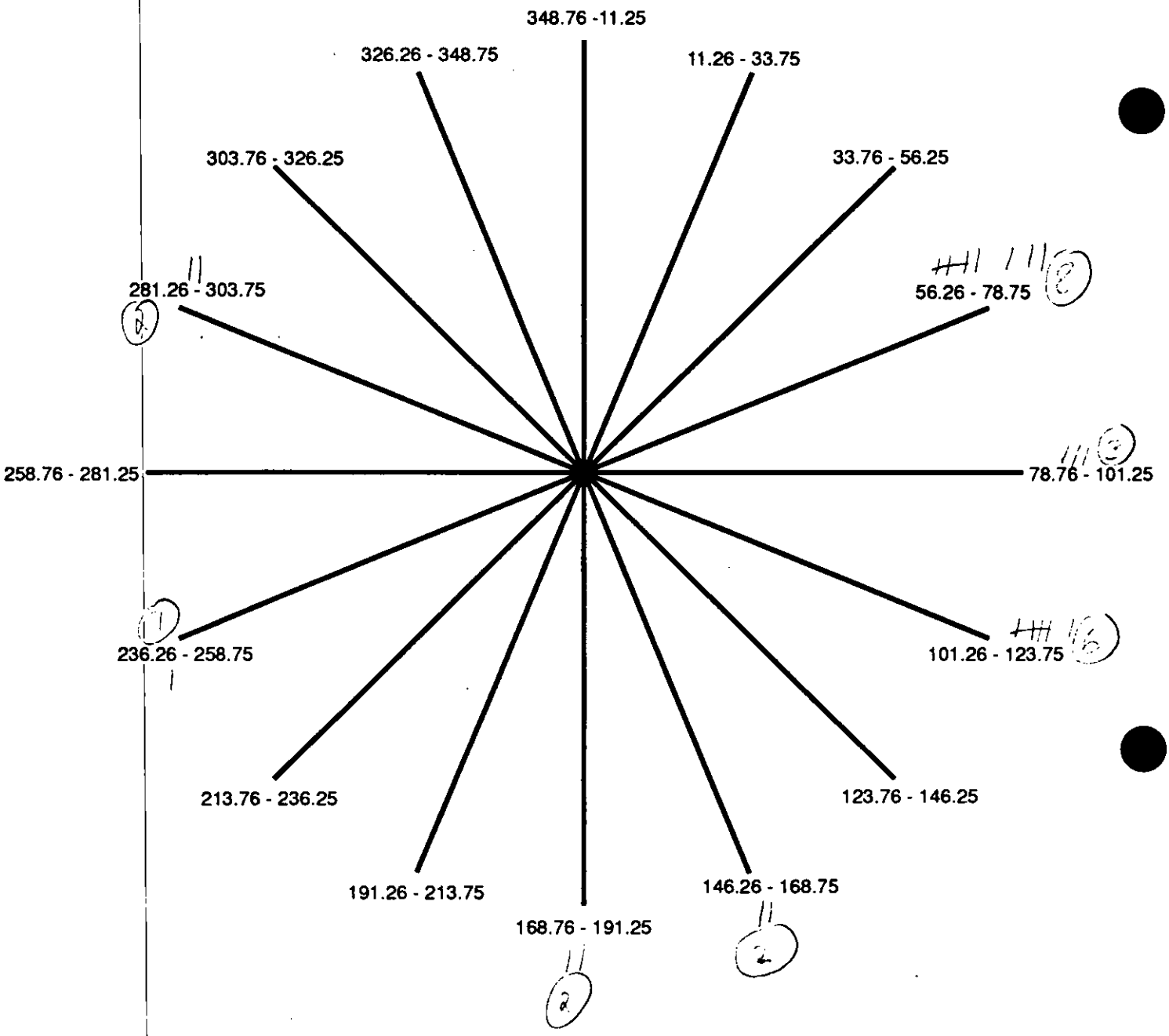
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-17-92

CONCENTRATION: 23.5 ug/M^3

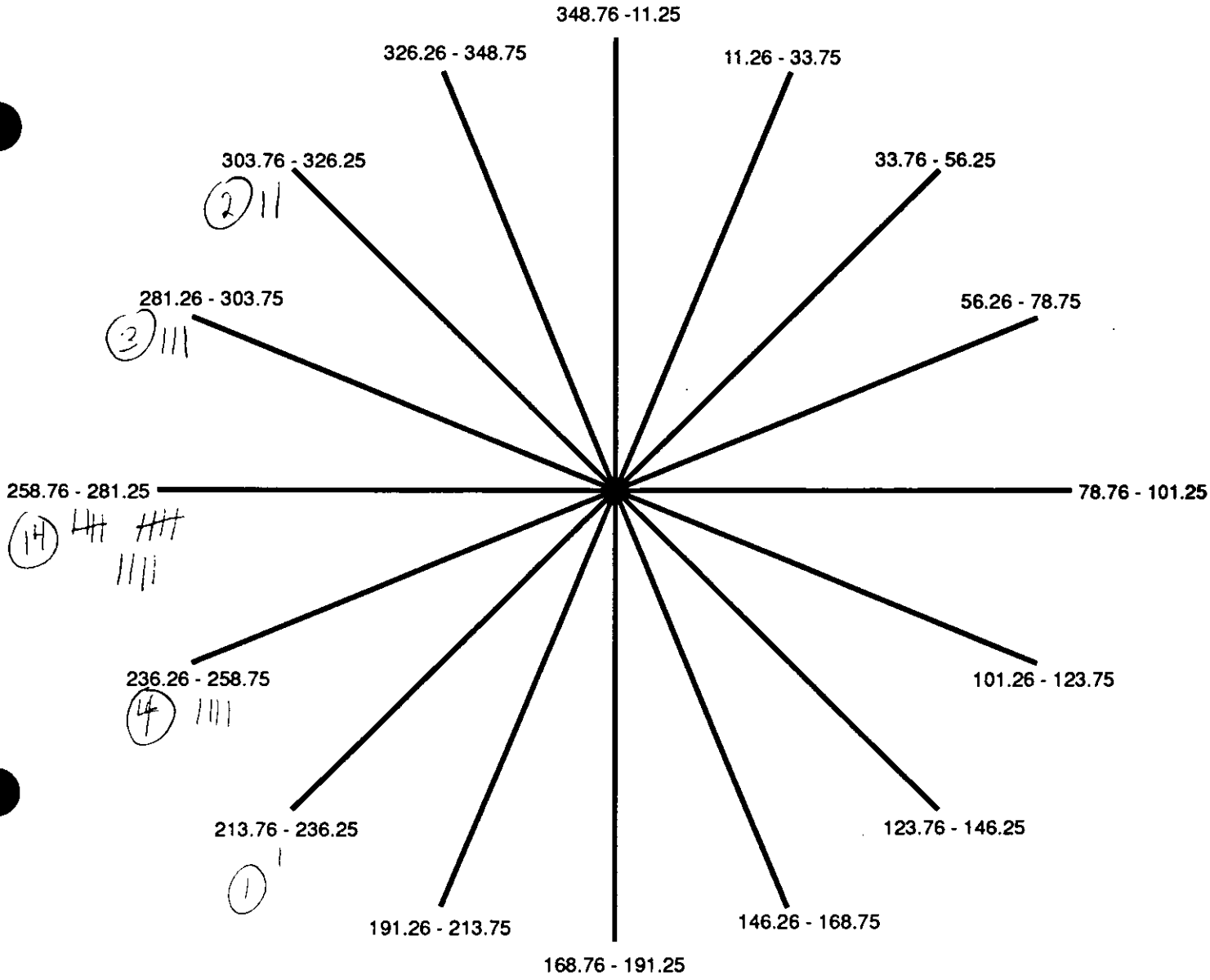
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-25-92

CONCENTRATION: 170? ug/M^3

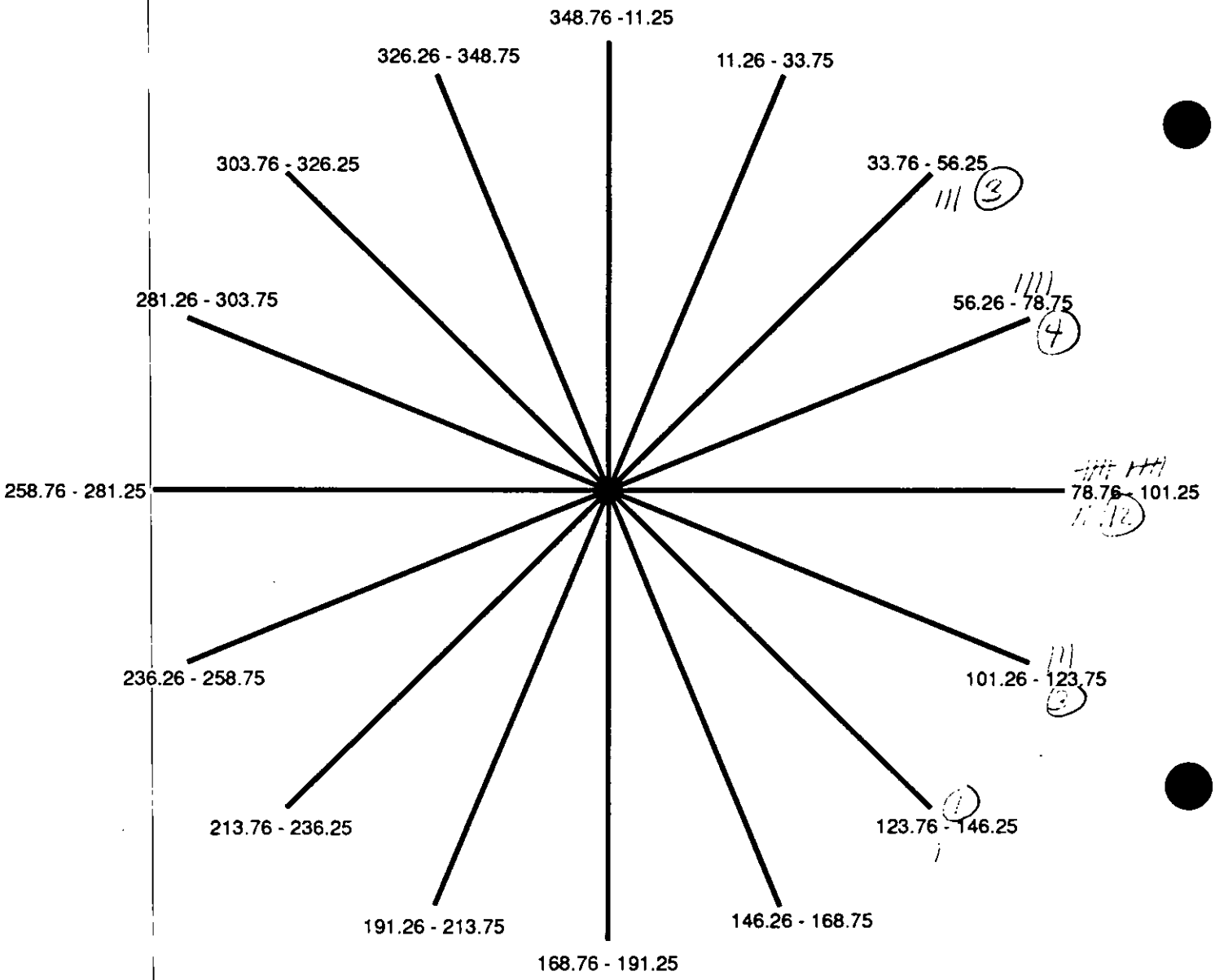
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-31-92

CONCENTRATION: 203 ug/M^3

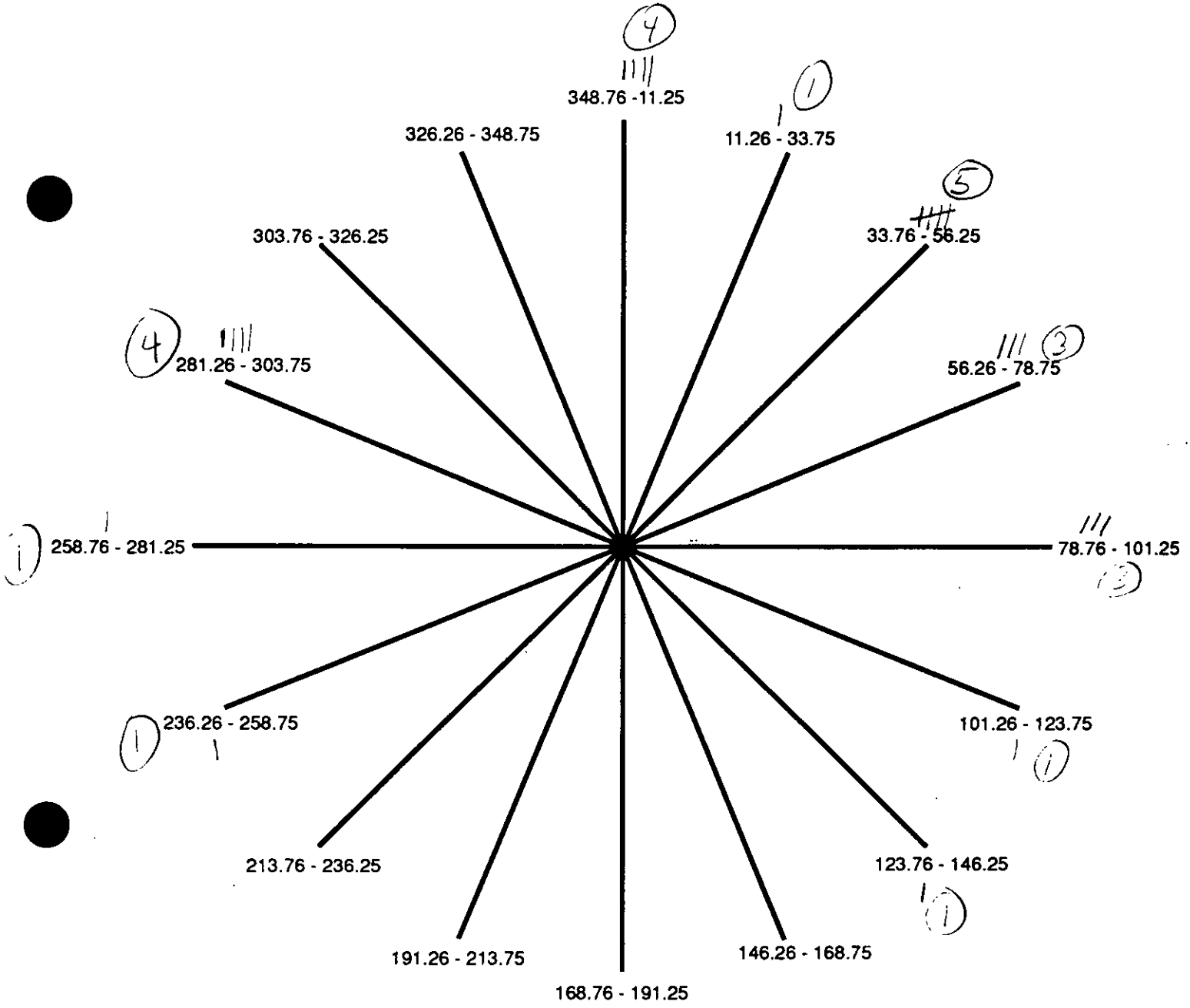
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 4-6-92

CONCENTRATION: 24.4 ug/M^3

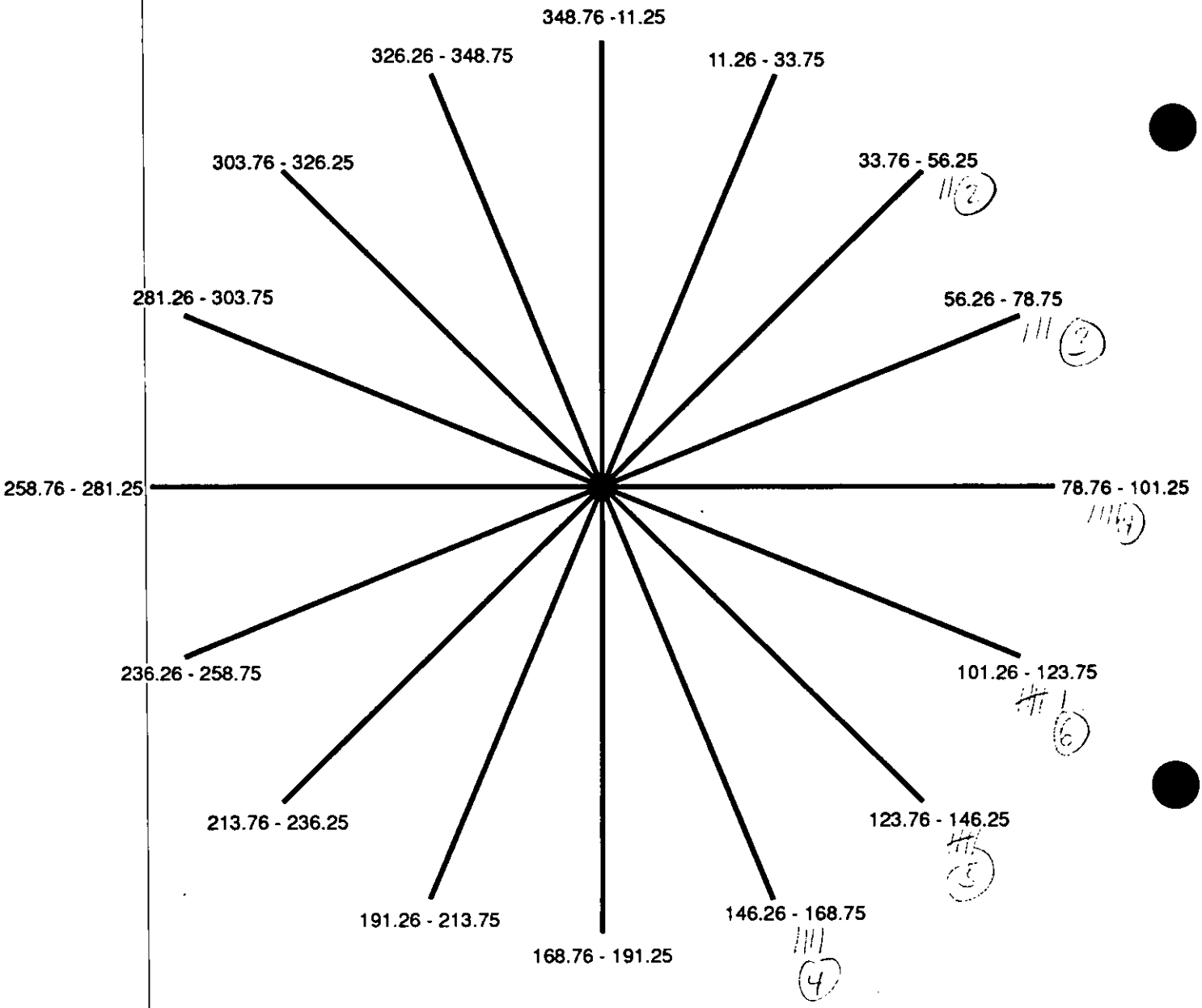
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 4-12-92

CONCENTRATION: 9.9 ug/M^3

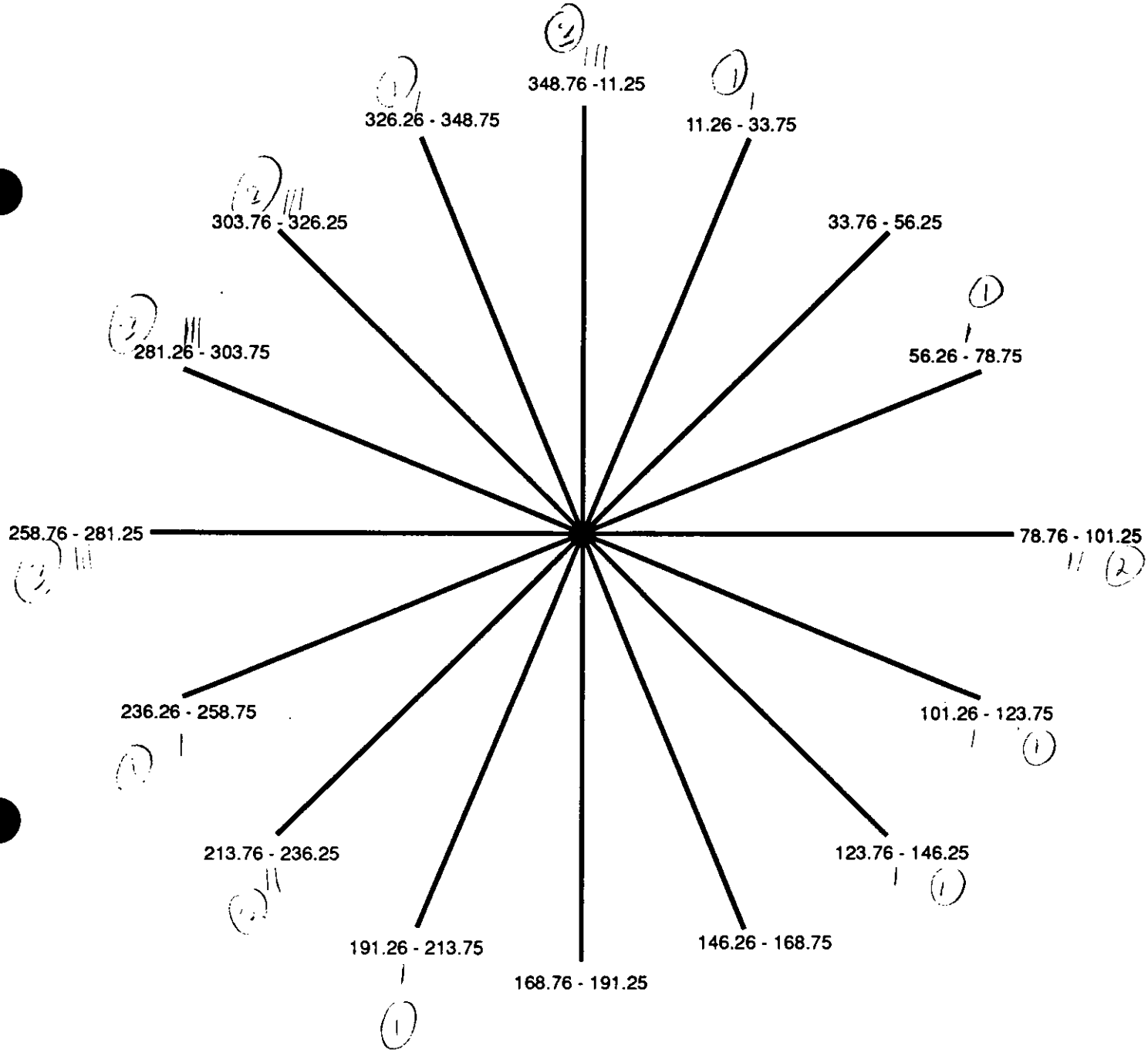
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 4-18-92

CONCENTRATION: 14.2 ug/M^3

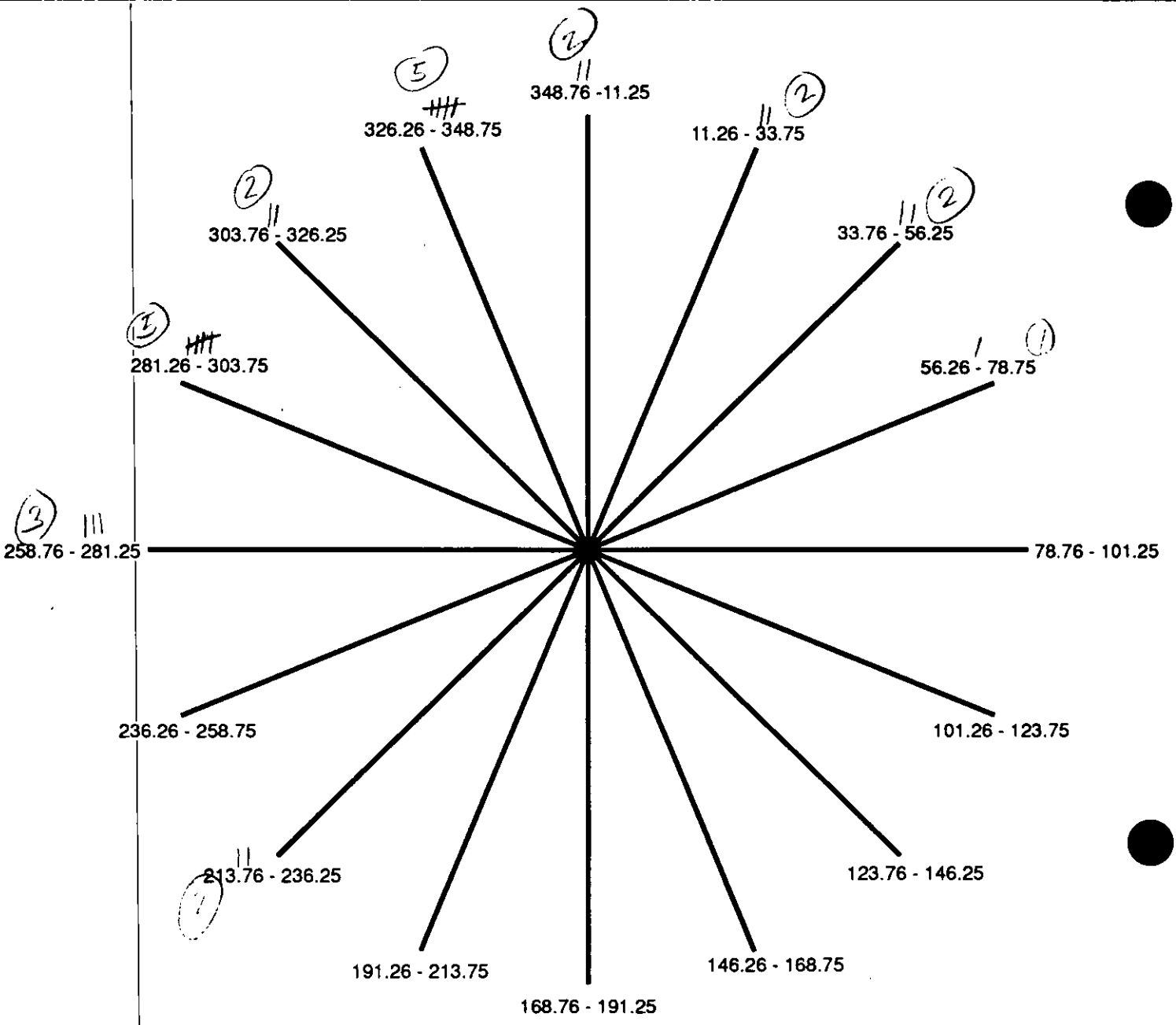
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 4-24-92

CONCENTRATION: 27.3 ug/M^3

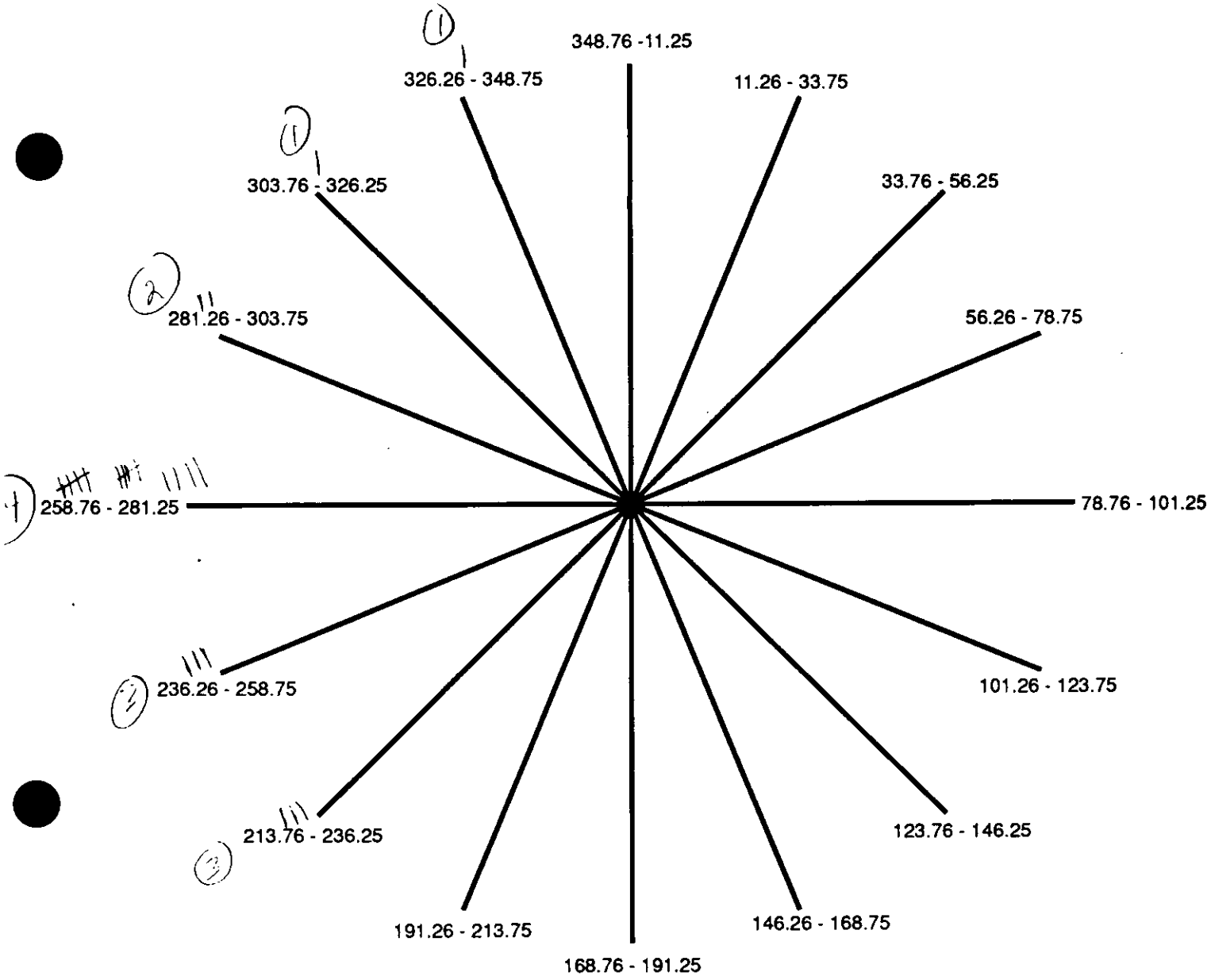
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 4-30-92

CONCENTRATION: 43.9 ug/M^3

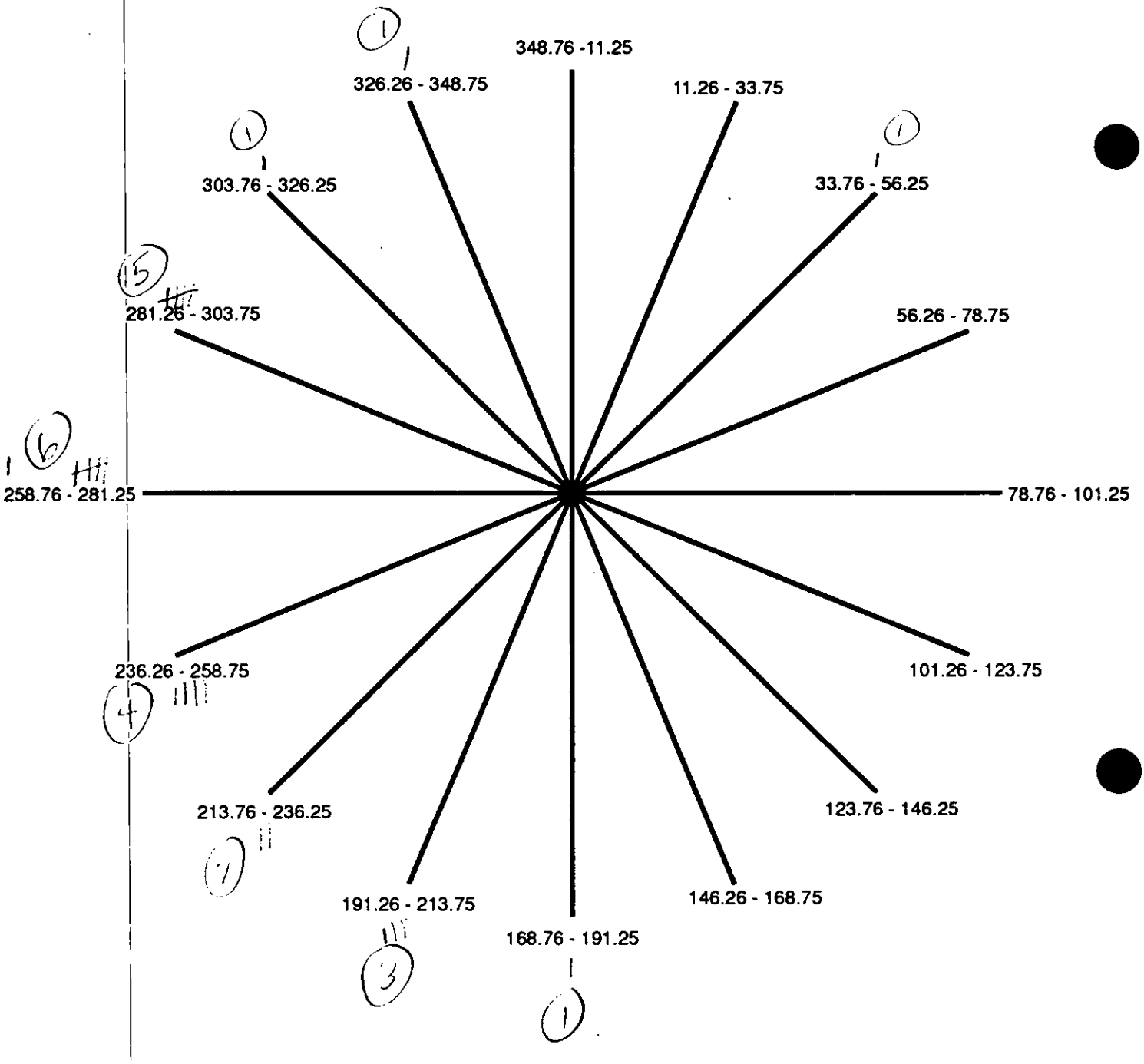
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-6-92

CONCENTRATION: 34.9 ug/M^3

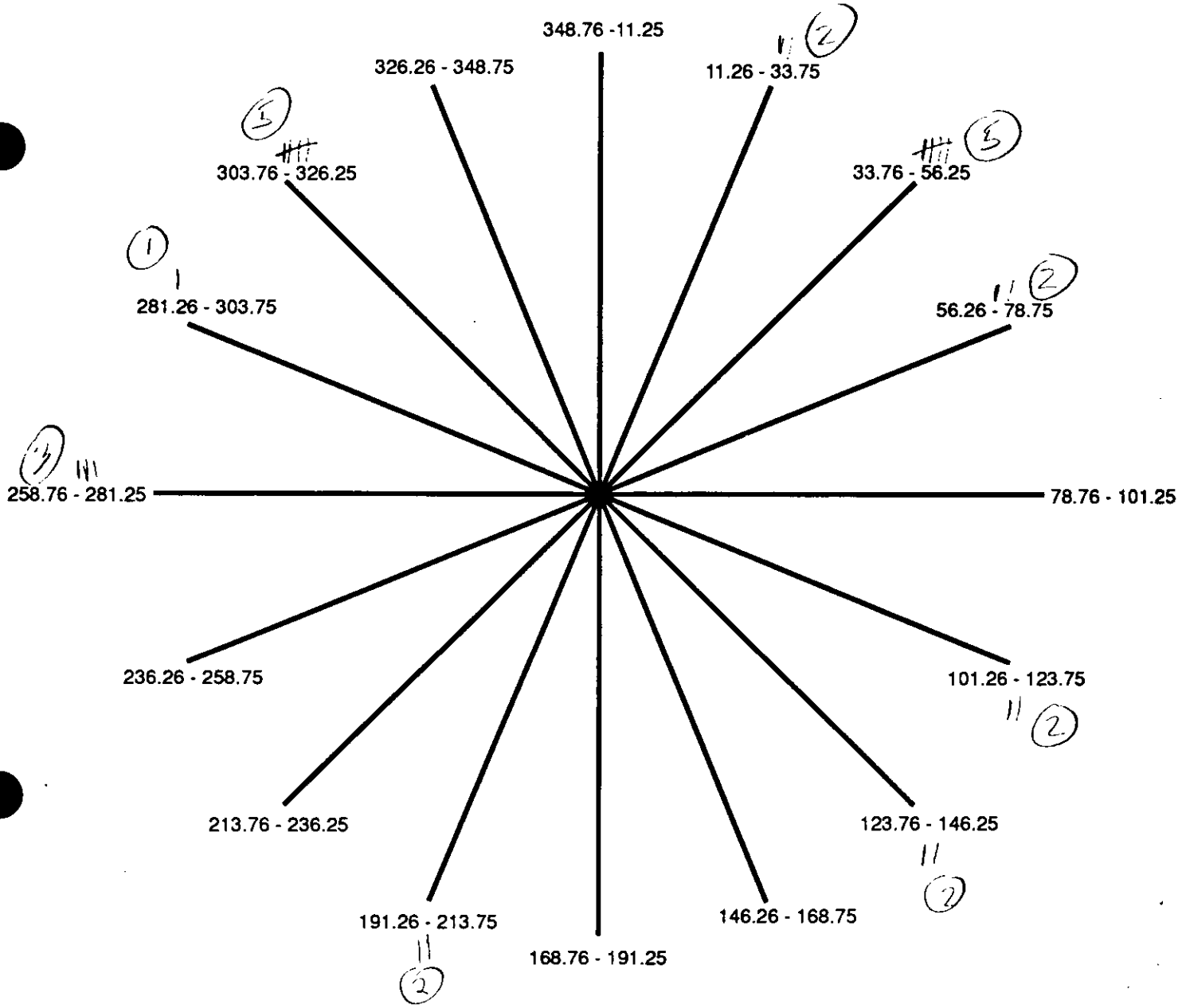
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-8-92

CONCENTRATION: 27.4 ug/M^3

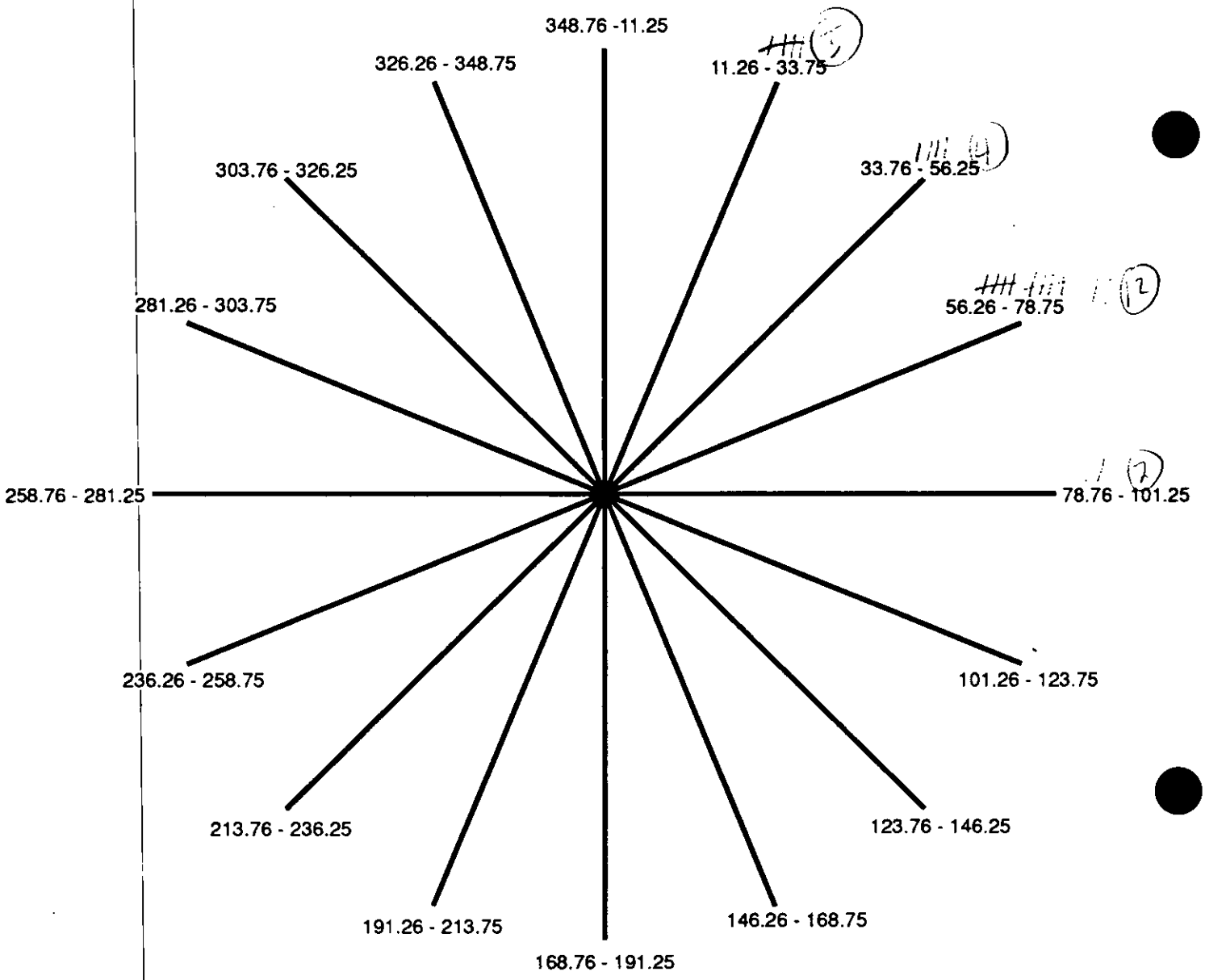
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-12-92

CONCENTRATION: 35.0 ug/M^3

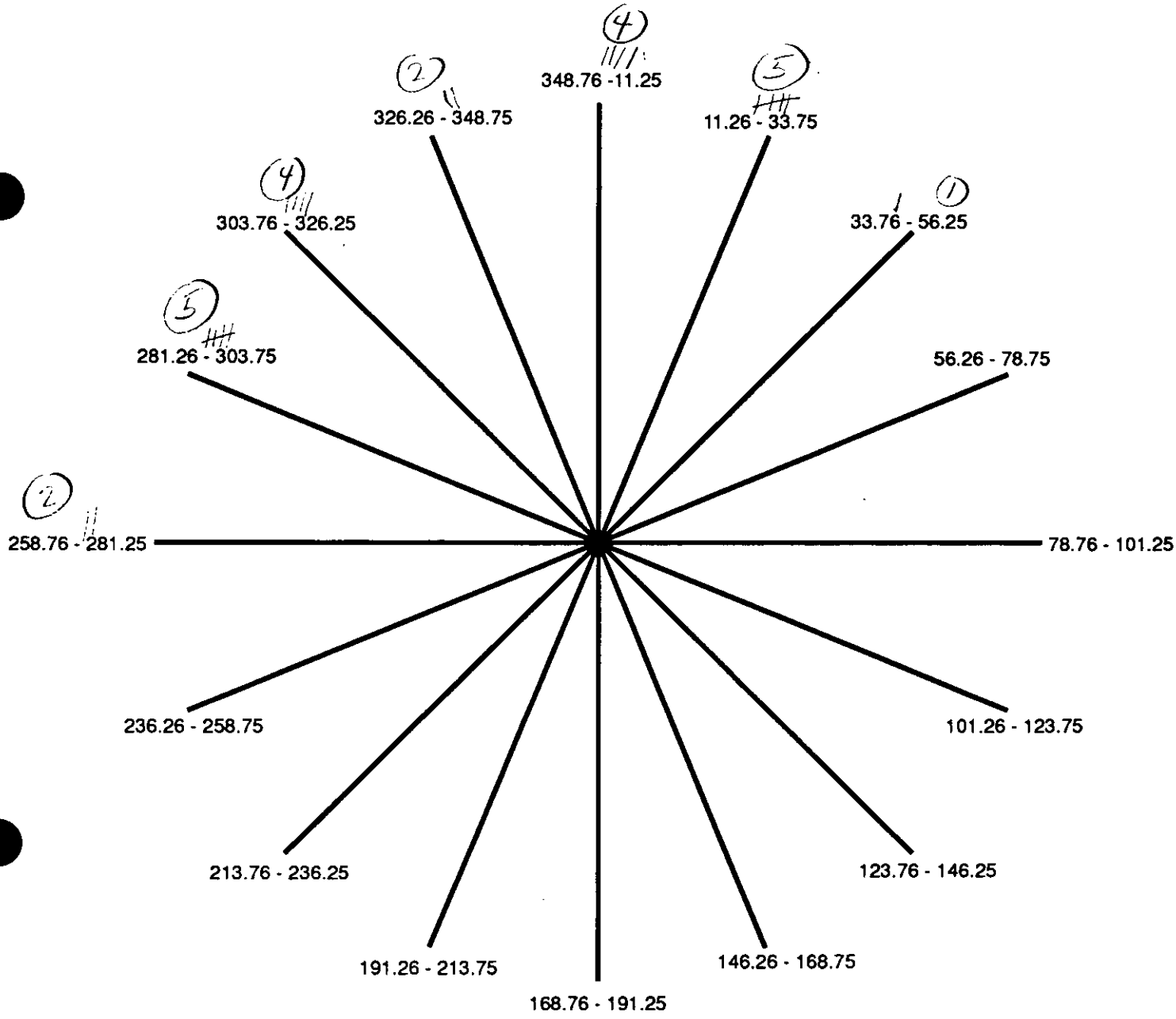
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-18-92

CONCENTRATION: 10.2 ug/M^3

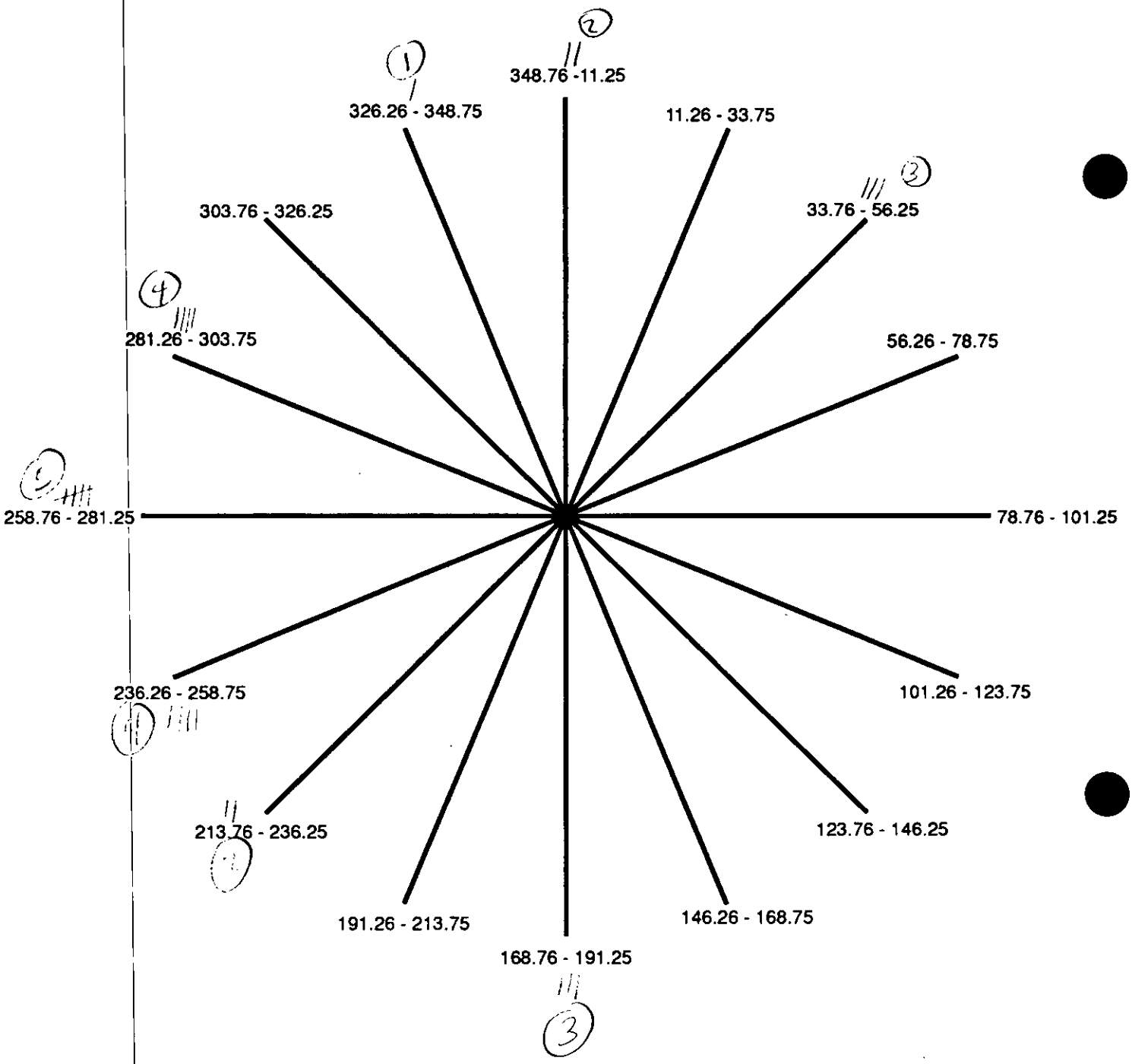
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-24-92

CONCENTRATION: 204 ug/M^3

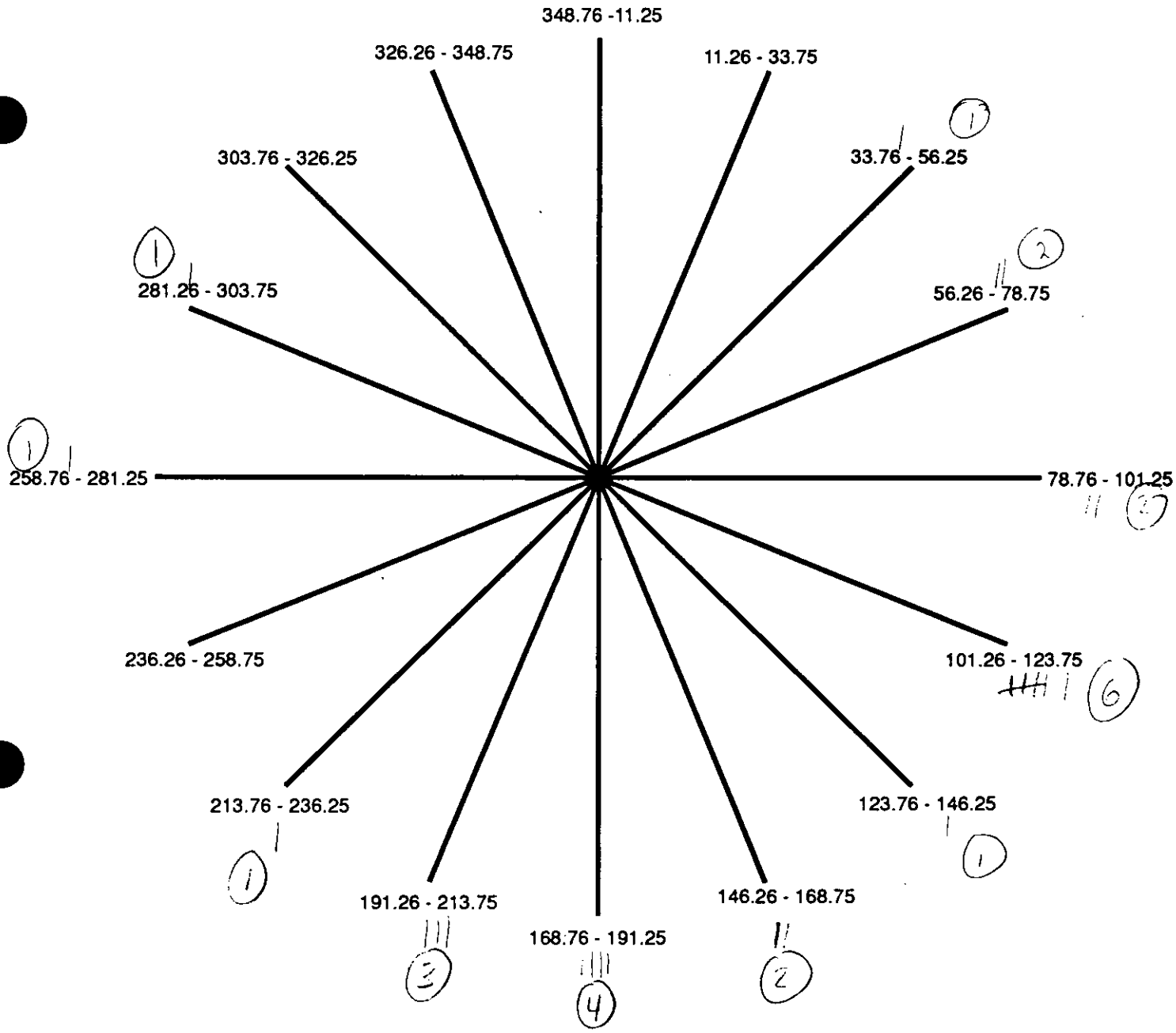
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-27-92

CONCENTRATION: 30.8 ug/M^3

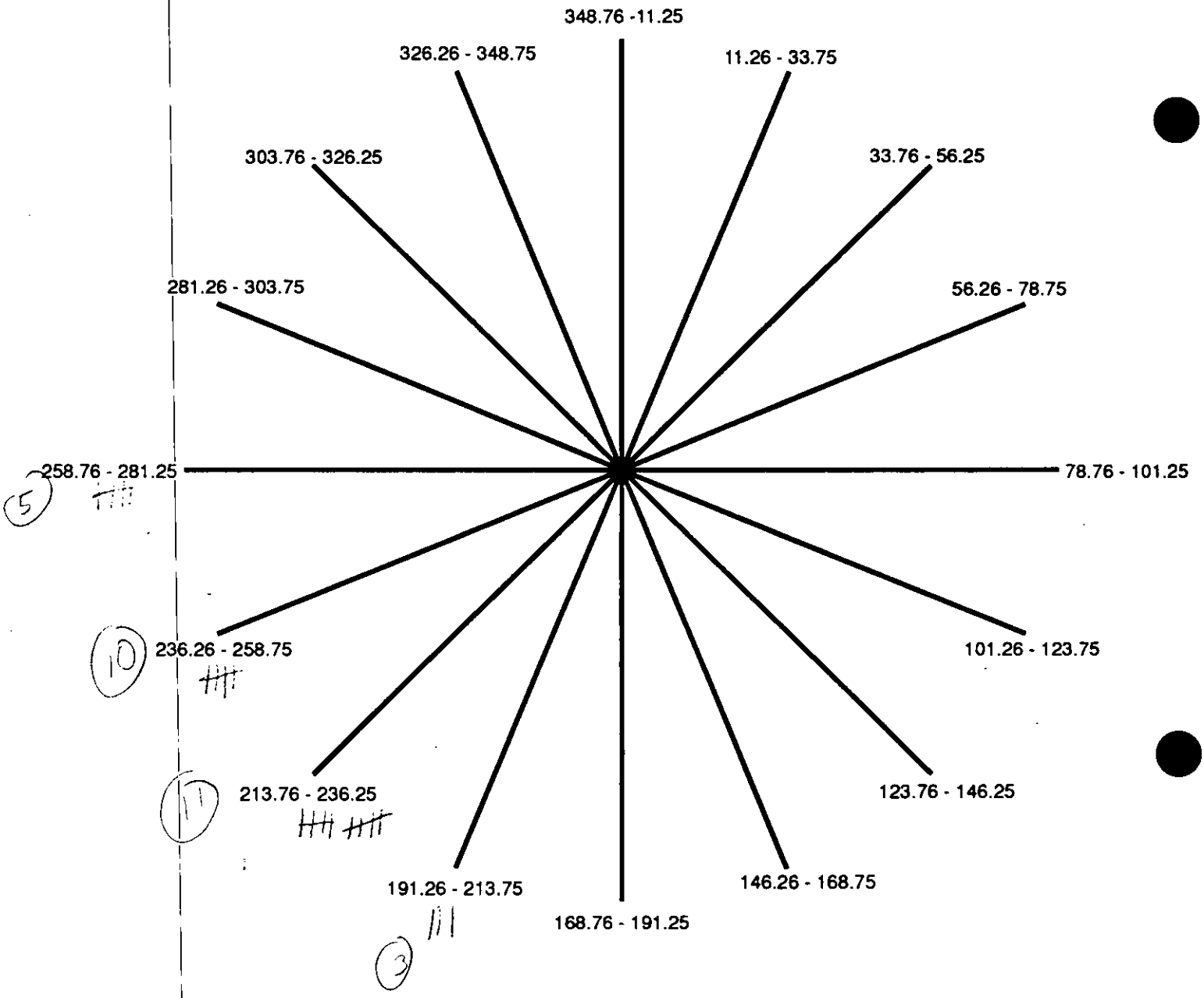
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-30-92

CONCENTRATION: 150.4 ug/M^3

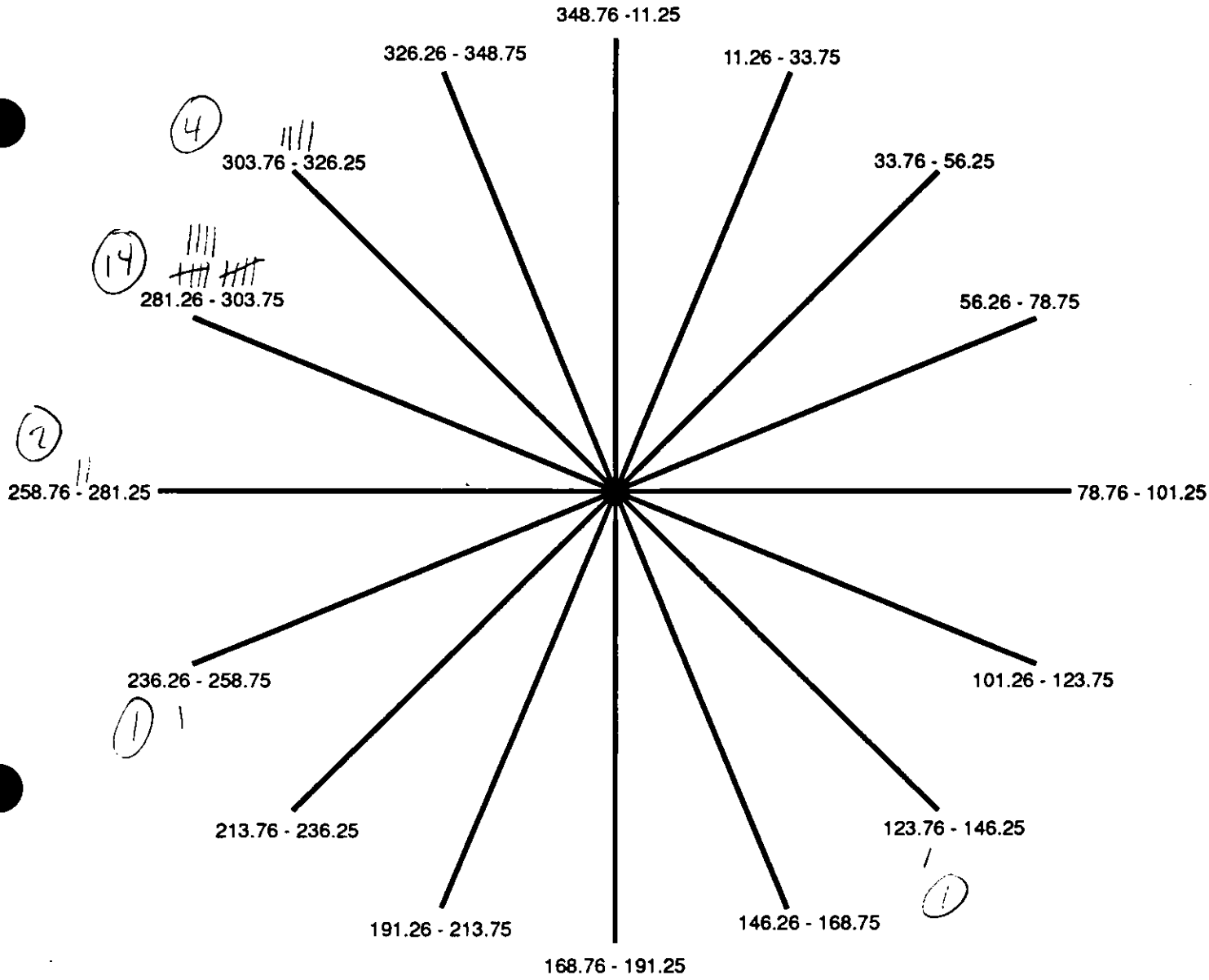
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 6-5-92

CONCENTRATION: 33.8 ug/M^3

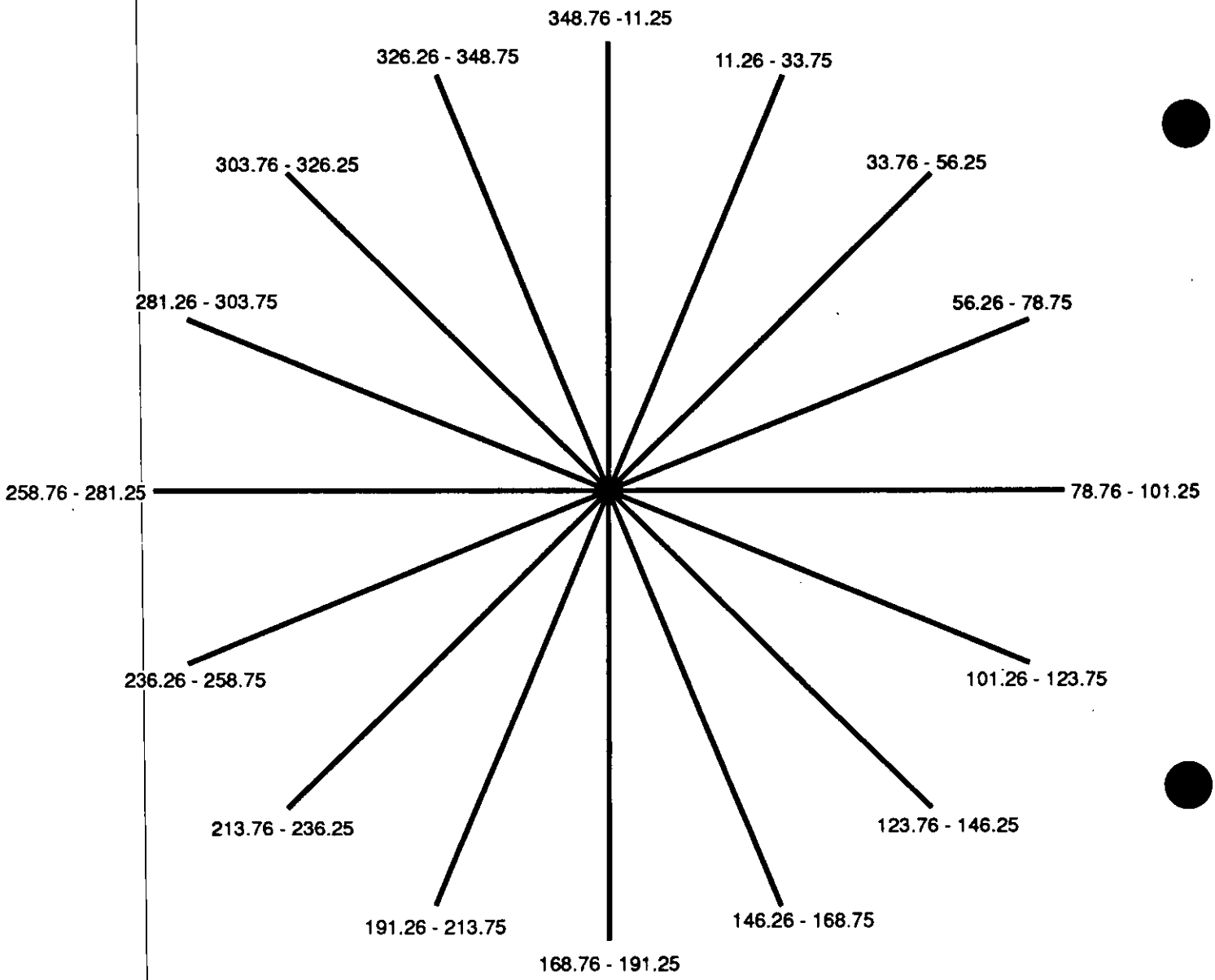
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 6-11-92

CONCENTRATION: 2206 ug/M^3

SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE

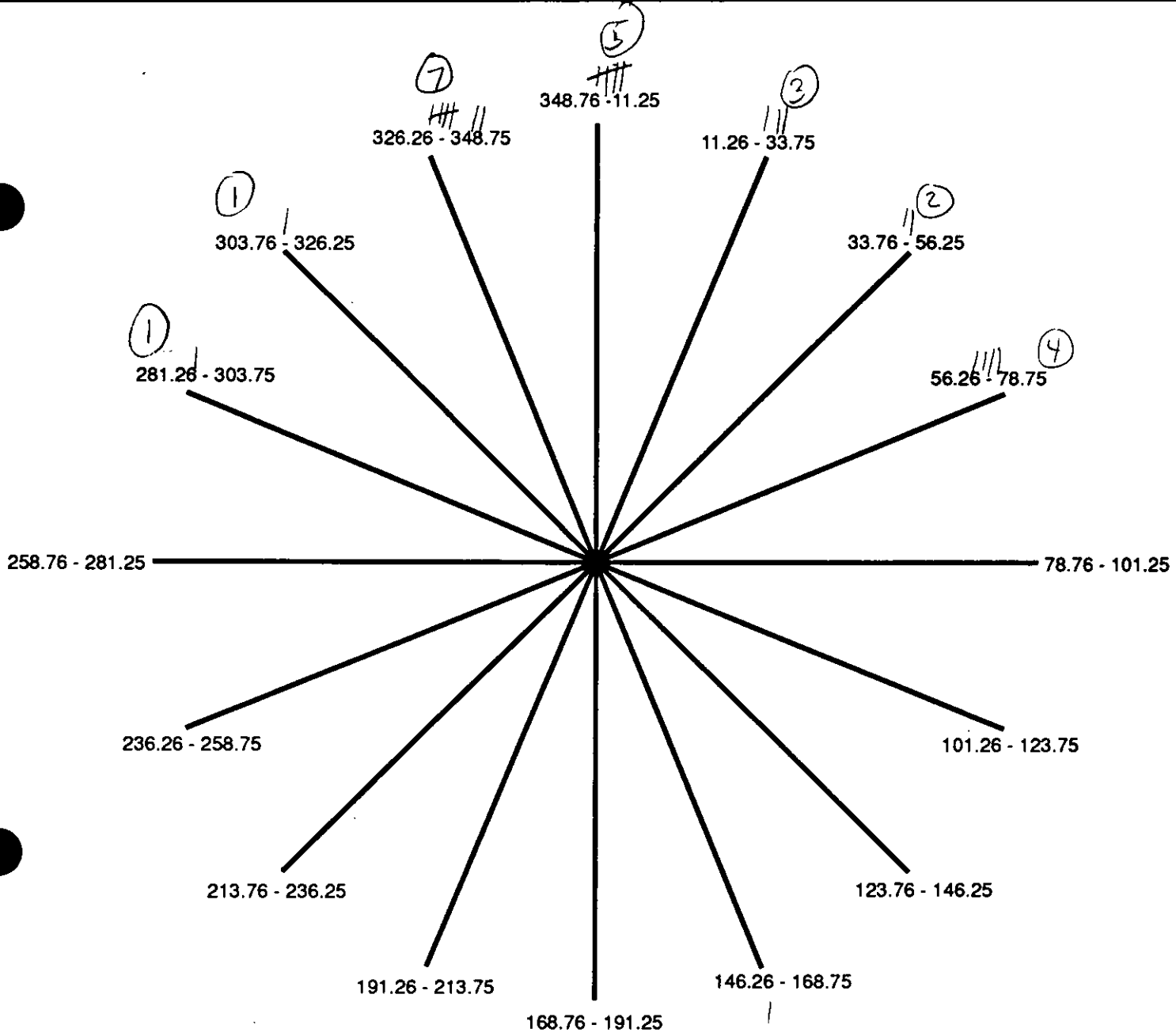


NO WIND DATA AVAILABLE

DATE: 6-19-92

CONCENTRATION: 125 ug/M^3

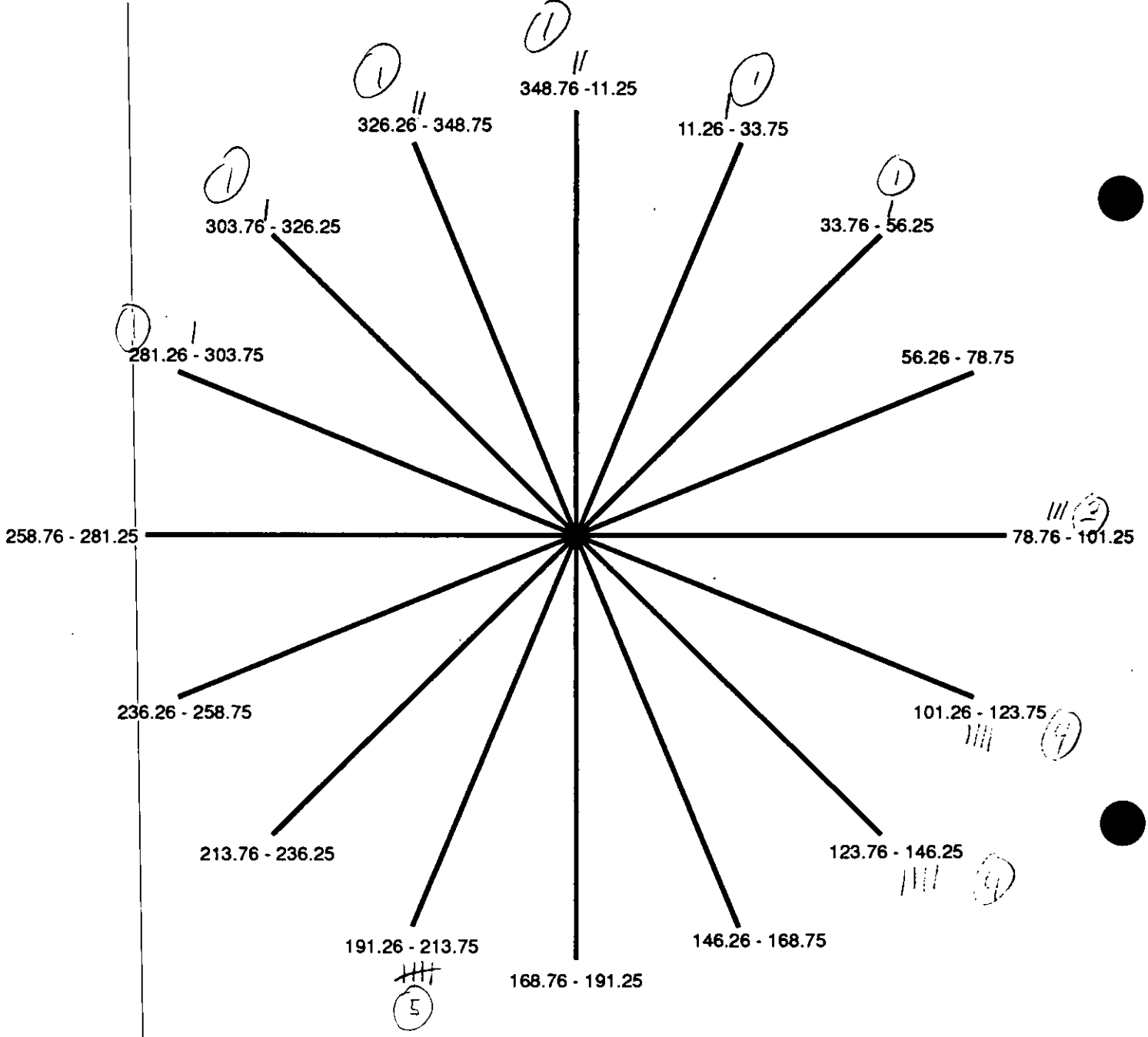
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 7-5-92

CONCENTRATION: 20.9 ug/M^3

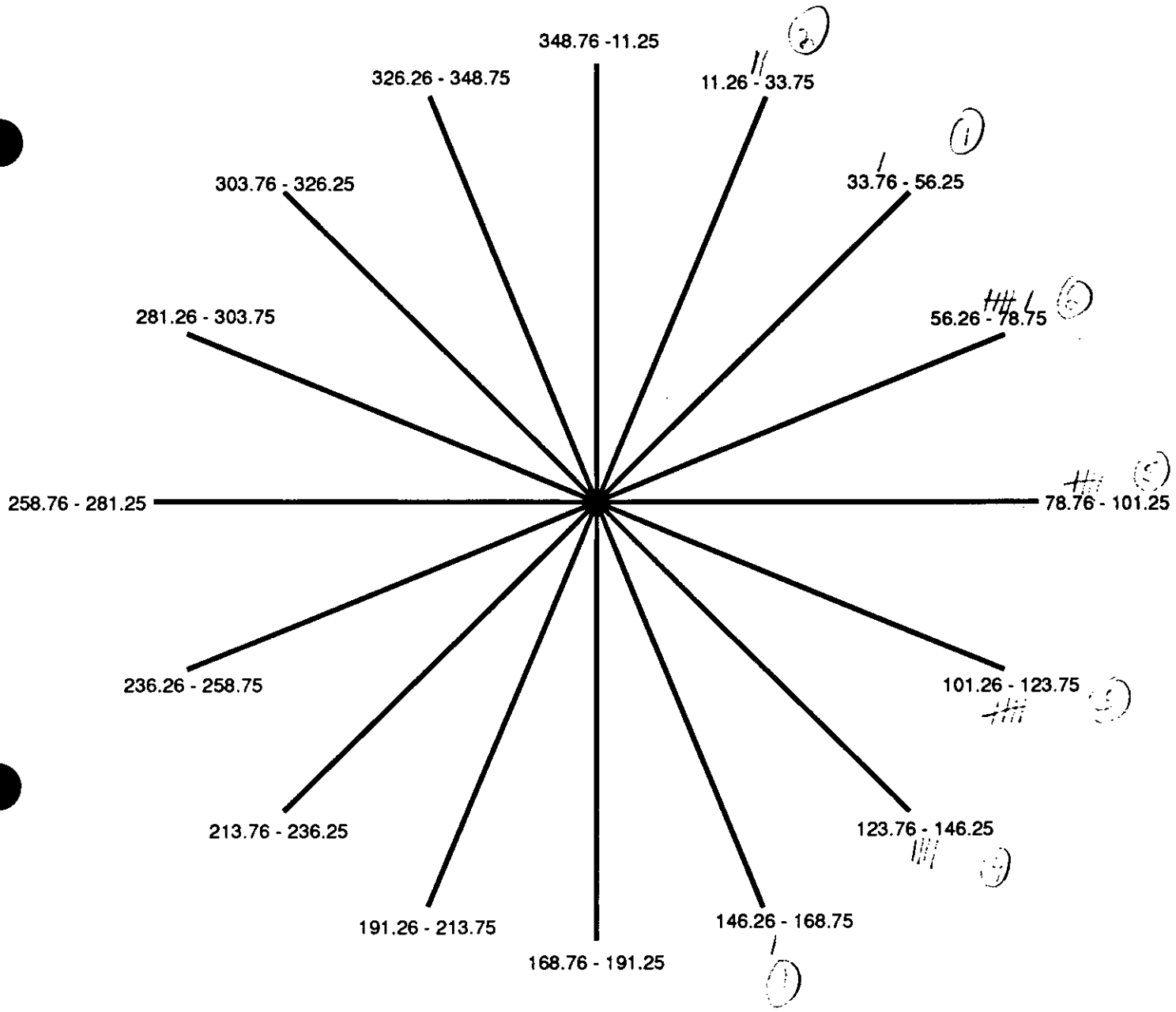
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 7-11-92

CONCENTRATION: 40.6 ug/M^3

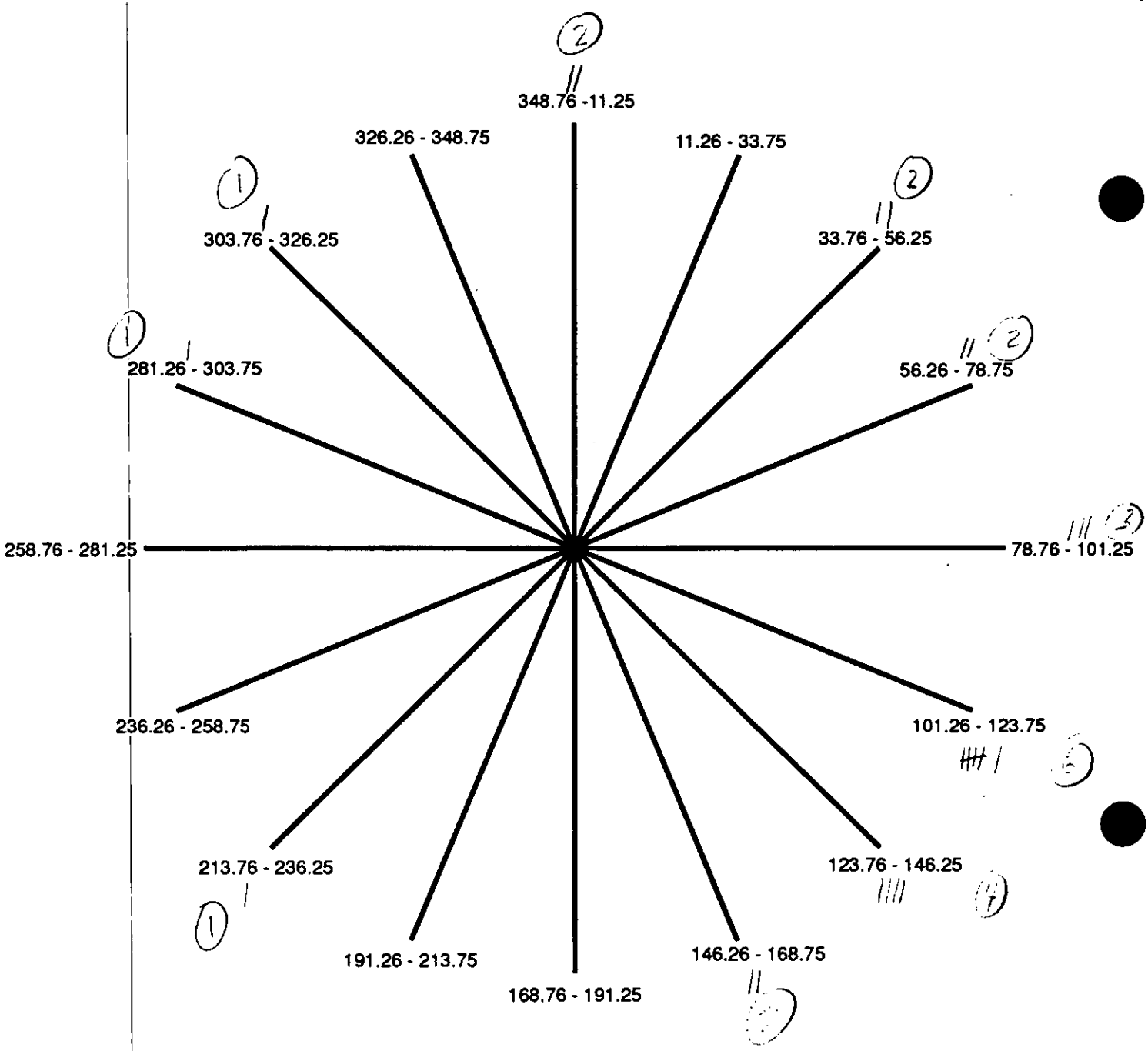
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 7-17-92

CONCENTRATION: 120.4 ug/M^3

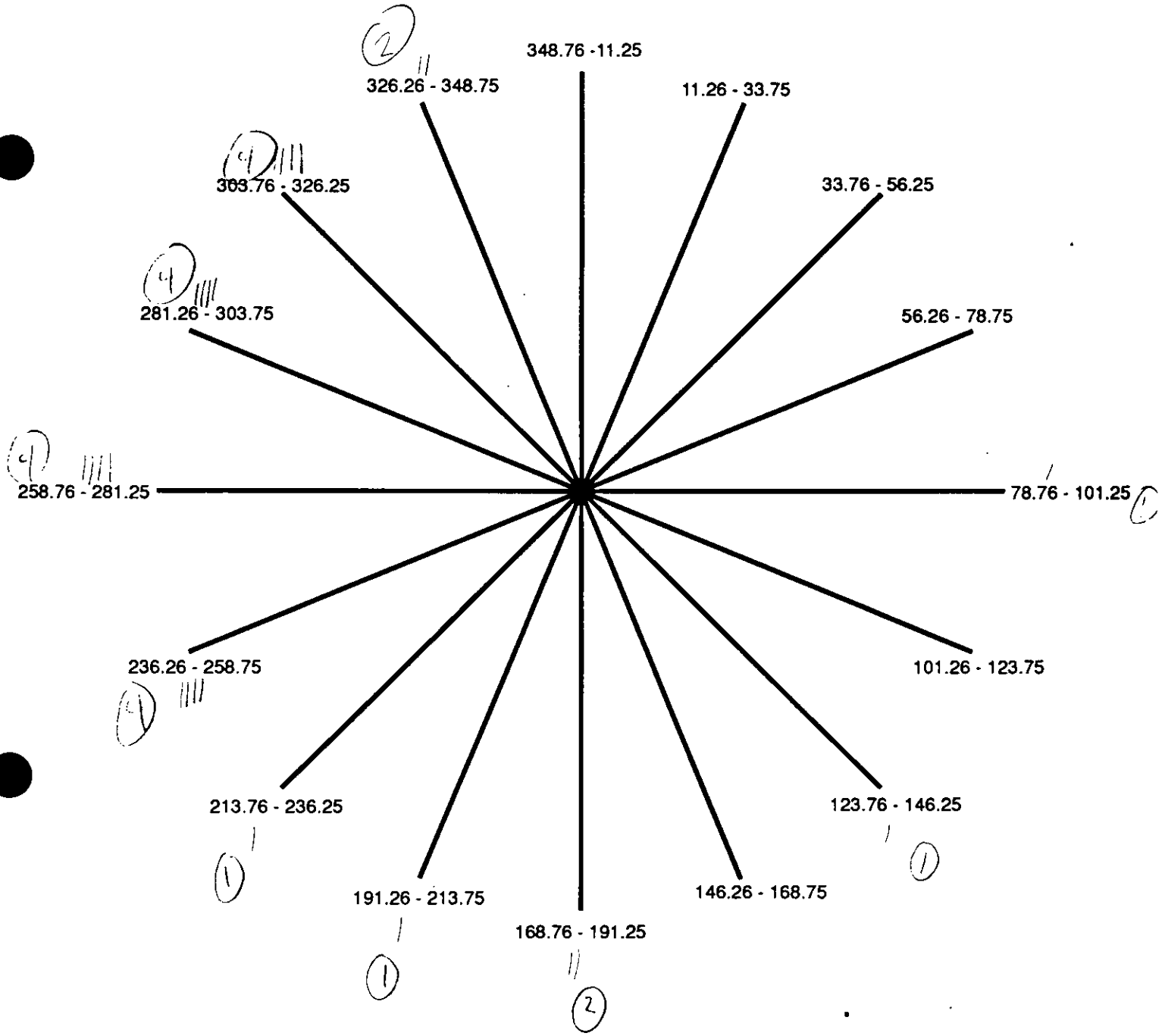
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 7-23-92

CONCENTRATION: 160.9 ug/M^3

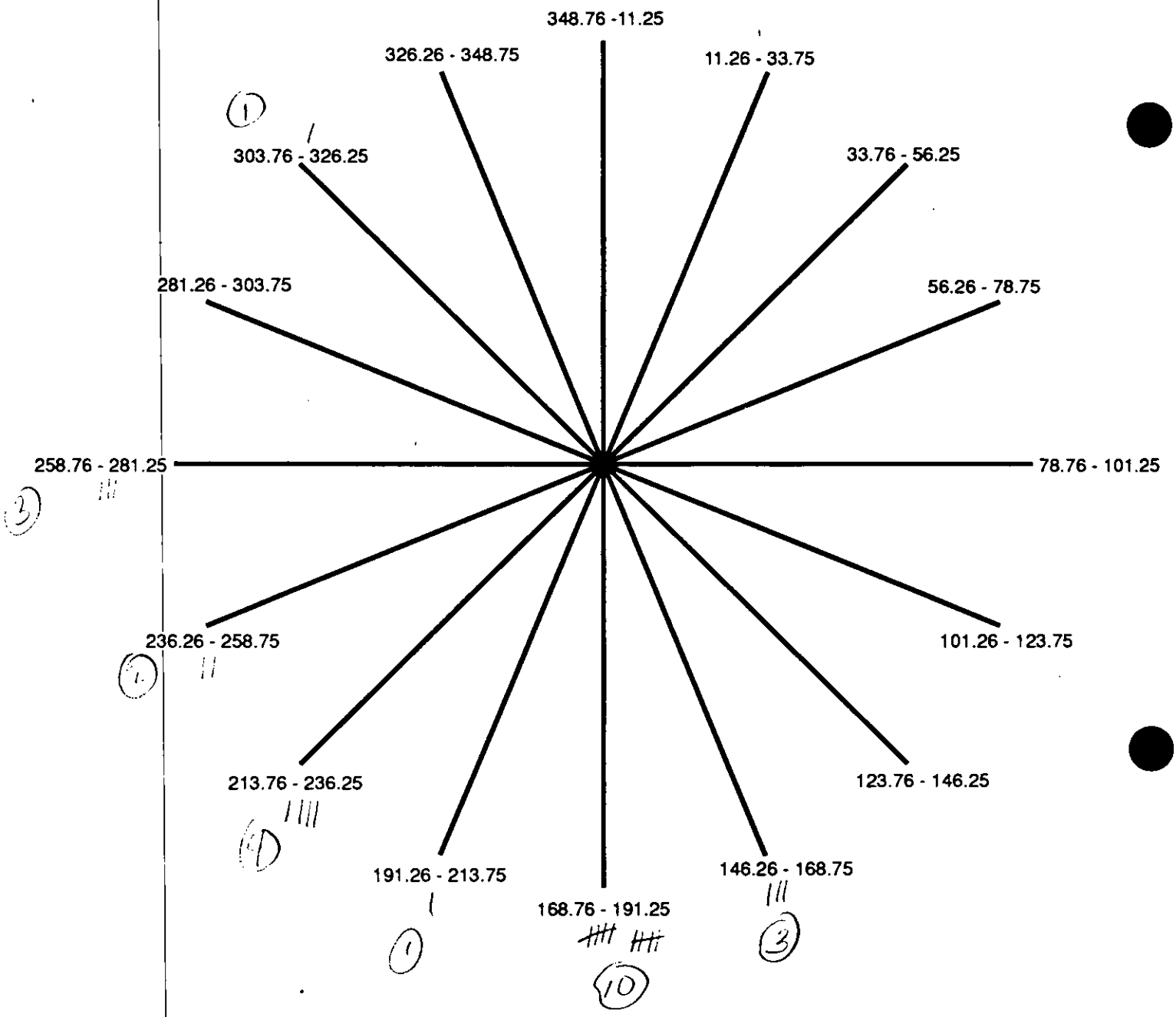
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 7-27-91

CONCENTRATION: 70.4 ug/M^3

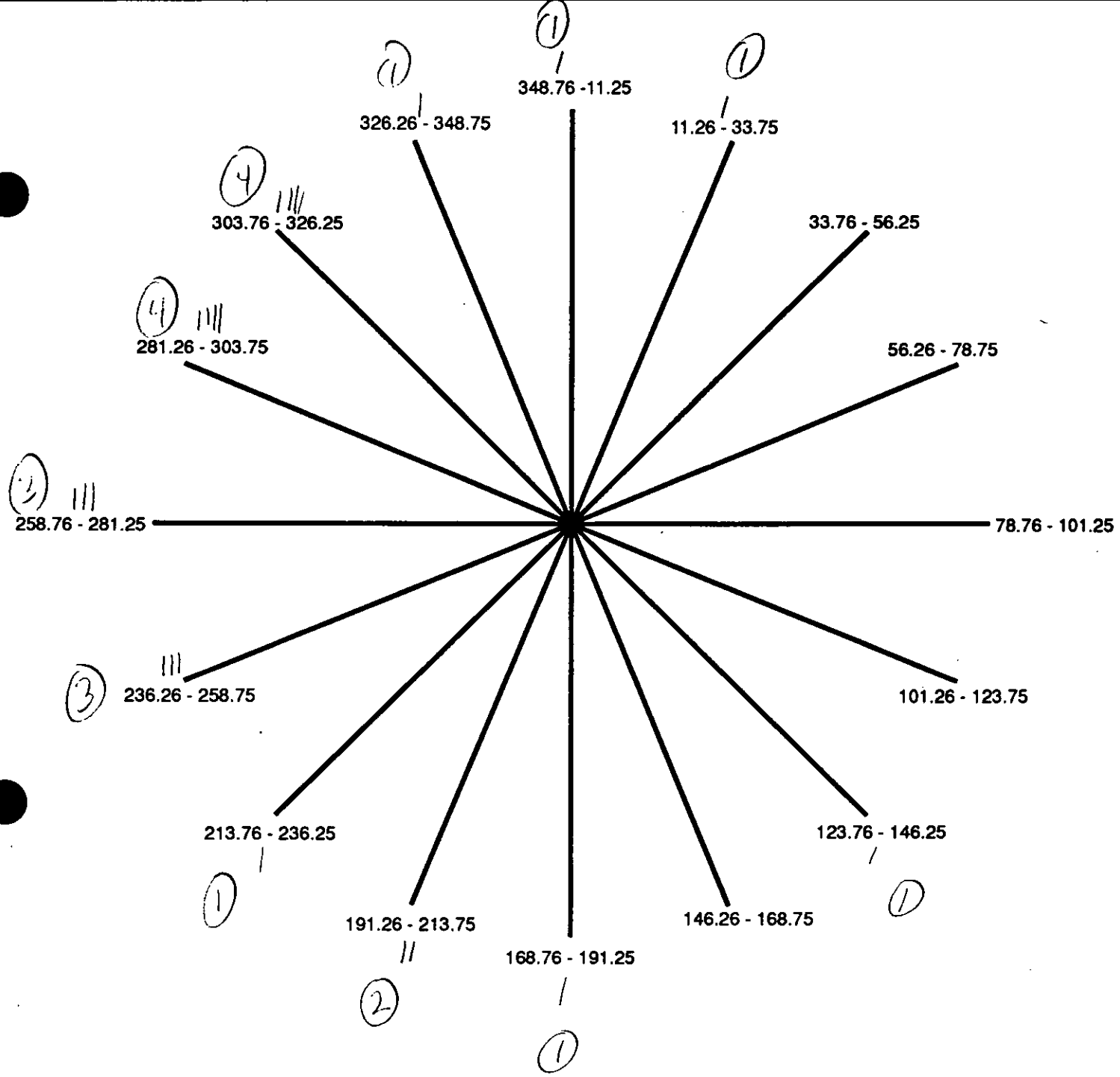
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 8-4-92

CONCENTRATION: 25.5 ug/M^3

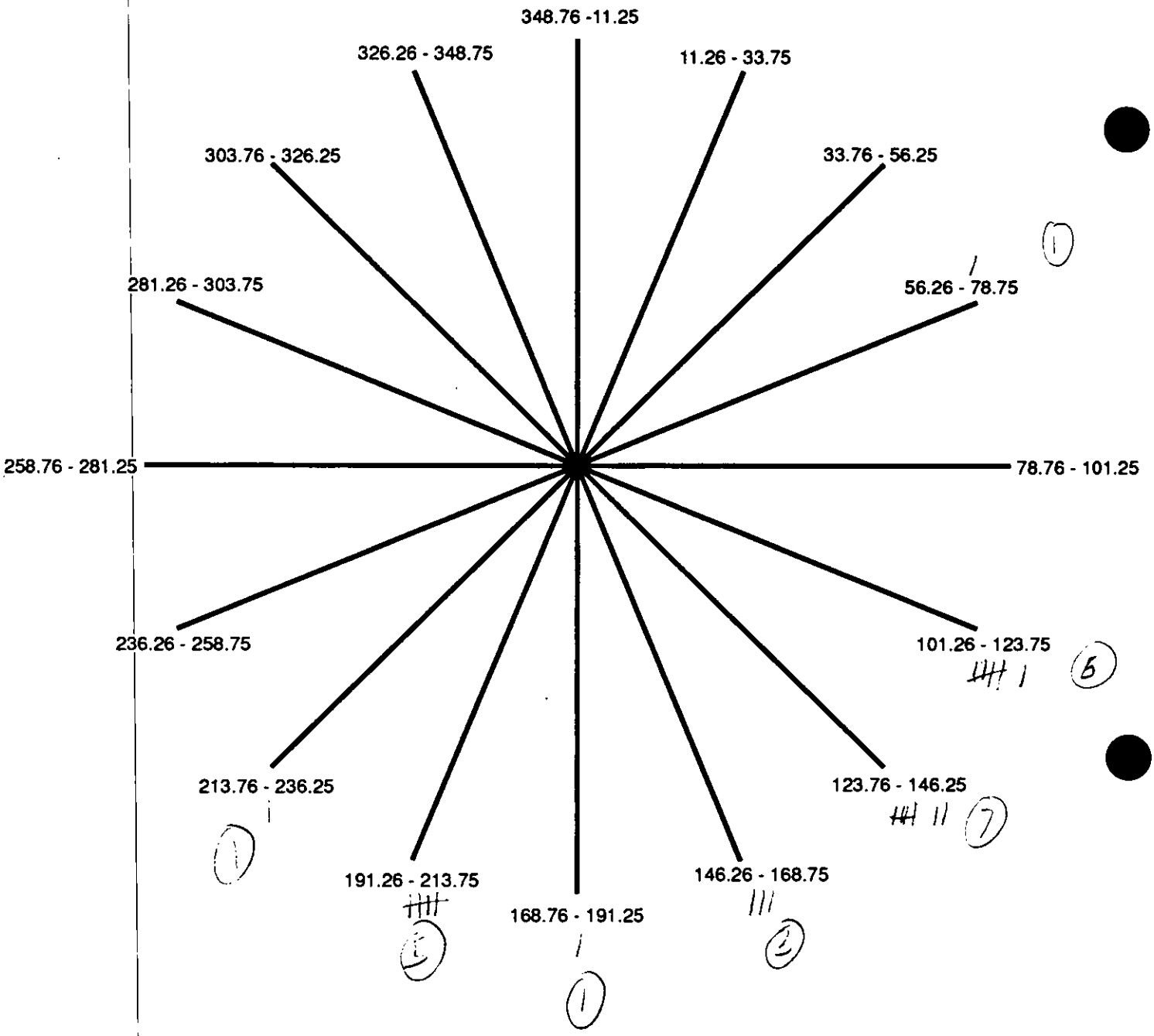
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 8-10-92

CONCENTRATION: 17.7 ug/M^3

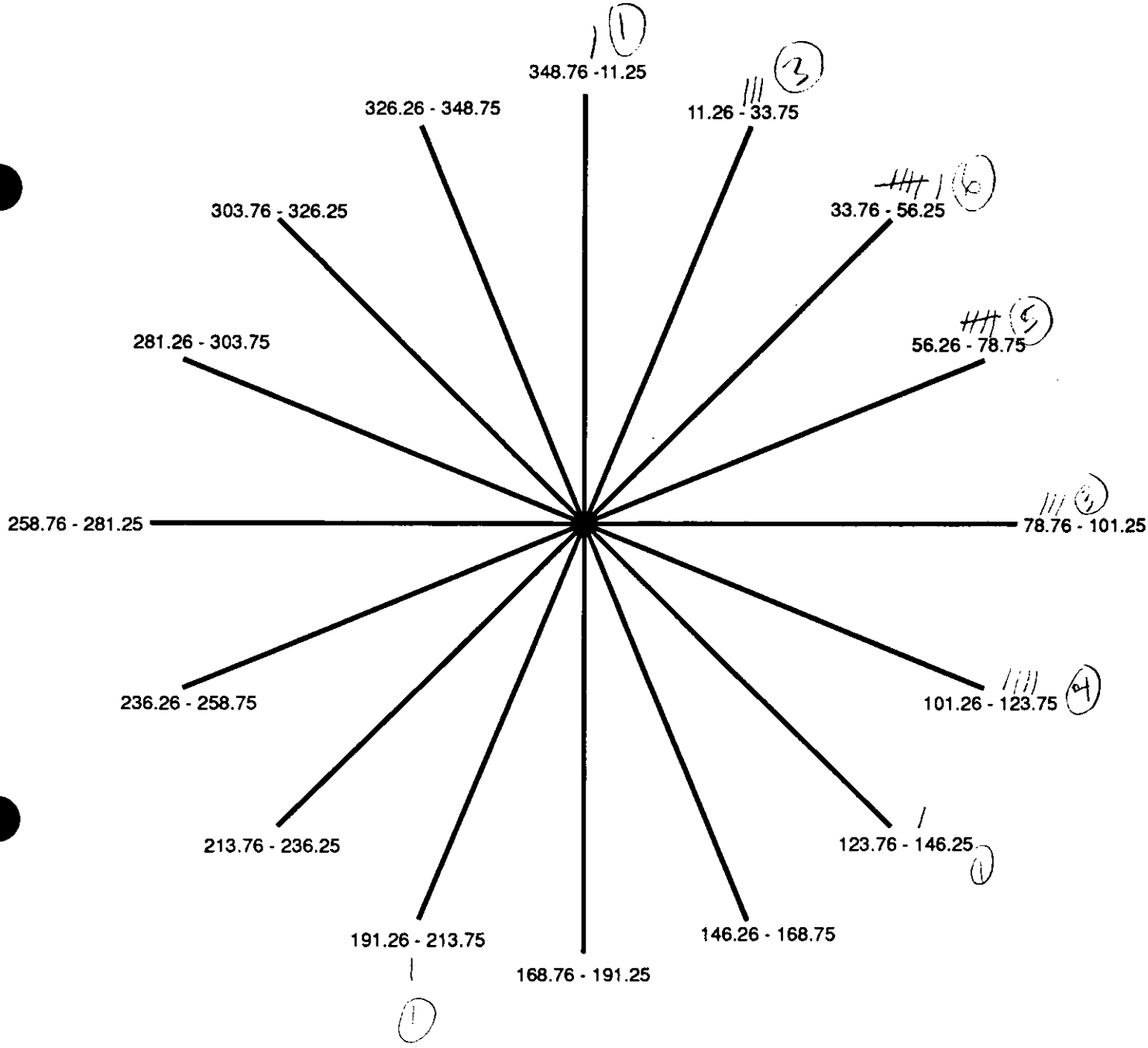
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-16-92

CONCENTRATION: 16.4 ug/M^3

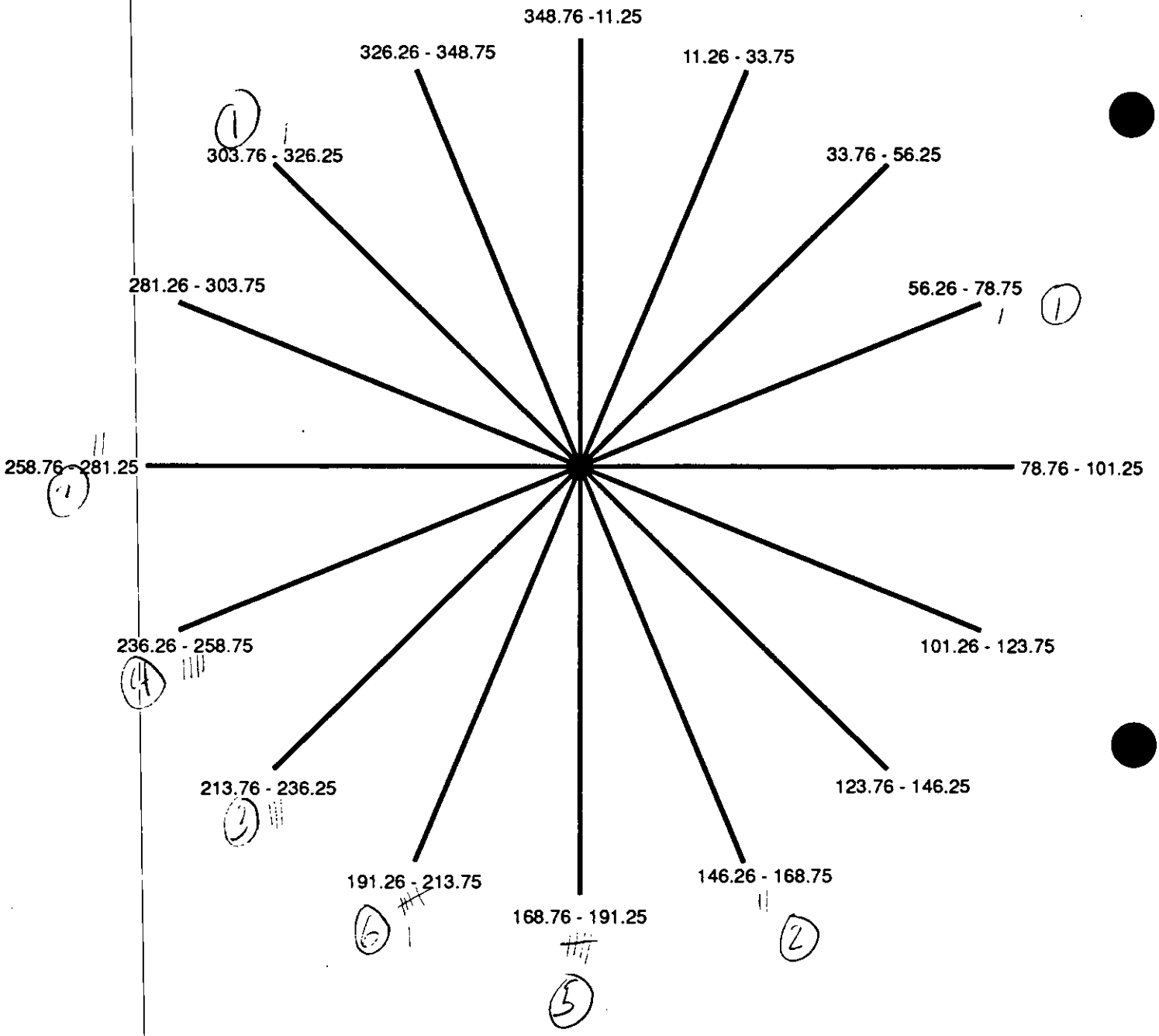
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 3-22-92

CONCENTRATION: 29 ug/M^3

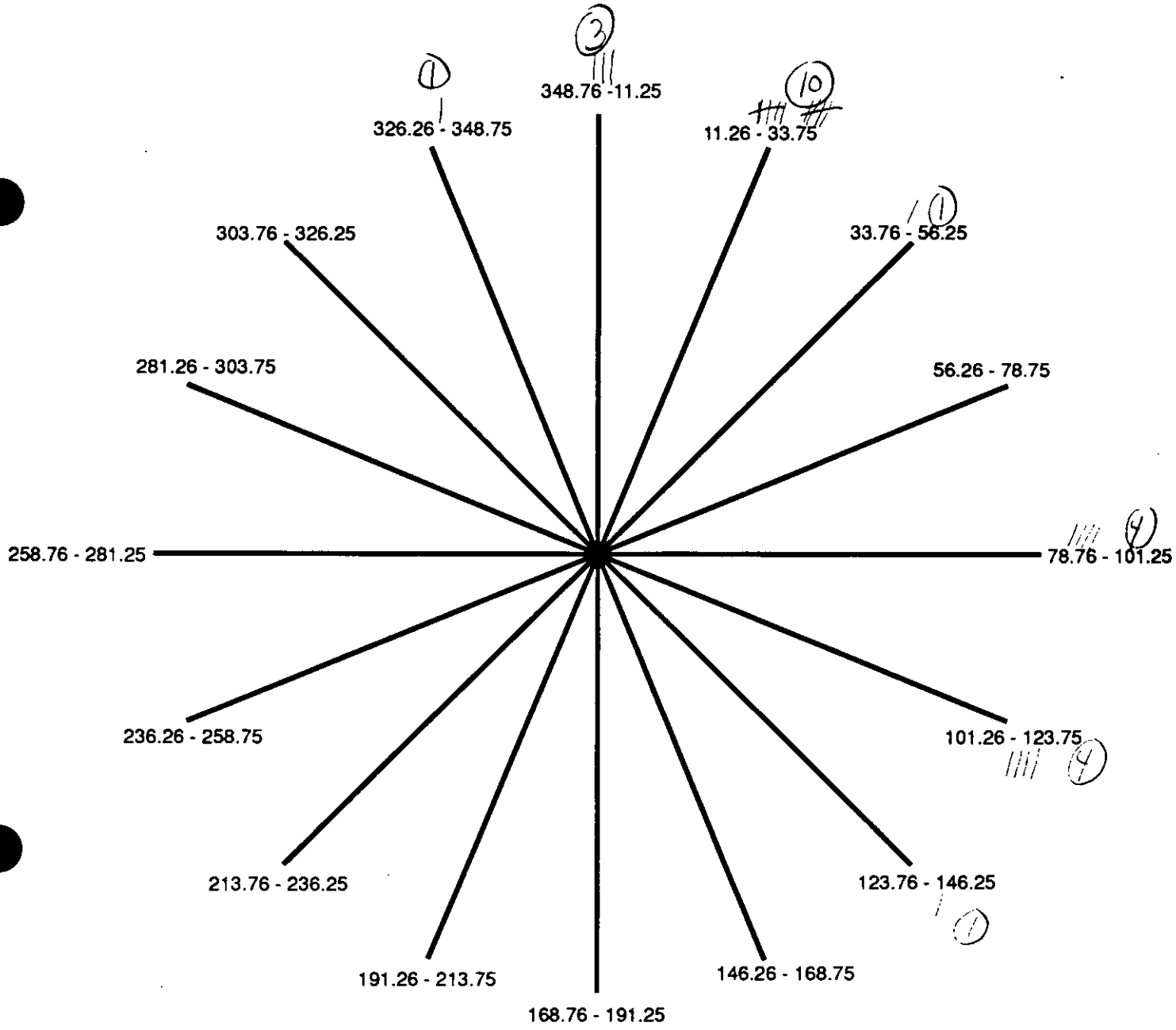
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 5-28-92

CONCENTRATION: 13.7 ug/M^3

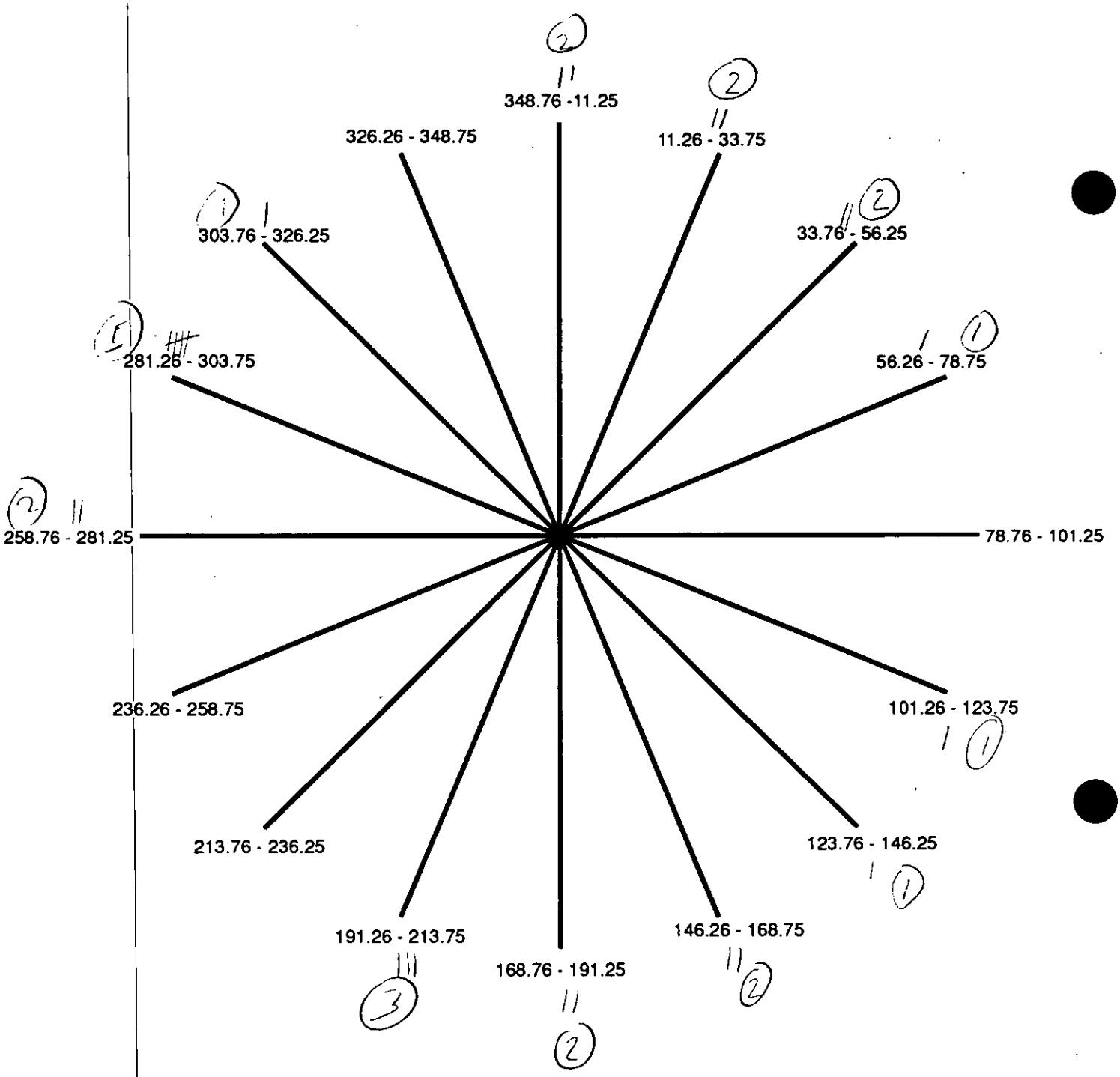
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 9-9-92

CONCENTRATION: 116.9 ug/M^3

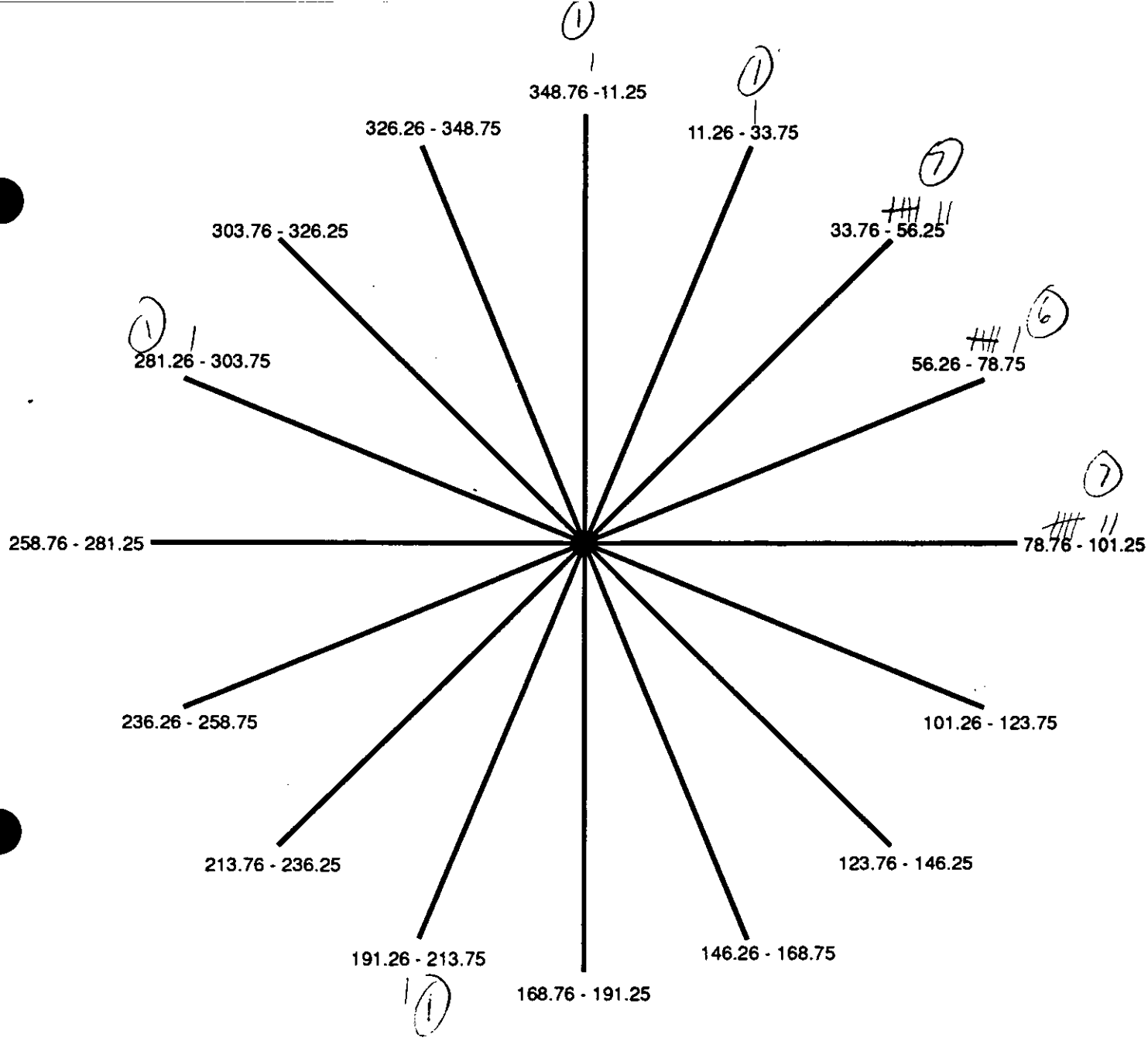
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 9-11-92

CONCENTRATION: 21.2 ug/M^3

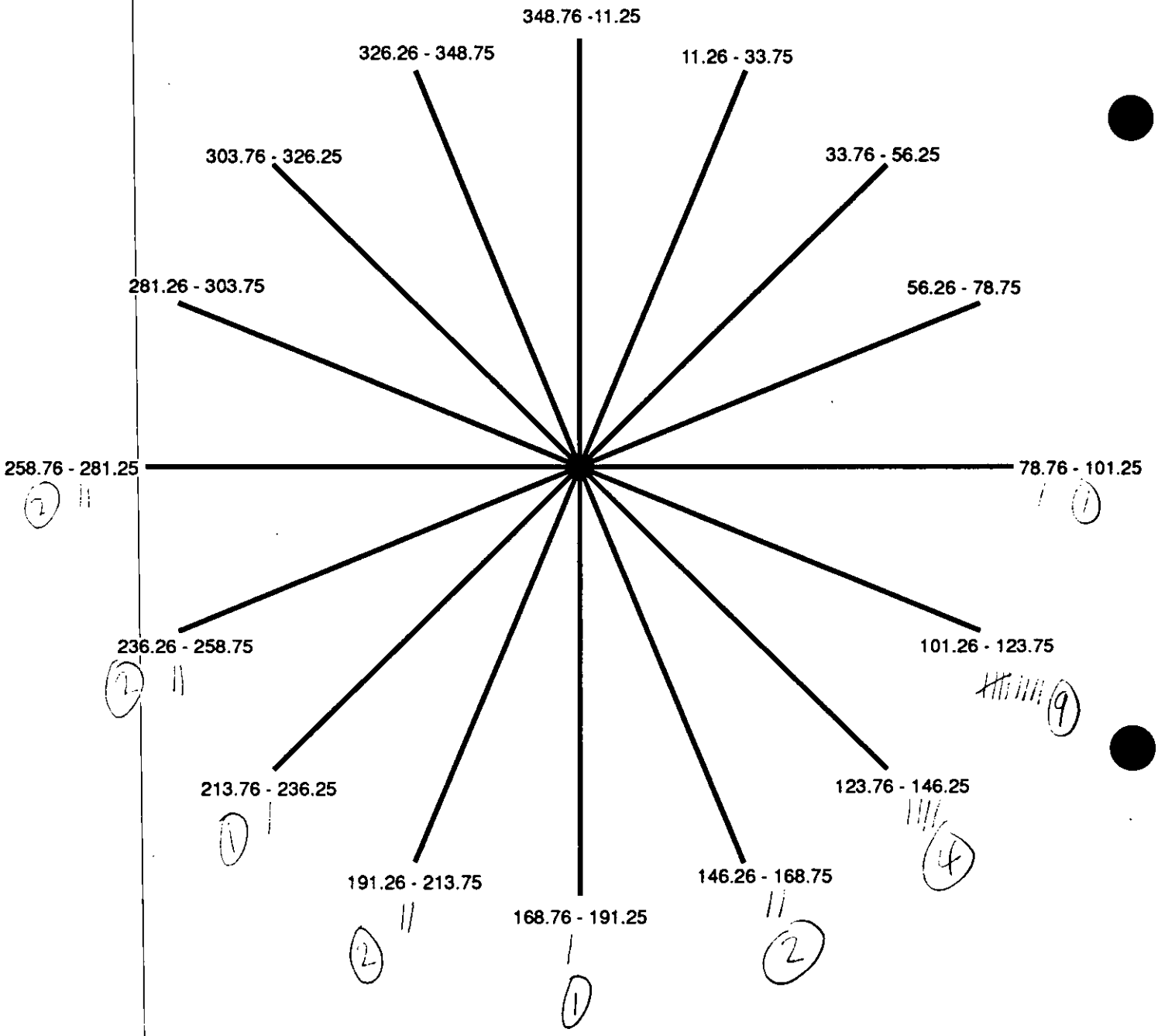
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 9-15-92

CONCENTRATION: 150 ug/M^3

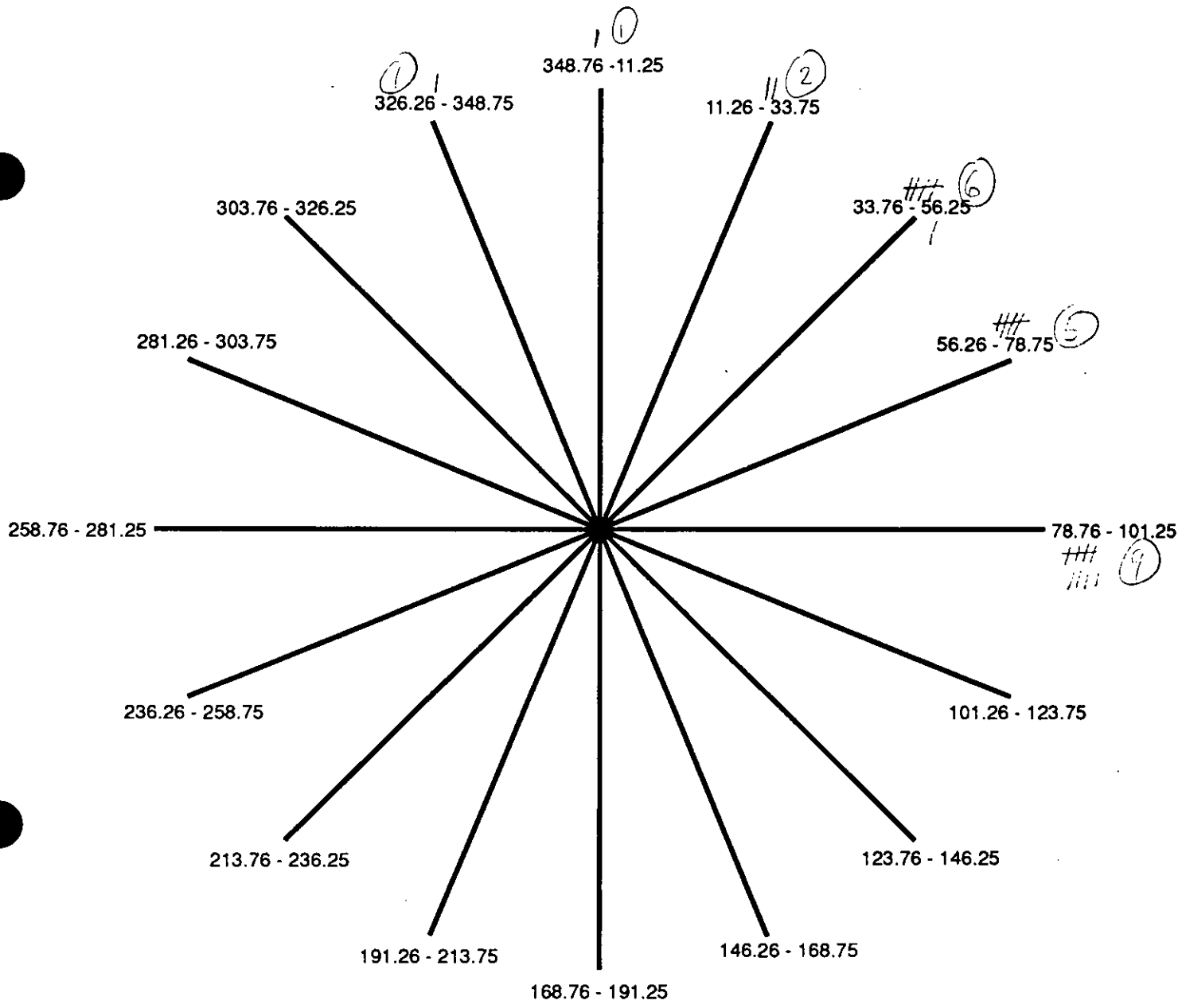
SUMMARY OF WIND DIRECTION OCCURRENCE DURING PM_{10} SAMPLING PERIOD FPC POLK COUNTY SITE



DATE: 9-21-92

CONCENTRATION: 9.1 ug/M^3

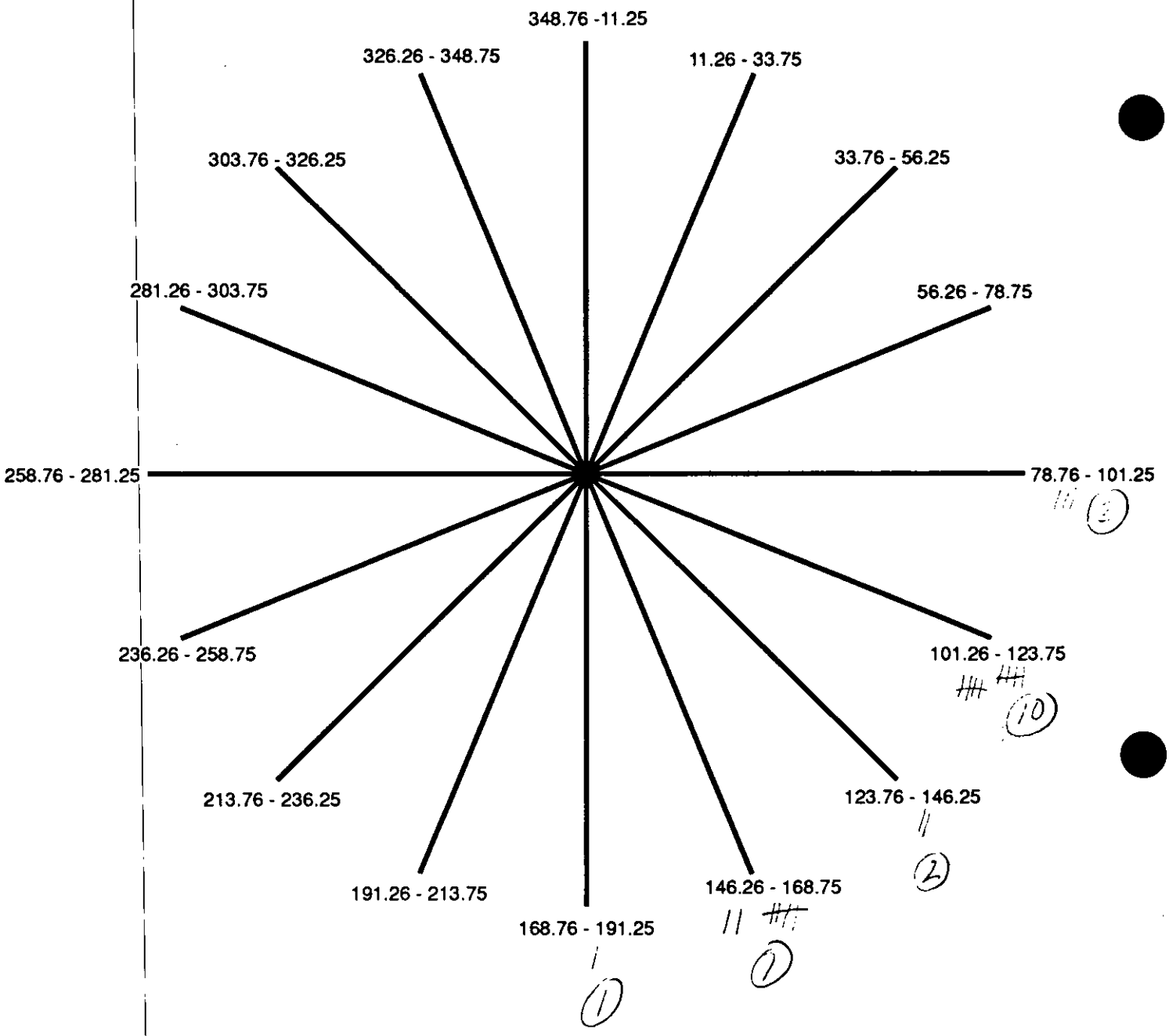
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 9-27-92

CONCENTRATION: 10.0 ug/M^3

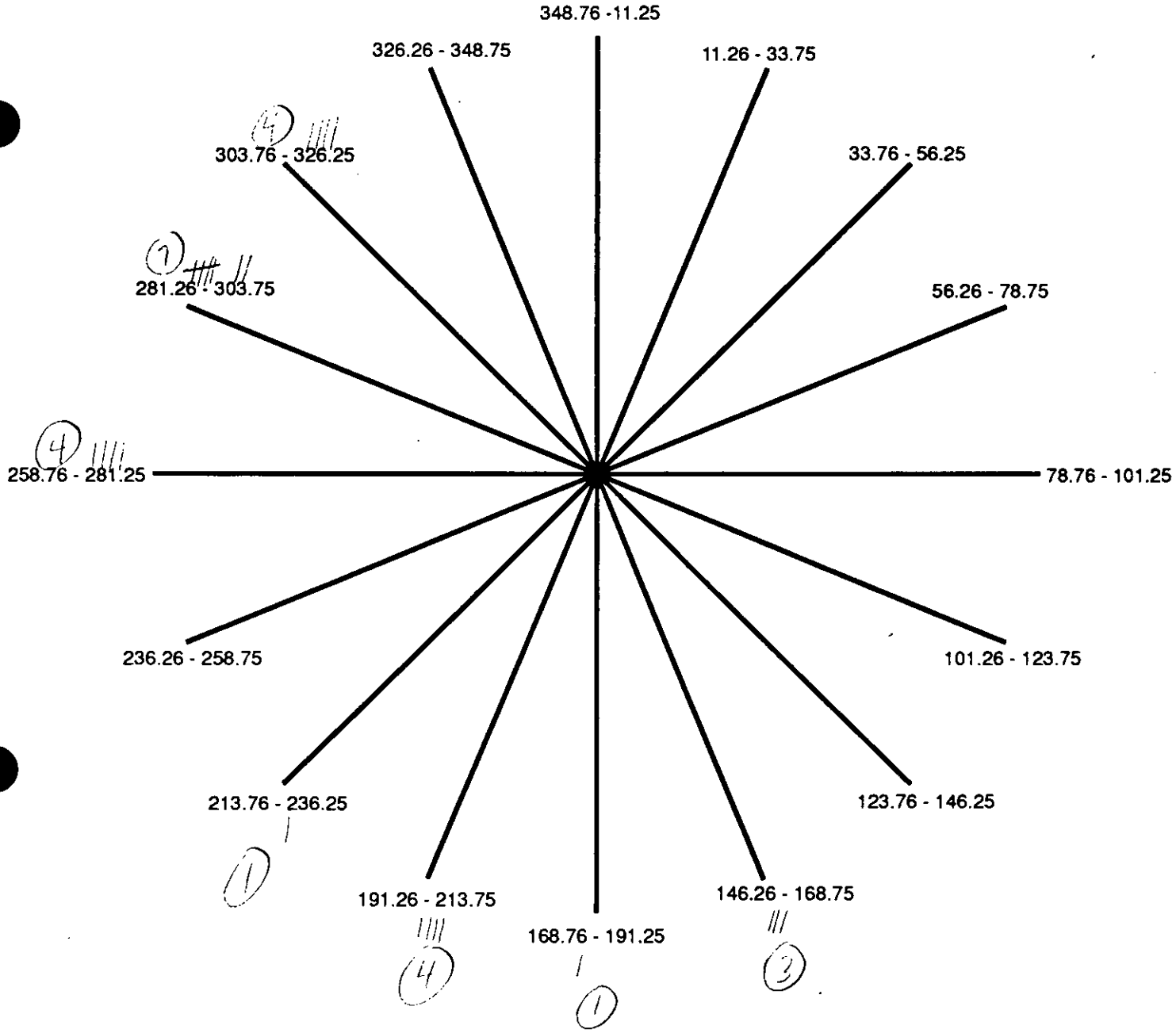
SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 6-3-92

CONCENTRATION: 150.4 ug/M^3

SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE



DATE: 10-9-92

CONCENTRATION: 9.2 ug/M^3

SUMMARY OF WIND DIRECTION OCCURRENCE
DURING PM_{10} SAMPLING PERIOD
FPC POLK COUNTY SITE

10.5.6.6 Summary of Air Quality Monitoring Data (10/15/91 -10/14/92)

SUMMARY OF POLK COUNTY SITE
ON-SITE AIR QUALITY MONITORING DATA

Pollutant	Averaging Period*	Highest Monitored Concentration ($\mu g/m^3$)	Second Highest Monitored Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	FAAQS ($\mu g/m^3$)
Sulfur Dioxide (SO_2)	3 hr	169	133	1,300	1,300
	24 hr	42	42	365	260
	Annual	5	--	80	60
Ozone (O_3)	1 hr	186	186	235	235
Particulate Matter (PM_{10})	24 hr	70	44	150	150
	Annual	20	--	50	50

*Period of Record: October 15, 1991 through October 14, 1992

Source: Ebasco Environmental, 1992

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

December 31, 1992

Ms. Kathleen L. Small
Environmental Project Manager
Florida Power Corporation
3201 Thirty-fourth Street South
St. Petersburg, Florida 33733

Dear Ms. Small:

Re: PSD-FL-195

Our review of your November 30, 1992, input and modeling data indicates your application is complete.

Previous communication suggested you would like to coordinate the PSD and Site Certification permit issuance timing. If so, a waiver of the 90-day clock is required by 10 work days before the 90th day. If you have any questions, please write me or call Mark Halverstadt at (904) 488-1344.

Sincerely,

John C. Brown, Jr.

John C. Brown, Jr., P.E.
Administrator
Air Permitting and Standards

JCB/MH/kbw

PS Form 3811, July 1983 447-845

DOMESTIC RETURN RECEIPT

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1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Kathleen Snell
Fla. Power Corp.
320 34th Street S.
St. Petersburg Fl 33733

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P062921942

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X

6. Signature – Agent
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7. Date of Delivery
JAN 05 1993

8. Addressee's Address *(ONLY if requested and fee paid)*

P 062 921 942

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Kathleen Snell
Street and No.
Fla Power Corp
P.O. State and ZIP Code
St. Pete, Fl

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Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$

Postmark or Date 1-4-93
PSP-Fl-195

PS Form 3800, June 1991

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

November 13, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Kathleen L. Small
Environmental Project Manager
Florida Power Corporation
P. O. Box 14042
St. Petersburg, FL 33733

Dear Ms. Small:

Re: AC53-217434 (PSD-FL-195)

Please provide the modeling data necessary to determine impacts for the 940 MW PSD application in order for the Department to continue its review.

If you have any questions, please contact Mark Halverstadt at (904) 488-1344.

Sincerely,

John C. Brown, Jr., P.E.
Administrator
Air Permitting and Standards

JCB/MH/plm

cc: Scott Osbourn, FPC
Darrel Graziani, Ebasco Env.

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Ms. Kathleen L. Small
Environmental Project Manager
Florida Power Corporation
P. O. Box 14042
St. Petersburg, FL 33733

4a. Article Number
P 062 922 009

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
NOV 16 1992

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811**, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

P 062 922 009

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Sent to: Ms. Kathleen L. Small, FPC	
Street and No: P. O. Box 14042	
P.O., State and ZIP Code: St. Petersburg, FL 33733	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 11-13-92 Permit: AC 53-217434 PSD-FL-195	

PS Form **3800**, June 1991

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

FAX TRANSMITTAL SHEET

NAME(S): Darrel Graziani

DEPARTMENT/COMPANY: Chasco Env.

DATE: 9/2/92

PHONE: FAX 407/225-9463

TOTAL NUMBER OF PAGES, INCLUDING COVER PAGE: 5

****

FROM: Syed Arif

DIVISION OF AIR RESOURCES MANAGEMENT

BUREAU: Air Regulation

OFFICE PHONE: 904/488-1344 FAX PHONE: (904)922-6979

SENDER: Patty Adams

COMMENTS: Original & copies mailed today - 9/2/92

HAVE A NICE DAY!

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

August 31, 1992

Ms. Kathleen L. Small
Environmental Project Manager
Florida Power Corporation
3201 Thirty-fourth Street South
P. O. Box 14042
St. Petersburg, Florida 33733

Dear Ms. Small:

Re: Completeness Review for Application to Construct 940 MW of Combined Cycle Units and an Auxiliary Boiler

AC 53-217434 and PSD-FL-195

The Department has reviewed the above referenced application package received on August 4, 1992. Based on our initial review of your proposal, we have determined that additional information is needed in order to process this application. Please complete the application by providing the information requested below:

1. The emission calculations are not adequately shown in Attachment CCU-1. All calculations affecting emissions should be shown in their entirety. This includes showing all the equations used, assumptions made and any supporting documents used for emission calculations.

2. The application must indicate which turbine will be used for the project. Based on the information presented, the application will be processed on the assumption that the GE turbine will be selected. If another turbine is installed, the application would have to be revised to include all required data for the turbine selected.

3. Please provide the basis for the emission factors used for Benzene and Formaldehyde emission calculations in Attachment CCU-1, and also include any supporting documents (i.e., table, actual vendor testing data, AP-42, etc.) used in the calculations.

4. The emission information provided for the PG-7221 FA combustion turbine at different load conditions and ambient temperatures in Attachment CCU-1 was based on GE recommended measurement methods. Please identify any differences between the different

GE test methods employed and the EPA test methods. Also provide stack test information and data for each pollutant tested, and fuel analysis data for the fuel burned during the test.

5. Please submit a detailed process flow diagram for the combined cycle units and the auxiliary boiler showing the volumetric air flow rates for each stream when burning natural gas and fuel oil. Also provide a plot plan for both alternatives giving a detailed overview of all equipment and stacks associated with the project, if available. Figure 2-2 submitted with the application is not sufficient.

6. The application states that the liquid and solid wastes generated by the combined cycle units and the auxiliary boiler will be properly disposed of at the site. Please give details of the methods of disposal and the contents of the waste material.

7. The project has not been narrowed down to the configuration of combined cycle units that will be employed to generate approximately 940 MW. The Department must know which configuration of the combined cycle units will be used for the project so that a complete BACT determination can be made. Also, provide emissions based on the alternate configuration of two 470 MW combined cycle units.

8. Please submit the manufacturer's design specifications for the proposed diesel generator. What will be the maximum operating hours per year for the diesel generator?

9. Please provide the calculations and supporting document for the emissions listed in Table 2-5, page 2-8 for Beryllium, Lead, Mercury and Inorganic Arsenic.

10. What is the efficiency of the combustion turbine? Calculate Y (refer to NSPS 40 CFR 60, Subpart GG) in kilojoules per watt hour, showing all the calculations.

11. Submit manufacturer's name, model number, generator name plate rating (gross MW), maximum steam production rate for the Heat Recovery Steam Generator (HRSG).

12. What is the maximum and nominal power (MW) output of the steam turbine generator? What is the steam input to this turbine?

13. Please submit the manufacturer's design specification for the proposed auxiliary boiler. Based on the information submitted, the application will be processed on the assumption that the

Nebraska boiler will be selected. If another boiler is installed, the application would have to be revised to include all required data for the boiler selected.

14. What is the estimated annual throughput and the type of air pollution control for the fuel oil storage tanks? What are the estimated emissions?

15. The incremental removal cost of $6,400 per ton of CO removed seems excessive. Please provide the basis and the supporting documents of arriving at this figure. The application states that combustion control will limit CO emissions to a maximum of 25 ppmvd. What will be the actual CO emissions? Also, provide the incremental removal cost to limit CO emissions to 10 ppm.

16. Please submit a detailed listing of all the continuous emission monitoring systems (CEMs) required for this project. This should include the type of the CEM (in-situ or extractive), the make and model number, the pollutant it will monitor, and any associated data acquisition system.

17. What kind of control and monitoring equipment do you propose to use for continuously recording power generation (MWS), fuel injection rate (MMCF/hr or Gal/hr) and the water injection rate (Gal/hr)?

18. Please provide the names and addresses of all the manufacturers and suppliers that were contacted for budgetary quotations and engineering estimates in developing capital and annualized cost estimates for this project and a summary of all the equipment, raw material and the fuel costs, and also, associated economic parameters (i.e., fixed charges on capital %, AFUDC % etc.).

19. Does the applicant propose to do combination fuel (natural gas and fuel oil) firing for the combined cycle units? If so, provide details on how this will be accomplished.

20. Please propose a maximum value for fuel bound nitrogen for both natural gas and fuel oil. Also, calculate the maximum NOx emissions based upon the proposed maximum value for fuel bound nitrogen for both natural gas and fuel oil.

21. While the emission inventory used in the modeling included all sources that were originally agreed upon, additional modeling must be performed, taking into account the TECO Polk, Auburndale Cogeneration, and Ridge Cogeneration facilities. These are new facilities whose stack and emissions data were not known at the time FPC did its air quality analysis. This

modeling will be performed by the Department unless you would prefer to do the remodeling yourself. A response as to who is going to perform this modeling is required as a part of FPC's reply to DER's incompleteness letter.

The processing of your application will continue upon receipt of the above requested information. If there are any questions, please call Syed Arif at (904)488-1344, or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF:cjh

cc: Darrel J. Graziani, P.E., Ebasco
Bill Thomas, SWD
Buck Oven, FDER
Syed Arif, FDER
Max Linn, FDER

SENDER: Complete items 1, 2, 3 and 4.

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3. Article Addressed to:
Kathleen L. Small Env. Proj. Mgr.
FL Power Corp
3201 34th St S
PO Box 14042
St. Petersburg, FL 33733

4. Type of Service:
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☒ Certified ☐ COD
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Article Number
P062 921 882

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X

6. Signature – Agent
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7. Date of Delivery

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PS Form 3811, July 1983 447-845 DOMESTIC RETURN RECEIPT

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Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9-2-92	

AC 53-217434
ASD-FI-145

PS Form 3800, June 1991

Florida Power
CORPORATION

October 13, 1992

Mr. Claire H. Fancy, P.E.
Florida Department of Environmental
Regulation
Chief, Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

Re: Polk County Site
Completeness Response
AC 53-217434 and PSD-FL-195

Enclosed are four copies of Florida Power Corporation's (FPC) response to the completeness review dated August 31, 1992 on the subject application. FPC would be glad to discuss any of the enclosed information in greater detail with your staff if so desired.

Should there be any questions on the project in general or the enclosed material, please contact me at (813) 866-5529 or Mr. Scott Osbourn at (813) 866-5158.

Very truly yours,

Kathy Small

Kathleen L. Small
Environmental Project Manager

Enclosure

cc: H. S. Oven (FDER) - w/o encs.

pag\KLS\1992\Fancy2.Let

Oct 15, 1992 Response to FPC POLK CTY

Request 1. The emission calculations are not adequately shown in Attachment CCU-1. All calculations affecting emissions should be shown in their entirety. This includes showing all the equations used, assumptions made, and any supporting documents used for emission calculations.

Response 1. The emission concentrations (ppm) shown in Attachment CCU-1 on the GE Performance Data Sheets are based on results of GE developmental work to characterize emissions from these combustors. Simply converting ppm concentrations to pound per hour emissions involves a standard procedure utilizing flue gas analyses and conversion factors. Three sets of emission calculations which detail the conversion from ppm to pound per hour for the base load case at 40°F, 72°F, and 95°F for natural gas and distillate oil operation are provided by Black and Veatch as an attachment to this response.

	HANDWRITTEN CALCULATION RECORD	PAGE 1 OF 31

PROJECT NAME Florida Power Corporation PROJ. NO. 18875.030

ISSUED TO Florida DER FILE NO. 32.0402.1201

INITIATING SUPERVISOR P. P. Majerle DATE September 14, 1992

SCOPE Calculate Emission Flow Rates, ppm to lb/Hr.

☐ CONCEPTUAL ☒ FINAL

SUPERVISOR DESIGNATED PARAMETERS

DESIGN VERIFICATION REQUIREMENTS: ☐ NONE ☒ CHECK AND DESIGN REVIEW ☐ ALTERNATE CALCULATIONS

REV	PREPARED BY / DATE	CHECKED BY / DATE	DES. REV. BY / DATE	ALT. CAL. BY / DATE	SUP. DES. REV. / DATE	COMPLETED / DATE
0	R. L. Van Harlem 9/14/92	P. P. Majerle 9-14-92			C. J. Schutty 9/15/92	

CHARLES J. SCHUTTY CERTIFICATE NO. 43646 STATE OF FLORIDA REGISTERED ENGINEER

REV	LIST OF REVISED PAGES	REV	LIST OF REVISED PAGES

REV	QUALIFICATIONS OF VERIFICATION

P ME 561B

Florida Power Corporation
Polk County Project

B&V Project 18875.030
Calc 32.0402.1201
CJS 9/15/92

Case 1: 72 F, Base Load, Natural Gas

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0372$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .0928$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1249$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7363$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0089$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3266000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 12$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 25$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3559 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 20.6282 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 3.9968 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 1.6372 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 1.6719 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.29 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 115447 \cdot \frac{mol}{hr}$ $H2O_{flow} = 193014 \cdot \frac{lb}{hr}$

Case 1: 72 F, Base Load, Natural Gas

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 13 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0098$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8116$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.1377$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.041$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3924 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.7383 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 4.4056 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 1.8046 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.3409 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 3072986 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 104734 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 73 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.1377$ $\quad DRY_{molflow} = 104734 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 21584 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 126317 \cdot \frac{mol}{hr}$$

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1226 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 101861 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 18948 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 4295 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 126329 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0097$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.8063$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.034$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 1: 72 F, Base Load, Natural Gas

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3882 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.5897 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.7996 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.4962 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} := AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.2735 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 70 \cdot \frac{lb}{hr}$

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Polk County Project

B&V Project 18875.030
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Case 2: 72 F, Base Load, Distillate Oil

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0520$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .1250$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1094$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7051$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0085$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3392000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 42$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 30$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3399 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 19.7541 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 3.5008 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 2.2885 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 2.252 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.1354 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 120560 \cdot \frac{mol}{hr}$ $H2O_{flow} = 271501 \cdot \frac{lb}{hr}$

Case 2: 72 F, Base Load, Distillate Oil

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 14 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0097$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8058$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.125$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.0594$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3885 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.5761 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 4.0009 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 2.6155 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.581 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 3120499 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 105490 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 89 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.125$ $\quad DRY_{molflow} = 105490 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 44051 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 149541 \cdot \frac{mol}{hr}$$

Case 2: 72 F, Base Load, Distillate Oil

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1430 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 119411 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 22431 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 6269 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 149541 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0096$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.7985$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.0419$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 2: 72 F, Base Load, Distillate Oil

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3825 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.3712 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.8 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.845 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} := AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.3987 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 289 \cdot \frac{lb}{hr}$

Case 3: 40 F, Base Load, Natural Gas

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0378$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .0789$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1267$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7476$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0090$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3500000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 12$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 25$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3599 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 20.9448 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 4.0544 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 1.6638 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 1.4215 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.4441 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 123048 \cdot \frac{mol}{hr}$ $H2O_{flow} = 174908 \cdot \frac{lb}{hr}$

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 14 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0098$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8116$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.1376$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.041$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3908 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.7389 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 4.4017 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 1.8061 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.3374 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 3325092 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 113340 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 79 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.1376$ $\quad DRY_{molflow} = 113340 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 23591 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 136931 \cdot \frac{mol}{hr}$$

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1324 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 110415 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 20540 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 4651 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 136931 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0097$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.8064$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.034$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 3: 40 F, Base Load, Natural Gas

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3868 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.591 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.8 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.4949 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} := AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.2727 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 76 \cdot \frac{lb}{hr}$

Case 4: 40 F. Base Load. Distillate Oil

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0531$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .1181$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1093$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7109$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0087$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3652000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 42$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 30$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3479 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 19.9166 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 3.4976 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 2.3369 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 2.1277 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.2267 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 129381 \cdot \frac{mol}{hr}$ $H2O_{flow} = 275282 \cdot \frac{lb}{hr}$

Case 4: 40 F. Base Load. Distillate Oil

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 15 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0099$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8061$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.1239$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.0602$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3945 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.5837 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 3.966 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 2.6499 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.5941 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 3376718 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 114101 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 96 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.1239$ $\quad DRY_{molflow} = 114101 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 49729 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 163830 \cdot \frac{mol}{hr}$$

Case 4: 40 F. Base Load. Distillate Oil

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1583 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 130816 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 24575 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 6870 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 163843 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0097$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.7984$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.0419$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 4: 40 F. Base Load. Distillate Oil

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3864 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.3685 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.7996 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.8454 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} := AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.3999 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 317 \cdot \frac{lb}{hr}$

Case 5: 95 F, Base Load, Natural Gas

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0366$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .0970$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1250$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7326$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0088$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3099000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 12$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 25$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3519 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 20.5245 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 4 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 1.6108 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 1.7476 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.2348 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 109758 \cdot \frac{mol}{hr}$ $H2O_{flow} = 191808 \cdot \frac{lb}{hr}$

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 12 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0097$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8113$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.1384$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.0405$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3898 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.7293 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 4.4297 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 1.7838 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.3325 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 2907192 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 99112 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 69 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.1384$ $\quad DRY_{molflow} = 99112 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 19180 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 118292 \cdot \frac{mol}{hr}$$

Case 5: 95 F, Base Load, Natural Gas

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1142 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 95389 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 17744 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 4017 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 118292 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0097$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.8064$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.034$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 5: 95 F. Base Load, Natural Gas

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3862 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.5916 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.8 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.4946 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} := AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.2724 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 65 \cdot \frac{lb}{hr}$

Case 6: 95 F. Base Load. Distillate Oil

Given the following wet exhaust gas analysis in volume % and corresponding molecular weights:

$CO2_{wetfrac} := .0512$ $CO2_{molwt} := 44.010 \cdot \frac{lb}{mol}$

$H2O_{wetfrac} := .1266$ $H2O_{molwt} := 18.016 \cdot \frac{lb}{mol}$

$O2_{wetfrac} := .1103$ $O2_{molwt} := 32.000 \cdot \frac{lb}{mol}$

$N2_{wetfrac} := .7035$ $N2_{molwt} := 28.016 \cdot \frac{lb}{mol}$

$AR_{wetfrac} := .0084$ $AR_{molwt} := 39.994 \cdot \frac{lb}{mol}$

Total exhaust flow and emmission data are given as:

$WET_{flow} := 3212000 \cdot \frac{lb}{hr}$

$NOx_{ppm} := 42$ ppm dry volume at 15% O2 $NOx_{molwt} := 46.008 \cdot \frac{lb}{mol}$

$CO_{ppm} := 30$ ppm dry volume $CO_{molwt} := 28.010 \cdot \frac{lb}{mol}$

$UHC_{ppm} := 7$ ppm wet volume $UHC_{molwt} := 16.042 \cdot \frac{lb}{mol}$ as CH4

Calculate wet molecular flow rate.

$AR := AR_{wetfrac} \cdot AR_{molwt}$ $AR = 0.3359 \cdot \frac{lb}{mol}$

$N2 := N2_{wetfrac} \cdot N2_{molwt}$ $N2 = 19.7093 \cdot \frac{lb}{mol}$

$O2 := O2_{wetfrac} \cdot O2_{molwt}$ $O2 = 3.5296 \cdot \frac{lb}{mol}$

$CO2 := CO2_{wetfrac} \cdot CO2_{molwt}$ $CO2 = 2.2533 \cdot \frac{lb}{mol}$

$H2O := H2O_{wetfrac} \cdot H2O_{molwt}$ $H2O = 2.2808 \cdot \frac{lb}{mol}$

$WET_{molwt} := AR + N2 + O2 + CO2 + H2O$

$WET_{molwt} = 28.1089 \cdot \frac{lb}{mol}$

$WET_{molflow} := \frac{WET_{flow}}{WET_{molwt}}$ $H2O_{flow} := \frac{H2O}{WET_{molwt}} \cdot WET_{flow}$

$WET_{molflow} = 114270 \cdot \frac{mol}{hr}$ $H2O_{flow} = 260629 \cdot \frac{lb}{hr}$

Case 6: 95 F. Base Load. Distillate Oil

Calculate the total unburned hydrocarbon flow rate.

$$UHC_{flow} := \frac{UHC_{ppm}}{1000000} \cdot WET_{molflow} \cdot UHC_{molwt}$$

$$UHC_{flow} = 13 \cdot \frac{lb}{hr}$$

Calculate the dry exhaust gas analysis by volume.

$$AR_{dryfrac} := \frac{AR_{wetfrac}}{1 - H2O_{wetfrac}} \qquad AR_{dryfrac} = 0.0096$$

$$N2_{dryfrac} := \frac{N2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad N2_{dryfrac} = 0.8055$$

$$O2_{dryfrac} := \frac{O2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad O2_{dryfrac} = 0.1263$$

$$CO2_{dryfrac} := \frac{CO2_{wetfrac}}{1 - H2O_{wetfrac}} \qquad CO2_{dryfrac} = 0.0586$$

$$Total := AR_{dryfrac} + N2_{dryfrac} + O2_{dryfrac} + CO2_{dryfrac}$$

$$Total = 1$$

Calculate dry molecular flow rate.

$$AR := AR_{dryfrac} \cdot AR_{molwt} \qquad AR = 0.3846 \cdot \frac{lb}{mol}$$

$$N2 := N2_{dryfrac} \cdot N2_{molwt} \qquad N2 = 22.5661 \cdot \frac{lb}{mol}$$

$$O2 := O2_{dryfrac} \cdot O2_{molwt} \qquad O2 = 4.0412 \cdot \frac{lb}{mol}$$

$$CO2 := CO2_{dryfrac} \cdot CO2_{molwt} \qquad CO2 = 2.5799 \cdot \frac{lb}{mol}$$

$$DRY_{molwt} := AR + N2 + O2 + CO2$$

$$DRY_{molwt} = 29.5719 \cdot \frac{lb}{mol}$$

$$DRY_{flow} := WET_{flow} - H2O_{flow}$$

$$DRY_{flow} = 2951371 \cdot \frac{lb}{hr}$$

$$DRY_{molflow} := \frac{DRY_{flow}}{DRY_{molwt}}$$

$$DRY_{molflow} = 99803 \cdot \frac{mol}{hr}$$

Calculate the total carbon monoxide flow rate.

$$CO_{flow} := \frac{CO_{ppm}}{1000000} \cdot DRY_{molflow} \cdot CO_{molwt}$$

$$CO_{flow} = 84 \cdot \frac{lb}{hr}$$

Calculate the additional air flow required to achieve 15% O2 by volume on a dry basis.

Assume: $O2_{airfrac} := 0.2098$

$N2_{airfrac} := 0.7810$

$AR_{airfrac} := 0.0092$

$O2_{dryfrac} = 0.1263$ $\quad DRY_{molflow} = 99803 \cdot \frac{mol}{hr}$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot MIX_{molflow}$$

$$MIX_{O2molflow} := 0.15 \cdot DRY_{molflow} + 0.15 \cdot AIR_{molflow}$$

$$MIX_{O2molflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$AIR_{molflow} := \left(\frac{0.15 \cdot DRY_{molflow} - O2_{dryfrac} \cdot DRY_{molflow}}{O2_{airfrac} - 0.15} \right)$$

$$AIR_{molflow} = 39574 \cdot \frac{mol}{hr}$$

$$MIX_{molflow} := DRY_{molflow} + AIR_{molflow}$$

$$MIX_{molflow} = 139377 \cdot \frac{mol}{hr}$$

Calculate dry exhaust analysis at 15% O2 by volume.

$$AR_{mixflow} := AR_{dryfrac} \cdot DRY_{molflow} + AR_{airfrac} \cdot AIR_{molflow}$$

$$AR_{mixflow} = 1324 \cdot \frac{mol}{hr}$$

$$N2_{mixflow} := N2_{dryfrac} \cdot DRY_{molflow} + N2_{airfrac} \cdot AIR_{molflow}$$

$$N2_{mixflow} = 111296 \cdot \frac{mol}{hr}$$

$$O2_{mixflow} := O2_{dryfrac} \cdot DRY_{molflow} + O2_{airfrac} \cdot AIR_{molflow}$$

$$O2_{mixflow} = 20907 \cdot \frac{mol}{hr}$$

$$CO2_{mixflow} := CO2_{dryfrac} \cdot DRY_{molflow}$$

$$CO2_{mixflow} = 5851 \cdot \frac{mol}{hr}$$

$$TOTAL_{mixflow} := AR_{mixflow} + N2_{mixflow} + O2_{mixflow} + CO2_{mixflow}$$

$$TOTAL_{mixflow} = 139377 \cdot \frac{mol}{hr}$$

Check analysis of dry exhaust at 15% O2 by volume.

$$AR_{mixfrac} := \frac{AR_{mixflow}}{TOTAL_{mixflow}} \qquad AR_{mixfrac} = 0.0095$$

$$N2_{mixfrac} := \frac{N2_{mixflow}}{TOTAL_{mixflow}} \qquad N2_{mixfrac} = 0.7985$$

$$O2_{mixfrac} := \frac{O2_{mixflow}}{TOTAL_{mixflow}} \qquad O2_{mixfrac} = 0.15$$

$$CO2_{mixfrac} := \frac{CO2_{mixflow}}{TOTAL_{mixflow}} \qquad CO2_{mixfrac} = 0.042$$

$$Total := AR_{mixfrac} + N2_{mixfrac} + O2_{mixfrac} + CO2_{mixfrac}$$

$$Total = 1$$

Case 6: 95 F, Base Load, Distillate Oil

Calculate dry molecular weight at 15% O2.

$AR := AR_{mixfrac} \cdot AR_{molwt}$ $\quad AR = 0.3799 \cdot \frac{lb}{mol}$

$N2 := N2_{mixfrac} \cdot N2_{molwt}$ $\quad N2 = 22.3715 \cdot \frac{lb}{mol}$

$O2 := O2_{mixfrac} \cdot O2_{molwt}$ $\quad O2 = 4.8 \cdot \frac{lb}{mol}$

$CO2 := CO2_{mixfrac} \cdot CO2_{molwt}$ $\quad CO2 = 1.8474 \cdot \frac{lb}{mol}$

$DRY_{1502molwt} = AR + N2 + O2 + CO2$

$DRY_{1502molwt} = 29.3988 \cdot \frac{lb}{mol}$

Calculate the total nitrous oxides flow rate.

$NOx_{flow} := \frac{NOx_{ppm}}{1000000} \cdot TOTAL_{mixflow} \cdot NOx_{molwt}$

$NOx_{flow} = 269 \cdot \frac{lb}{hr}$

Request 2. The application must indicate which turbine will be used for the project. Based on the information presented, the application will be processed on the assumption that the GE turbine will be selected. If another turbine is installed, the application would have to be revised to include all required data for the turbine selected.

Response 2. Florida Power Corporation (FPC) is not in a position to finally select a specific combustion turbine for the project at this time. The need for extensive site preparation activities at the Polk County Site dictates the long lead time between the filing of the application and plant operation. The planned date for first unit operation (1998) allows the decision on combustion turbine selection to be made as late as December 1994. FPC is basing the design of the first 940 MW on the GE Frame 7FA with a dry low NO_x III combustor, because that machine is representative of a group of combustion turbines of similar size which will be available from several vendors at the time the selection is made. FPC recognizes that the application would need to be revised if a different turbine is selected which has higher pollutant emission rates than the GE Frame 7FA. FPC asks that the application be reviewed based on the information submitted.

Request 3. Please provide the basis for the emission factors used for benzene and formaldehyde emission calculations in Attachment CCU-1, and also include any supporting documents (*i.e.*, table, actual vendor testing data, AP-42, etc.) used in the calculations.

Response 3. As reported by General Electric, maximum unburned hydrocarbon emissions from each combustion turbine are expected to be 14 and 15 pounds per hour when fired on natural gas and fuel oil, respectively. Based on "good engineering judgement" it is expected that approximately 80 percent of these emissions may be volatile organic compounds. Information on the speciation of combustion turbine volatile organic compounds emissions is not available at this time. Thus, specific vendor data on emissions of benzene and formaldehyde are not available.

A review of the currently available published emission factors for toxic air contaminants revealed benzene and formaldehyde as potential air contaminants associated with the combustion of natural gas and fuel oil in boilers. For natural gas, benzene and formaldehyde emissions were estimated based on emission factors of 6.8×10^{-5} lb/mmBtu (ref. no. 2) and 0.095 ng/J (ref. no. 1), respectively. The formaldehyde natural gas emission factor is one of three which was available for domestic, commercial/institutional and industrial boilers. The choice of the commercial/institutional emission factor was based on the size of the combustion turbine and its magnitude. For fuel oil, benzene and formaldehyde emissions are estimated based on emission factors of 13.4 lb/Ton (ref. no. 1) and 4.05×10^{-4} lb/mmBtu (ref. no. 1). Estimated short-term and annual emission calculations are attached. These calculations amend those values previously submitted on pages CCU15, CCU18, 4-29, 4-30 and 7-15 of the PSD permit application.

Copies of the revised pages, calculations and references are attached.

CALCULATION COVER SHEET

CLIENT: Florida Power Corporation OFS #: FPC 2563.544

PROJECT: Polk County Site DEPT #: 0751

SUBJECT: Benzene and Formaldehyde emission estimates / Toxics Analysis

CALCULATION NO: 920916DJG01 NUMBER OF SHEETS: 11

David J Grazi 9.18.92

CONTAINS ASSUMPTIONS WHICH REQUIRE CONFIRMATION.

☒ YES ☐ NO

ASSUMPTION CONFIRMED ON: _____ BY _____

REV #	SH NOS.	CALCULATION BY NAME	DATE	CHECKED BY NAME	DATE	REVIEWED OR APPROVED BY OPTIONAL	NAME	DATE
	1	D.Graziani	9/16/92	K MORETTI	9/18/92			

PRELIMINARY ☒ FINAL ☐ SUPERCEDES CALC # ☐ _____

920916D3601

EBASCO SERVICES INCORPORATED

BY D. Graziani DATE 9/16/92 SHEET 1 OF 2

CHKD. BY _____ DATE _____ OFS NO. FPC 2563.544 DEPT. NO. 0751

CLIENT Florida Power Corporation

PROJECT Polk County Site

SUBJECT Benzene + Formaldehyde emission estimates / Toxics Analysis

Assumptions: Emission factors for combustion turbines for benzene and formaldehyde emissions are not available. However reference No.1 does list emission factors for natural gas and fuel oil combustion. Although these factors may not correctly estimate emission levels, simple identification that the pollutants maybe emitted is sufficient. For PSD purposes, "any" amount of benzene emissions are considered significant. For Toxics anylsis purposes the assumption that all unburned hydrocarbons are either benzene or formaldehyde is extremely conservative.

Emission Factors

Benzene (Natural Gas)

4% of unburned hydrocarbons — Reference No. 1, pg 3-21

6.8×10^{-5} lb/mmBtu of heat input — Reference No. 2

Formaldehyde (Natural Gas)

$$(0.43\ ng/J)\left(\frac{1E\text{-}9\ g}{ng}\right)\left(\frac{lb}{454\ g}\right)\left(\frac{1\ J}{0.0009471\ Btu}\right)\left(\frac{1\times10^{6}\ Btu}{mmBtu}\right) = 1.00E\text{-}3\ lb/mmBtu$$ Ref. No.1, pg 3-116

$$(0.095\ ng/J)\left(\frac{1E\text{-}9\ g}{ng}\right)\left(\frac{lb}{454\ g}\right)\left(\frac{1\ J}{0.0009471\ Btu}\right)\left(\frac{1\times10^{6}\ Btu}{mmBtu}\right) = 2.21E\text{-}4\ lb/mmBtu$$ ref. No.1, pg 3-116

$$(0.038\ ng/J)\left(\frac{1E\text{-}9\ g}{ng}\right)\left(\frac{lb}{454\ g}\right)\left(\frac{1\ J}{0.0009471\ Btu}\right)\left(\frac{1\times10^{6}\ Btu}{mmBtu}\right) = 8.84E\text{-}5\ lb/mmBtu$$ ref. No.1, pg 3-116

Benzene (fuel oil)

13.4 lb/Ton of total hydrocarbons emitted — ref. No.1, pg 3-30

Formaldehyde (fuel oil)

$$(4051b/10^{12}\ Btu)\left(\frac{1E6\ Btu}{mmBtu}\right) = 4.05E\text{-}4\ lb/mmBtu$$ ref No.1, pg 3-116

920916DJG01

EBASCO SERVICES INCORPORATED

BY D. Graziani DATE 9/16/92 SHEET 2 OF 2

CHKD. BY _____ DATE _____ OFS NO. FPC 2563.544 DEPT. NO. 0751

CLIENT Florida Power Corporation

PROJECT Polk County Site

SUBJECT Benzene and Formaldehyde emission estimates / Toxics Analysis

Emission Estimates : For estimation purposes the following emission factors were selected based on best engineering judgement:

Natural Gas: Benzene - 6.8×10^{-5} lb/mm Btu
Formaldehyde - 2.21×10^{-4} lb/mm Btu

Fuel Oil : Benzene - 13.4 lb/Ton of UHC
Formaldehyde - 4.05×10^{-4} lb/mm Btu

Maximum Heat input rates : Natural Gas - 1572.5 mm Btu/hr per turbine
Fuel Oil - 1799.8 mm Btu/hr per turbine

Maximum UHC emission rates : Natural Gas - 14 lb/hr UHC per turbine
Fuel Oil - 15 lb/hr UHC per turbine

Natural Gas Emissions: Heat Input Rates - Ref No. 3

Benzene : $(6.8 \times 10^{-5} \frac{lb}{mm Btu})(1572.5 \text{ mm Btu/hr})(4 \text{ turbines}) = .43$ lb/hr

Formaldehyde : $(2.21 \times 10^{-4} \frac{lb}{mm Btu})(1572.5 \frac{mm Btu}{hr})(4 \text{ turbines}) = 1.39$ lb/hr

Fuel Oil Emissions: Heat Input Rates - Ref No. 4

Benzene : $(13.4 \text{ lb/Ton UHC})(15 \text{ lb-UHC/hr})(\frac{Ton}{2000 lb})(4 \text{ turbines}) = 0.402$ lb/hr

Formaldehyde : $(4.05 \times 10^{-4} \text{ lb/mm Btu})(1799.8 \frac{mm Btu}{hr})(4 \text{ turbines}) = 2.92$ lb/hr

Annual Emissions

Benzene (100% Natural Gas): $(0.43 \text{ lb/hr})(8760 \text{ hr/yr})(\text{Ton}/2000 \text{ lb}) = 1.88$ TPY

Formaldehyde (Gas/Oil): $[(1.39 \text{ lb/hr})(8260 \text{ hr/yr}) + (2.92 \text{ lb/hr})(500 \text{ hr/yr})]\frac{Ton}{2000 lb} =$ 6.47 TPY

9209603601

Ref No. 1

United States
Environmental Protection
Agency

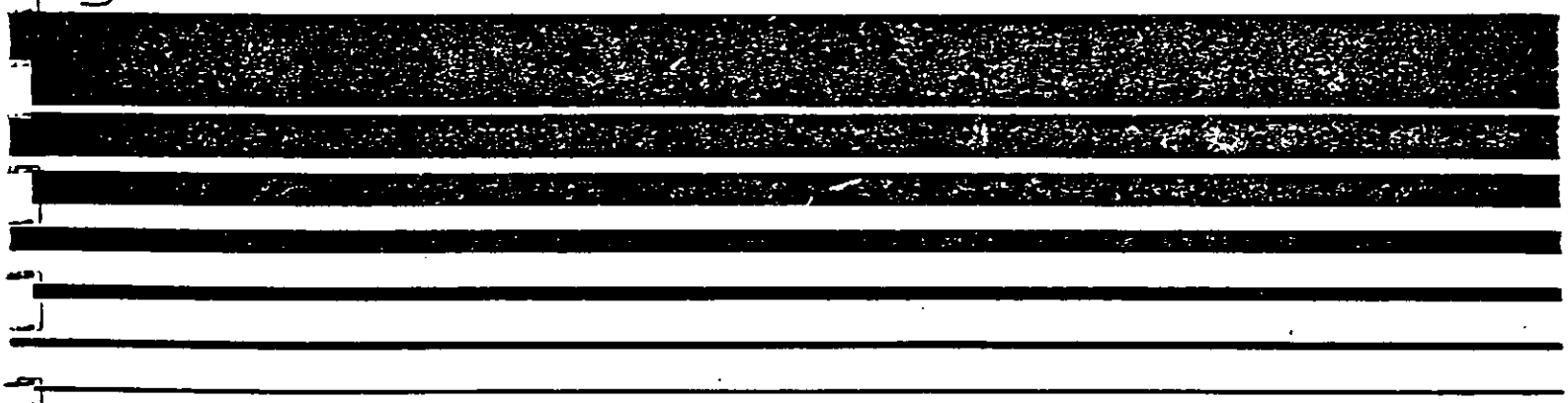
Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450 2-88-006a
October 1988

Air

EPA

TOXIC AIR POLLUTANT EMISSION FACTORS— A COMPILATION FOR SELECTED AIR TOXIC COMPOUNDS AND SOURCES



POLLUTANT	CAS NUMBER	SIC CODE	INDUSTRIAL PROCESS	EMISSION SOURCE	SCC	EMISSION FACTOR	NOTES	REFERENCE
Benzene	71432		Mobile internal combustion sources	Light duty gasoline vehicles, noncatalyst or oxidation catalyst, exhaust		3.95% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Light duty gasoline truck exhaust emissions		3.24% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Light duty gasoline truck exhaust emissions		1.1% benzene of evaporative HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Light duty diesel vehicle exhaust emissions		2.4% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Light duty diesel truck exhaust emissions		2.4% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Heavy duty gasoline vehicle exhaust emissions		3.48% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Mobile internal combustion sources	Heavy duty diesel vehicle exhaust emissions		1.10% benzene of exhaust HCs	Engineering judgement	132
Benzene	71432		Wood combustion, residential	Small airtight woodstoves, birch wood		67.8 mg/kg dry fuel burned	Normal high-temperature burning conditions, based on emission tests	57
Benzene	71432		Wood combustion, residential	Small airtight woodstoves, birch wood		1286 mg/kg dry fuel burned	Starved air conditions, based on emission tests	57
Benzene	71432		Wood combustion, residential	Small airtight woodstoves, spruce wood		269 mg/kg dry fuel burned	Normal high-temperature burning conditions, based on emission tests	57
Benzene	71432		Waste oil combustion	Waste oil-fired boilers (<150 million Btu/h) or space heaters	1	0.005 g/liter oil burned	Uncontrolled, based on emissions data and engineering judgement, assumes 97% DRE	55
Benzene	71432		Natural gas combustion	Boilers, exhaust system	102006	1.18% by vol (or 4% by wt) benzene	South Coast study, California, engineering judgement	132
Benzene	71432	2491	Wood preserving	Thermal (pan) evaporation of pentachlorophenol wastewater		<5 mg/sm3 gas vented	Average value	6
Benzene	71432	2491	Wood preserving	Incineration of waste	307005	Not detectable	Controlled with baghouse	6
Benzene	71432	2865	Cumene production	Benzene azeotrope drying column	30115602	0.02 g/kg cumene produced	Uncontrolled, based on hypothetical plant producing 227 Gg cumene/yr	132

9209683601
Ref No 1

POLLUTANT	CAS NUMBER	SIC CODE	INDUSTRIAL PROCESS	EMISSION SOURCE	SCC	EMISSION FACTOR	NOTES	REFERENCE
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge cleaned, volatile previous cargo	4060023	1.1 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge gas-freed, volatile previous cargo	4060023	0.5 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0:006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge any condition, nonvolatile previous cargo	4060023	0.5 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge typical situation, any cargo	4060023	1.3 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge ballasted, volatile previous cargo	40600235	1.2 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Ship/ocean barge uncleaned, volatile previous cargo	40600237	1.9 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Barge, uncleaned, volatile previous cargo	40600238	2.8 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Tanker ballasting	40600241	0.6 mg/liter gas transferred	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4491	Gasoline loading in marine vessels	Transit	40600242	1.9 mg (per wk)/liter gas transfer	Uncontrolled, assuming a benzene/VOC ratio of 0.006, no basis girth	132
Benzene	71432	4581	Jet engine exhaust	Engine	2	13.4 lb/ton total hydrocarbons emitted	Benzene assumed to be 0.067% of HC emissions	92
Benzene	71432	4925	Coke oven gas boiler	Emission stream	10200802	0.42% by vol (1.90% by wt)	South Coast study, California, engineering judgement	132
Benzene	71432	4925	Production of ethylene from naphtha/gas oil	Fugitive emissions	301197	45.9 g/Mg ethylene produced	Uncontrolled	132
Benzene	71432	4925	Production of ethylene from naphtha/gas oil	Fugitive emissions	301197	8.8 g/Mg ethylene produced	*Detection/correction of leaks*	132

POLLUTANT	CAS NUMBER	SIC CODE	INDUSTRIAL PROCESS	EMISSION SOURCE	SCC	EMISSION FACTOR	NOTES	REFERENCE
Fluorine	7782414	2874	Phosphoric acid production - wet process	Reactor	30101601	56.4 lb/ton	Uncontrolled, based on mass balance	97
Fluorine	7782414	2874	Phosphoric acid production - wet process	Gypsum settling ponds	30101602	1.12 lb/ton acid	0.7 acres of pond needed to produce 1 ton acid	97
Fluorine	7782414	2874	Phosphoric acid production - wet process	Condenser	30101603	61.2 lb/ton acid	Uncontrolled, based on mass balance	97
Formaldehyde	50000		Wood combustion, residential	Woodstoves		0.48 lb/ton of wood burned	Uncontrolled, based on source test	58
Formaldehyde	50000		Wood combustion, residential	Fireplaces		3.0 lb/ton of wood burned	Uncontrolled, based on source test	58
Formaldehyde	50000		Wood combustion, residential	Small airtight woodstoves, birch wood		57.8 mg/kg dry fuel burned	Normal high-temperature burning conditions, based on emission tests	57
Formaldehyde	50000		Wood combustion, residential	Small airtight woodstoves, birch wood		1722 mg/kg dry fuel burned	Starved air conditions, based on emission tests	57
Formaldehyde	50000		Wood combustion, residential	Small airtight woodstoves, spruce wood		41.4 mg/kg dry fuel burned	Normal high-temperature burning conditions, based on emission tests	57
Formaldehyde	50000		Wood combustion, residential	Small airtight woodstoves, spruce wood		255 mg/kg dry fuel burned	Normal high-temperature burning conditions, based on emission tests	57
Formaldehyde	50000		Asphalt plants	Entire process		0.00015 lb/ton asphalt produced	Control uncertain	94
Formaldehyde	50000		Oil combustion	Oil-fired boiler or furnace, util/commerc/industr/residential	1	405 lb/10E12 Btu	Uncontrolled, based on emissions testing	36
Formaldehyde	50000		Coal combustion	Coal-fired boilers or furnaces, util/commerc/industr/residential	1	170.5 lb/10E12 Btu	Uncontrolled, based on measured emis. factors, insuf. data to characterize emis. by boiler type	36
Formaldehyde	50000		Natural gas combustion	Domestic	1	0.43 ng/J heat input	Control status unspecified, based on source tests	106
Formaldehyde	50000		Natural gas combustion	Industrial	102006	0.038 ng/J heat input	Control status unspecified, based on source tests	106
Formaldehyde	50000		Wood combustion	Industrial	102009	0.48 lb/ton	Uncontrolled, based on emission factor for residential woodstoves	94
Formaldehyde	50000		Natural gas combustion	Commercial/institutional	103006	0.095 ng/J heat input	Control status unspecified, based	106

Ref No. 1

920916DTG01 REF. No. 2

DTE-543-89

COMMONWEALTH OF VIRGINIA
Department of Air Pollution Control

INTRA-AGENCY MEMORANDUM

TO: Director, DTE

FROM: Air Toxics Program Coordinator

SUBJECT: Toxic Air Pollutants and Emission Factors for Utility-Sized Boilers

DATE: October 26, 1989

Per your request, I have assembled information on the possible toxic emissions from utility-sized (e.g. cogenerators) boilers. Most of the information presented here is based on limited testing or worse. These factors are intended to be used in the absence of facility-specific information or as a check to such information. The following tables represent a summary of the emissions information for the most common fuels, combustion types and control devices.

Coal Combustion / Spreader Stoker

(pounds per trillion Btu's)

Pollutant	Uncontrolled	Multiclone	ESP
Arsenic	403	197	50
Beryllium		27.9	5.9
Cadmium[1]	32	18.3	8.2
Chromium	1256	725	357.5
Copper	697.5	427.5	107.5
Manganese[1]	2170	603	253
Mercury[1]	16	16	12
Nickel	1032.5	523	281.5
Selenium[1]		127	
Vanadium	135.1	57.9	91.6
Formaldehyde	170.5		170.5

1 These pollutants are not exempt by strict interpretation of the regulation. However, in all but the most unusual circumstances (e.g. extremely large facilities or very poor release characteristics) the resulting emissions are insignificant and could be ignored.

Distillate Oil Combustion

(pounds per trillion Btu's)

Pollutant	Uncontrolled	Multiclone	ESP	Scrubber
Arsenic[1]	4.2	2.06	0.50	0.42
Beryllium[1]	2.5	1.58	0.35	0.15
Cadmium[1]	10.5	7.45	1.58	0.63
Chromium[1]	47.5	27.8	13.92	3.84
Copper	280	165.2	42	25.2
Manganese[1]	14	6.44	3.08	1.54
Mercury[1]	3.0	3.0	2.25	0.78
Nickel	170	86.7	47.6	6.8
Selenium[1]	6.4			
Vanadium	69.6			
Formaldehyde	1182			

Residual Oil Combustion

(pounds per trillion Btu's)

Pollutant	Uncontrolled	Multiclone	ESP	Scrubber
Arsenic[1]	19	9.31	2.28	1.90
Beryllium	4.2	2.65	0.59	0.25
Cadmium	15.7		9.9	3.96
Chromium[1]	21	12.18	6.09	1.68
Copper	278	165.2	42.0	25.2
Manganese[1]	26	11.96	5.72	2.86
Mercury[1]	3.2	3.2	2.4	0.83
Nickel	1260	642.6	352.8	50.4
Vanadium	3517		703	
Formaldehyde	3390			

1 These pollutants are not exempt by strict interpretation of the regulation. However, in all but the most unusual circumstances (e.g. extremely large facilities or very poor release characteristics) the resulting emissions are insignificant and could be ignored.

Wood Combustion[2]

Pollutant	Uncontrolled (pounds per trillion Btu's)
Benzene	14,708
Benzo (a)pyrene[3]	700
Chrysene[3]	1858
Fluoranthene[3]	2604
Formaldehyde	513
Napthalene	33,950
Phenanthrene[3]	13,089
Phenol	5317
Pyrene[3]	2604

2 Emission factors for wood combustion were derived from VOC weight percentages as measured from residential wood stoves and applied to VOC emission factors for utility boilers. They are highly variable with wood moisture content and species and boiler type. The factors should be used with a great deal of caution. Emission testing should be specified on future permits for large wood-burning boilers in order to establish better emission factors.

3 These substances have no TWA but are suspected carcinogens and their emissions should be minimized to the extent possible.

Natural Gas Combustion

Pollutant	Uncontrolled (pounds per trillion Btu's)
Benzene	68
Formaldehyde	136

I have supplied copies of this memo to the Air Toxics Engineers and request comments, corrections and additions. In its present form, this information represents the best estimates that I can make with limited emissions data. The attached printouts are from the Air Toxics Emission Factor database.

Charles E. Holmes

attachments (addressee only)

cc: Air Toxics Engineers

BLACK & VEATCH - FLORIDA POWER
****

9209160560
Ref No. 3

ESTIMATED PERFORMANCE - PG7221(FA)

LOAD CONDITION			BASE	80%	60%	50%	40%	20%
AMBIENT TEMP.		- Deg F.	40	40	40		40	40
AMBIENT RELATIVE HUMID		- %	70	70	70		70	70
OUTPUT		- kW	165000.	131900.	99400.		66100.	32900.
HEAT RATE (LHV)		- Btu/kWh	9530.	10270.	11630.		13970.	19860.
HEAT CONS. (LHV)	X10-6	- Btu/h	1572.5	1354.6	1156.0		923.4	653.4
EXHAUST FLOW	X10-3	- lb/h	3500.0	2903.0	2500.0		2123.0	1901.0
EXHAUST TEMP		- Deg F.	1089.	1157.	1200.		1200.	1055.
EXHAUST HEAT	X10-6	- Btu/h	955.0	857.3	775.8		663.9	515.0
NOX		- ppmvd @ 15% 02	12.	12.	12.		12.	124.
NOX AS NO2		- lb/h	76.	65.	55.	50	44.	313.
CO		- ppmvd	25.	25.	25.		*	*
CO		- lb/h	80.	65.	57.		*	*
UHC		- ppmvv	7.	7.	7.		*	*
UHC		- lb/h	14.	11.	10.		*	*
PART		- lb/h	9.0	9.0	9.0		9.0	9.0

EXHAUST ANALYSIS % VOL.

ARGON	0.90	0.90	0.89	0.90	0.90
NITROGEN	74.76	74.67	74.72	74.91	75.49
OXYGEN	12.67	12.43	12.57	13.11	14.76
CARBON DIOXIDE	3.78	3.89	3.83	3.58	2.82
WATER	7.89	8.11	7.99	7.50	6.03

SITE CONDITIONS
****

ELEVATION	- ft.	163
SITE PRESSURE	- psia	14.62
INLET LOSS	- in. Water	3.5
EXHAUST LOSS	- in. Water	12
RELATIVE HUMIDITY	- %	70
FUEL TYPE	-	CUST GAS
FUEL LHV	- Btu/lb	20790
APPLICATION	-	317S HYDROGEN COOLED GENERATOR
COMBUSTION SYSTEM	-	DRY LOW NOX

EMISSION INFORMATION BASED ON GE RECOMMENDED MEASUREMENT METHODS.
NOx EMISSIONS ARE CORRECTED TO 15% 02 WITHOUT HEAT RATE CORRECTION AND ARE NOT CORRECTED TO ISO REFERENCE CONDITIONS PER 40CFR 60.335(a)(1)(i).
NOx LEVELS SHOWN WILL BE CONTROLLED BY ALGORITHMS WITHIN THE SPEEDTRONIC CONTROL SYSTEM.

* DATA CURRENTLY NOT AVAILABLE

IPS-8585
JAH 6-9-92

BLACK & VEATCH - FLORIDA POWER
****

9209160360l
Ref No. 4

ESTIMATED PERFORMANCE - PG7221(FA)

LOAD CONDITION			BASE	80%	60%	40%	20%
AMBIENT TEMP.		- Deg F.	40	40	40	40	40
AMBIENT RELATIVE HUMID		- %	70	70	70	70	70
OUTPUT		- kW	178200.	143200.	106900.	70500.	35800.
HEAT RATE (LHV)		- Btu/kWh	10100.	10860.	12270.	14580.	18880.
HEAT CONS. (LHV)	X10-6	- Btu/h	1799.8	1555.2	1311.7	1027.9	675.9
EXHAUST FLOW	X10-3	- lb/h	3652.0	3028.0	2551.0	2152.0	2027.0
EXHAUST TEMP		- Deg F.	1071.	1142.	1200.	1200.	1027.
EXHAUST HEAT	X10-6	- Btu/h	997.5	900.1	809.4	684.5	527.0
WATER FLOW		- lb/h	129530.	109860.	88920.	63480.	0.
NOX		- ppmvd @ 15% 02	42.	42.	42.	42.	240.
NOX AS NO2		- lb/h	318.	273.	228.	177.	660.
CO		- ppmvd	30.	30.	50.	80.	*
CO		- lb/h	96.	79.	112.	152.	*
UHC		- ppmvw	7.	10.	20.	40.	*
UHC		- lb/h	15.	17.	29.	51.	*
SO2		- ppmvw	11.	12.	12.	11.	8.
SO2		- lb/h	92.	80.	67.	53.	35.
SO3		- ppmvw	1.	1.	1.	1.	0.
SO3		- lb/h	6.	5.	5.	3.	2.
SULFUR MIST		- lb/h	10.	8.	7.	6.	4.
PART		- lb/h	17.0	17.0	17.0	17.0	17.0

EXHAUST ANALYSIS % VOL.

ARGON	0.87	0.86	0.86	0.87	0.92
NITROGEN	71.09	70.92	71.10	71.91	76.13
OXYGEN	10.93	10.61	10.72	11.56	14.96
CARBON DIOXIDE	5.31	5.49	5.45	5.04	3.57
WATER	11.81	12.13	11.88	10.62	4.42

SITE CONDITIONS
****

ELEVATION	- ft.	163
SITE PRESSURE	- psia	14.62
INLET LOSS	- in. Water	3.5
EXHAUST LOSS	- in. Water	12
RELATIVE HUMIDITY	- %	70
FUEL TYPE	-	DISTILLATE
FUEL LHV	- Btu/lb	18550
APPLICATION	-	317S HYDROGEN COOLED GENERATOR
COMBUSTION SYSTEM	-	DRY LOW NOX

EMISSION INFORMATION BASED ON GE RECOMMENDED MEASUREMENT METHODS.
NOx EMISSIONS ARE CORRECTED TO 15% 02 WITHOUT HEAT RATE CORRECTION AND ARE NOT CORRECTED TO ISO REFERENCE CONDITIONS PER 40CFR 60.335(a)(1)(i).
NOx LEVELS SHOWN WILL BE CONTROLLED BY ALGORITHMS WITHIN THE SPEEDTRONIC CONTROL SYSTEM.

DISTILLATE FUEL IS ASSUMED TO HAVE .015% FUEL BOUND NITROGEN, OR LESS.
FBN AMOUNTS GREATER THAN .015% WILL ADD TO THE REPORTED NOx VALUE.
SULFUR EMISSIONS BASED ON .05 WT% SULFUR CONTENT IN THE FUEL.

* DATA CURRENTLY NOT AVAILABLE

IPS-8585
JAH 7-22-92

Emission estimates are for a single CC unit and were based on **General Electric's performance guarantees** for a dry low NO_x combustion system (DLN III) for their PG-7221 FA **combustion** turbine. Florida Power Corporation has received verbal commitments from other manufacturers that their future turbines will be capable of meeting the proposed BACT levels. Emission estimates have not been corrected to ISO conditions or for fuel bound nitrogen.

Natural Gas

Nitrogen Oxides[1]: 12ppmvd --- 76.0 lb/hr

Carbon Monoxide: 25ppmvd --- 80 lb/hr

Volatile Organic Compounds[2]: (14lb/hr)(0.80) = 11.2 lb/hr

Particulate Matter: 9.0 lb/hr

Sulfur Dioxide[3]: (1572.5mmBtu/hr)(1/918mmBtu/mmSCF)(.61b/mmSCF) = 1.03 lb/hr
Sulfuric Acid Mist[3]:(1.03lb/hr)(mols/64lb)(.07)(98lb/mol)= 0.11lb/hr
Benzene[4]:(1572.5mmBtu/hr)(6.8E-5lb/mmBtu) = 0.107lb/hr

Formaldehyde[4]:(1572.5mmBtu/hr)(2.20E-4lb/mmBtu)=0.346lb/hr

Fuel Oil

Nitrogen Oxides: 42ppmvd --- 318lb/hr

Carbon Monoxide: 30ppmvd --- 96lb/hr

Volatile Organic Compounds:(15lb/hr)(0.80) = 12lb/hr

Particulate Matter: 17lb/hr

Sulfur Dioxide[5]: 92lb/hr + (6lb/hr)(mol/80lb)(64lb/mol)= 98.4lb/hr
Sulfuric Acid Mist: 10lb/hr

Formaldehyde:(4.05E-4lb/mmBtu)(1799.8mmBtu/hr) = 0.729lb/hr

Benzene:(13.4lb/ton$_{UHC}$)(15lb$_{UHC}$/hr)(ton/2000lb) = 0.1005lb/hr

Trace Metals[6]:4.24lb/hr

Potenetial Emissions are based on the current definition contained in Rule 17-2.100(168), F.A.C. and the use of natural gas and low sulfur fuel oil. Emission estimates obtained as described in Attachment CCU-1.

Natural Gas - Potential emissions based on operating 8760 hr/yr.

Fuel Oil - Potential emissions based on operating a maximum of 500 hr/yr on fuel oil.

The total worst case emissions are for natuaral gas at 8260 hr/yr and fuel oil for 500 hr/yr for 4 CC units, except for benzene.

Carbon Monoxide:[4][(80)(8260)+(96)(500)][1/2000] = 1417.60 TPY

Nitrogen Oxides:[4][(76)(8260)+(318)(500)][1/2000] = 1573.52 TPY

Sulfur Dioxide:[4][(0.956)(8260)+(98.4)(500)][1/2000] = 114.19 TPY

Particulate Matter:[4][(9)(8260)+(17)(500)][1/2000] = 165.68 TPY

VOC:[4][(11.2)(8260)+(12)(500)][1/2000] = 197.02 TPY

Benzene:[4][(0.107)(8760)][1/2000] = 1.87 TPY

Formaldehyde:[4][(.335)(8260)+(.729)(500)][1/2000] = 6.47 TPY

Trace Metals:[4][(4.24)(500)][1/2000] = 5.24 TPY

TABLE 4-6
OTHER REGULATED AND HAZARDOUS POLLUTANT EMISSIONS
(940 MW - CC UNITS)

Pollutant	Emission Rate[1] (lb/mmBtu)	Annual Emission[2] (tpy)
• Antimony	0.0000221	0.0398
• Arsenic	0.0000042	0.00756
• Barium	0.0000195	0.0351
• Beryllium	0.0000025	0.00450
• Boron	0.0000651	0.117
• Cadmium	0.0000105	0.0189
• Calcium	0.000747	1.34
• Chromium	0.000048	0.0854
• Cobalt	0.00000906	0.0163
• Copper	0.00028	0.504
• Lead	0.0000089	0.0160
• Magnesium	0.000232	0.418
• Manganese	0.000014	0.0252
• Mercury	0.000003	0.00540
• Nickel	0.00017	0.306
• Selenium	0.00000235	0.00423
• Vanadium	0.0000696	0.125
• Zinc	0.000683	1.23
Volatile Organic Compounds		
• **Benzene**	**0.000068**	**1.87**
• **Formaldehyde**	**0.000405**	**6.47**

Notes:
1. Emission rates are for four CC units fired on fuel oil only, except for benzene which is for natural gas only.
2. Annual emissions are based on four CC units operating for 500 hours per year firing fuel oil at 40°F and 70 percent relative humidity, except for benzene which is based on 8,760 hours per year of natural gas firing.

Source: EPA, 1988

TABLE 4-7
SUMMARY OF BACT ANALYSIS RESULTS (CC UNITS)

Pollutant	Emission Rate (lbs/hr) (NG/FO)	Control Technology
CO	73/89	Good combustion control and limited annual fuel oil operation (25/30 ppmvd)
NO_x	70/291	Advanced design combustion control and limited annual fuel oil operation (12/42 ppmvd)
SO_2	0.951/90	Low fuel oil sulfur content (0.05 percent) and limited annual fuel oil operation
PM/PM_{10}	9/17	Good combustion control and limited annual fuel oil operation
VOC	10.4/11.2	Good combustion control (6/6 ppmvd)
Beryllium	Negligible/0.0041	Good combustion control and limited annual fuel oil operation
Sulfuric Acid Mist	0.0995/9	Low fuel oil sulfur content (0.05 percent) and limited annual fuel oil operation
Benzene	**0.107/0.1005**	Good combustion control

Note: Emission rates based on a single GE Frame 7FA CT operating at 72°F and 80 percent relative humidity.

Source: Black & Veatch, 1992

TABLE 7-9
AIR TOXICS ANALYSIS [1]
PHASE I — 940 MW

Pollutant	Emission [2] (g/s)	FDER NTLs ($\mu g/m^3$)			Maximum Predicted Concentration ($\mu g/m^3$)			Acceptable
		8-Hour	24-Hour	Annual	8-Hour	24-Hour	Annual[5]	
Volatile Organic Compounds [4]								
Benzene *	0.054	30	7.2	0.12	0.013	0.0065	0.00045	Yes
Formaldehyde *	**0.368**	12	2.88	0.077	**0.0883**	**0.0464**	**0.0015**	Yes

(1) Analysis is for the four (4) 235 MW CC units only.
(2) Emission estimates obtained from EPA, 1988, and EPA, 1989.
(3) Trace metal emissions based on four (4) 235 MW CC units fired on fuel oil.
(4) Volatile organic compound emissions based on four (4) 235 MW CC units fired on natural gas.
(5) Based on natural gas firing for 8260 hrs/yr and fuel oil firing for 500 hrs/yr.

* Listed pollutant under Title III of the CAA Amendments of 1990

NTL = "No Threat" Level (FDER, 1992, Draft Air Toxics Guidelines)

N/A = Not Applicable

Source: Ebasco Environmental, 1992

Request 4. The emission information provided for the PG-7221 FA combustion turbine at different load conditions and ambient temperatures in Attachment CCU-1 was based on GE recommended measurement methods. Please identify any differences between the different GE test methods employed and the EPA test methods. Also, provide stack test information and data for each pollutant tested, and fuel analysis data for the fuel burned during the test.

Response 4. The emission information provided for the PG-7221 FA combustion turbine in Attachment CCU-1 was supplied by GE. Measurement methods recommended by GE are the basis for verifying attainment of certain GE emission guarantees. FPC recognizes that actual emissions compliance testing will have to be conducted in accordance with EPA approved test methods. Therefore, it's in FPC's best interests to ensure that the GE recommended test methods (e.g., the basis for verifying emission guarantees provided by GE) and EPA approved test methods (the basis for demonstrating compliance) are consistent. FPC has evaluated the GE test methods and determined that there are no significant differences between the GE recommended methods and those approved by EPA, except for one: EPA Method 2 (Determination of Stack Gas Velocity and Volumetric Flow Rate) has not been used to assess volumetric flow rates.

The principle objection to the use of Method 2 for gas turbine flow assessments stems from the wide variability of the exhaust gas velocities measured across the plane of the high temperature exhaust stack at the test port locations. This wide variation in velocity tends to skew the statistical flow measurement results. Indicated flow values obtained by this test method, in GE's experience, are typically greater than predicted flow values calculated from detailed thermodynamic computer models run at corresponding test operating conditions, by as much as 25 percent. Flow increases on this order, if accurate, would produce proportionate increases in the thermal performance characteristics (i.e., output and fuel consumption) which are not observed at test conditions. Alternatively, Method 19, which calculates volumetric flow rates stoichiometrically, has been proposed and successfully used by GE and others in the emission testing industry to more accurately assess gas turbine exhaust flow rates for emission compliance assessments. Consequently, GE's test experience to date centers primarily on the use of Method 19 for flow determinations, whereas Method 2 has been utilized for establishing iso-kinetic sampling conditions during particulate test mearurements where required. For installations where regulators have insisted on the use of Method 2, GE has incorporated both Method 2 and Method 19 within the test protocol due to concerns over measurement accuracy.

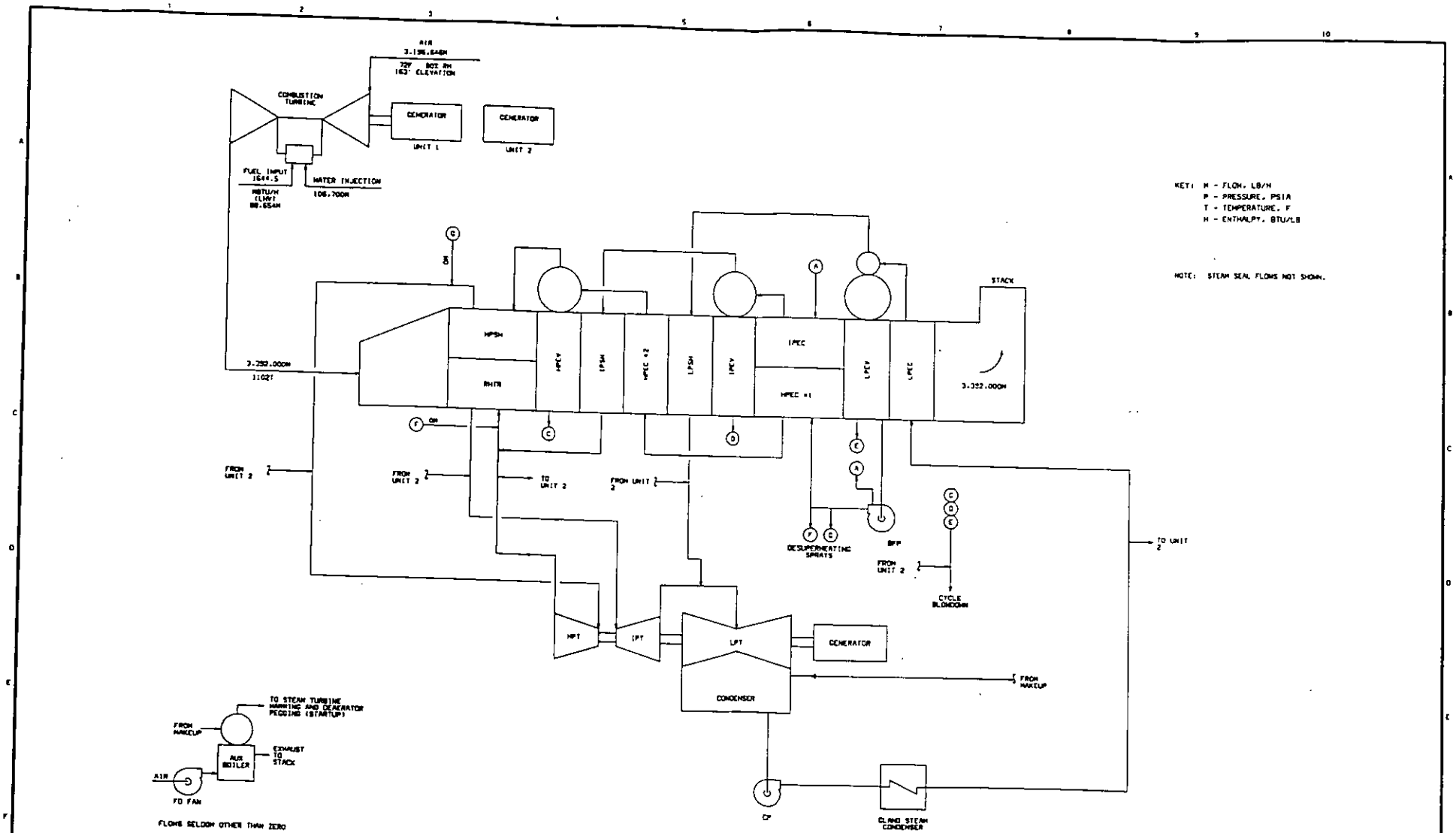
The second part of FDER Request 4 asks for GE stack test data relative to the PG-7221 FA combustion turbine. On October 8, 1992, a conference call was held between Messrs. Chuck Nelson and Mike Davi of GE, Scott

Osbourn of FPC, and Syed Arif, the FDER permit engineer. The conference call provided an opportunity to both clarify the request and discuss the basis of the emissions estimates provided to FDER. Mr. Arif was told that GE emission testing is conducted on full size single combustors at various machine temperatures, pressures, and flows. Interpretation of the data involves computer simulations and operating assumptions for commercial grade combustors which are yet to be built. The discussion concluded that the test data requested by FDER would not be useful for an evaluation of the emissions data upon which the FPC application is based.

Request 5. Please submit a detailed process flow diagram for the combined cycle units and the auxiliary boiler showing the volumetric air flow rates for each stream when burning natural gas and fuel oil. Also provide a plot plan for both alternatives giving a detailed overview of all equipment and stacks associated with the project, if available. Figure 2-2 submitted with the application is not sufficient.

Response 5a. Four flow diagrams are attached. As indicated, auxiliary boiler flows are zero during periods when the combined cycle units are in operation. However, combustion air flow would be 87,075 lb/hr and or 88,231 lb/hr for natural gas and fuel oil, respectively, based on scaling the numbers in Attachment 1 to the application for the Nebraska Boiler.

Response 5b. Plot plan arrangements are included for both the two-on-one and one-on-one steam turbine arrangements. With the one-on-one arrangement, the centerline of the two combustion turbines farthest away from the control building moves approximately 70 feet. This movement would have no significant impact on the air quality modelling results presented in the application.



NO	DATE	REVISIONS AND RECORD OF ISSUE	BY

BLACK & VEATCH

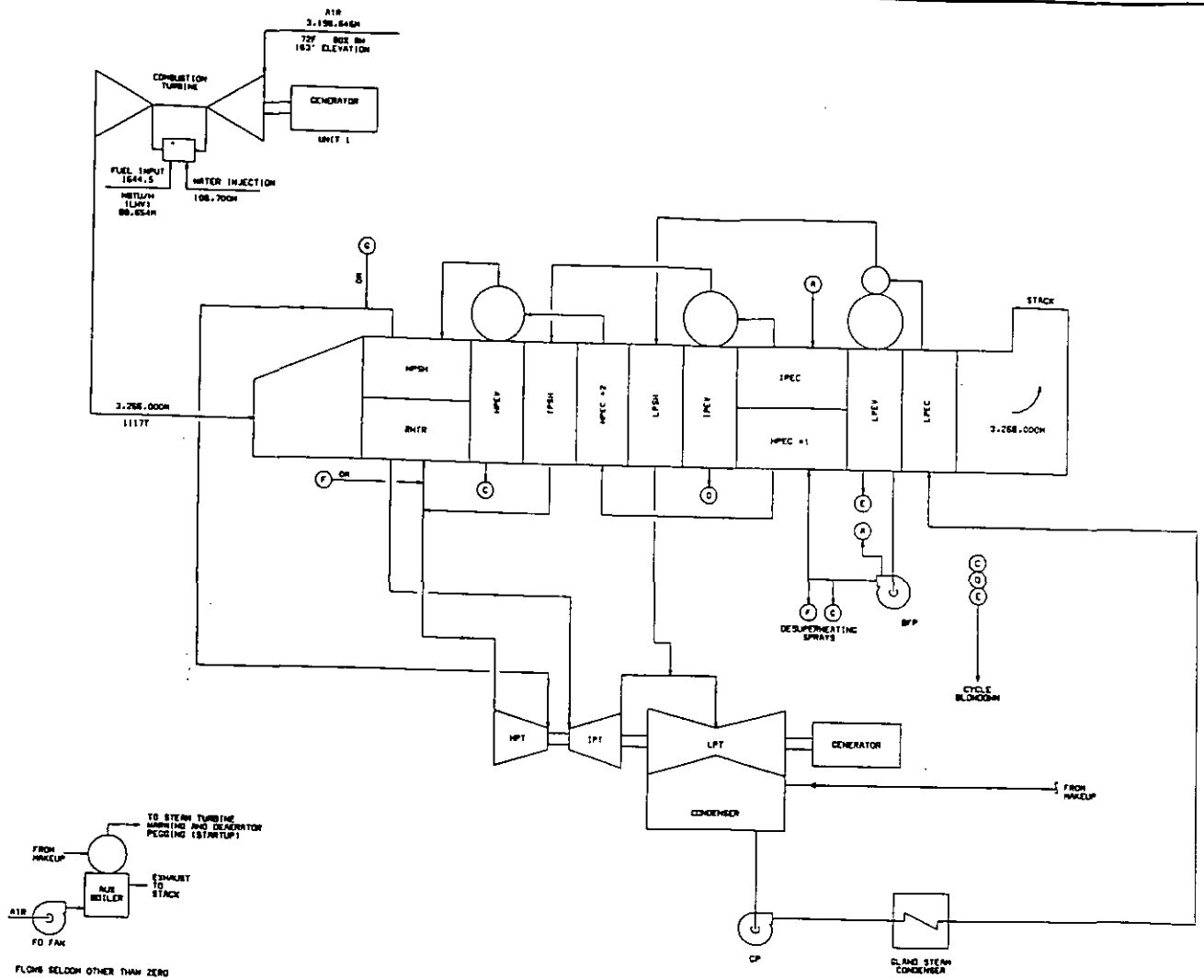
FLORIDA POWER CORPORATION
POLK COUNTY PROJECT

2 ON 1 7FA BLOCK
DISTILLATE OIL

PROJECT 18875-H8-00003

DRAWING NUMBER

REV 0



KEY: M - FLOW, LB/H
P - PRESSURE, PSIA
T - TEMPERATURE, F
H - ENTHALPY, BTU/LB

NOTE: STEAM SEAL FLOWS NOT SHOWN.

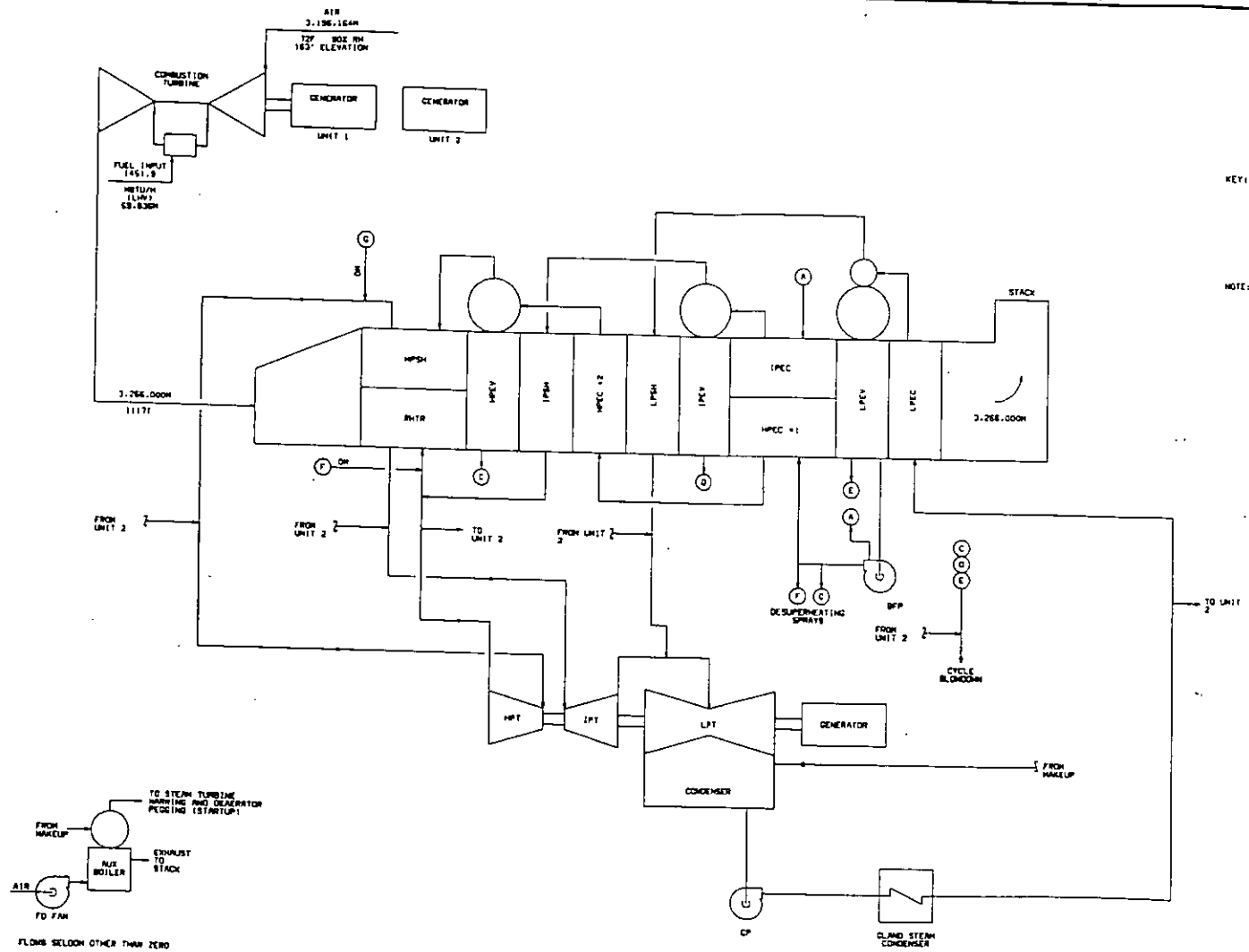
NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK'D	APP'D

BLACK & VEATCH

FLORIDA POWER CORPORATION
POLK COUNTY PROJECT

1 ON 1 7FA BLOCK
DISTILLATE OIL

PROJECT 18875 DRAWING NUMBER HB-00004 REV 0
CODE
AREA



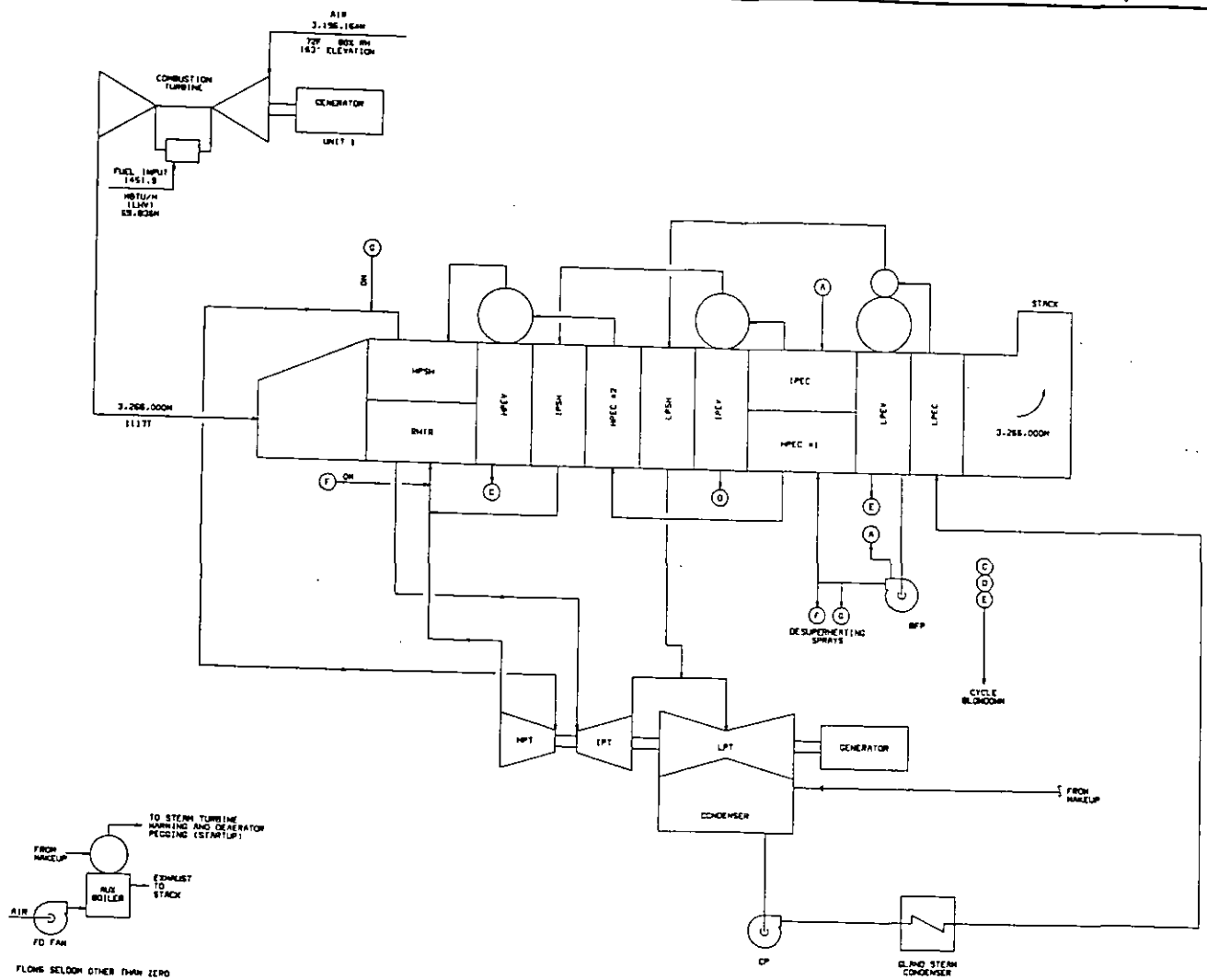
NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP'D

BLACK & VEATCH

ENGINEER	DATE
CHECKED	DATE

FLORIDA POWER CORPORATION
POLK COUNTY PROJECT
2 ON 1 7FA BLOCK
NATURAL GAS

PROJECT	DRAWING NUMBER	KEY
18875-H8-00001		0
CODE		
AREA		



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P - PRESSURE, PSIA
T - TEMPERATURE, F
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NOTE: STEAM SEAL FLOWS NOT SHOWN.

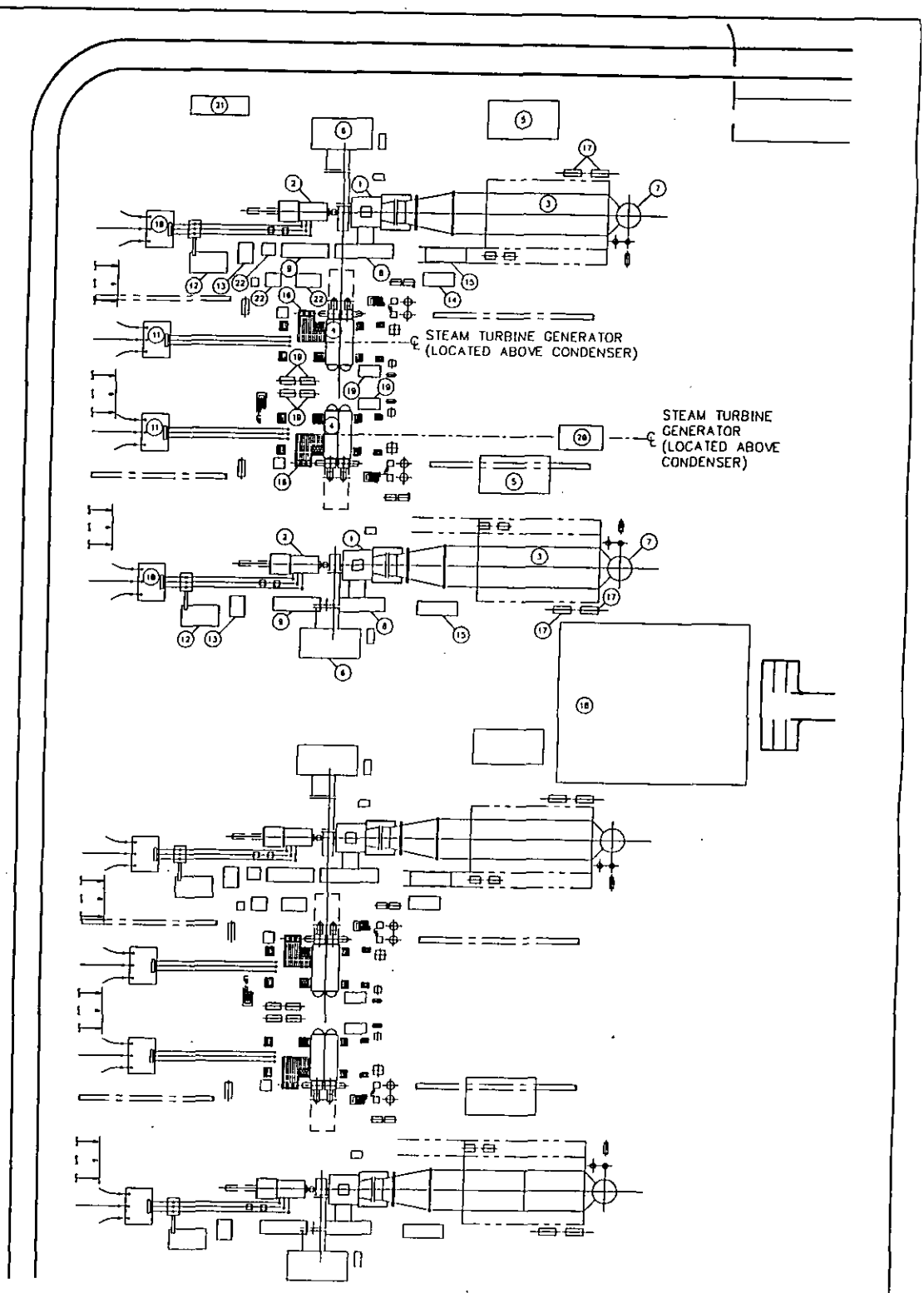
NO	DATE	REVISIONS AND RECORD OF ISSUE	BY/CHK/APP'D

BLACK & VEATCH

FLORIDA POWER CORPORATION
POLK COUNTY PROJECT

1 ON 1 7FA BLOCK
NATURAL GAS

PROJECT 18875-H8-00002 | DRAWING NUMBER | REV 0



ITEM NO.	EQUIPMENT IDENTIFICATION LIST	ITEM NO.	EQUIPMENT IDENTIFICATION LIST
1	COMBUSTION TURBINE	12	AUXILIARY TRANSFORMERS
2	COMBUSTION TURBINE GENERATOR	13	C.T. GENERATOR AUXILARIES
3	HEAT RECOVERY STEAM GENERATOR	14	WASH WATER SKID
4	CONDENSER	15	FUEL FORWARDING SKIDS
5	CT EVAPORATIVE COOLER	16	CONDENSATE PUMPS
6	AIR INLET FILTER	17	BOILER FEED PUMPS
7	STACK	18	COMBINED CYCLE CONTROL/ ADMINISTRATION BUILDING
8	C.T. MECHANICAL ACCESSORIES	19	STEAM TURBINE AUXILIARIES
9	C.T. ELECTRICAL ACCESSORIES	20	AUXILIARY BOILER
10	C.T. GENERATOR TRANSFORMERS	21	DIESEL GENERATOR
11	STEAM TURBINE GENERATOR TRANSFOMERS	22	C.T. STATIC START EQUIPMENT

NO	DATE	DESCRIPTION	BY	CH	APPROVED

REVISIONS

ORIGINATOR: BLACK & VEATCH

SCALE: 1"=80'-0"

DR: ____ CH: ____

DATE: ____

APPROVED:

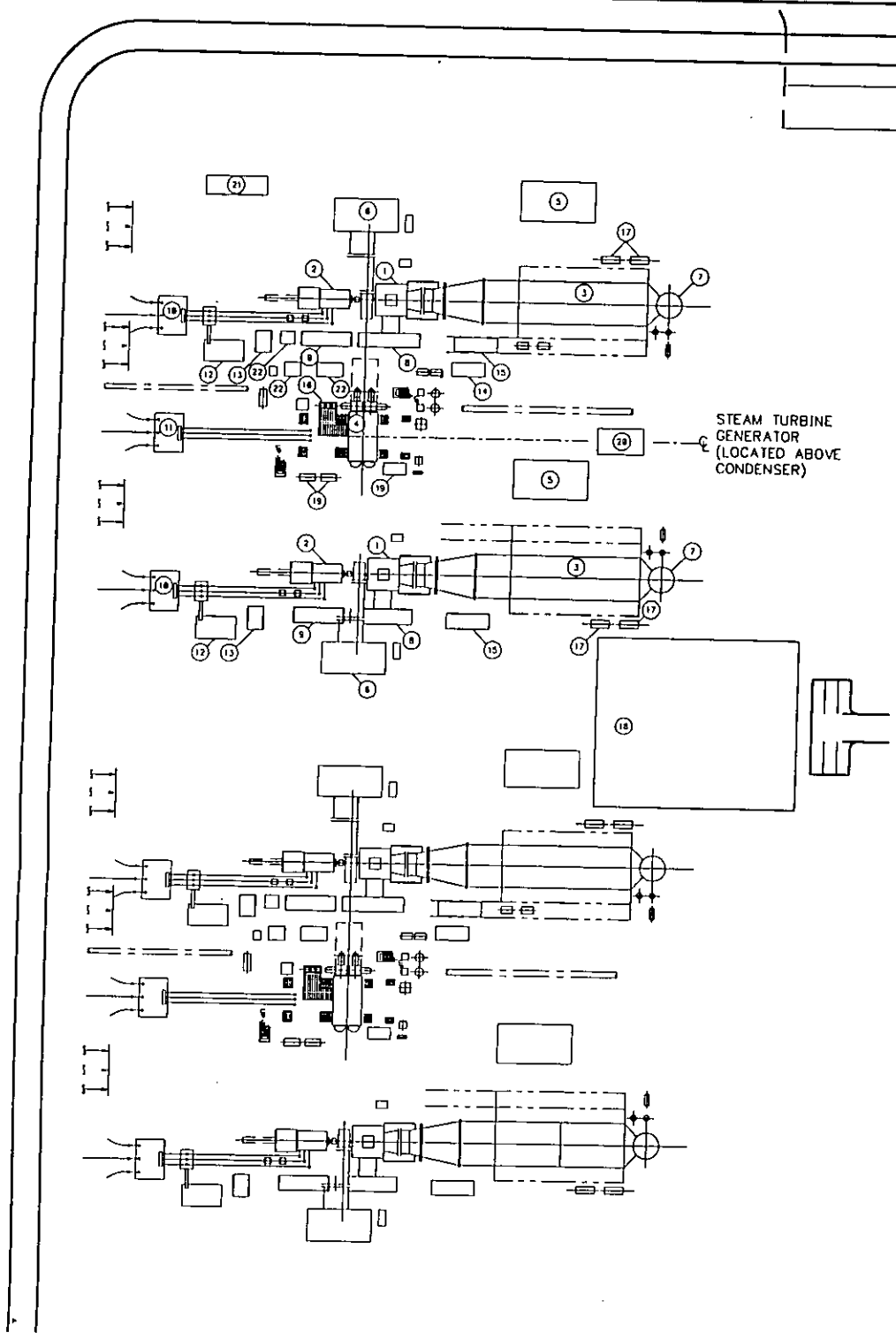
PLANT CODE	UNIT NO	SYSTEM CODE
PC	00	MI

DRAWING NO	REV NO
18875-SAM-0002	0

Polk County Site

FLORIDA POWER CORPORATION
POLK COUNTY SITE

COMBUSTION TURBINE COMBINED CYCLE ONE TO ONE ARRANGEMENT



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NO	DATE	DESCRIPTION	BY	CH	APPROVED

REVISIONS

ORIGINATOR: BLACK & VEATCH

SCALE: 1"=80'-0"

DR: ____ CH: ____

DATE: ____

APPROVED:

PLANT CODE	UNIT NO	SYSTEM CODE
PC	00	MI

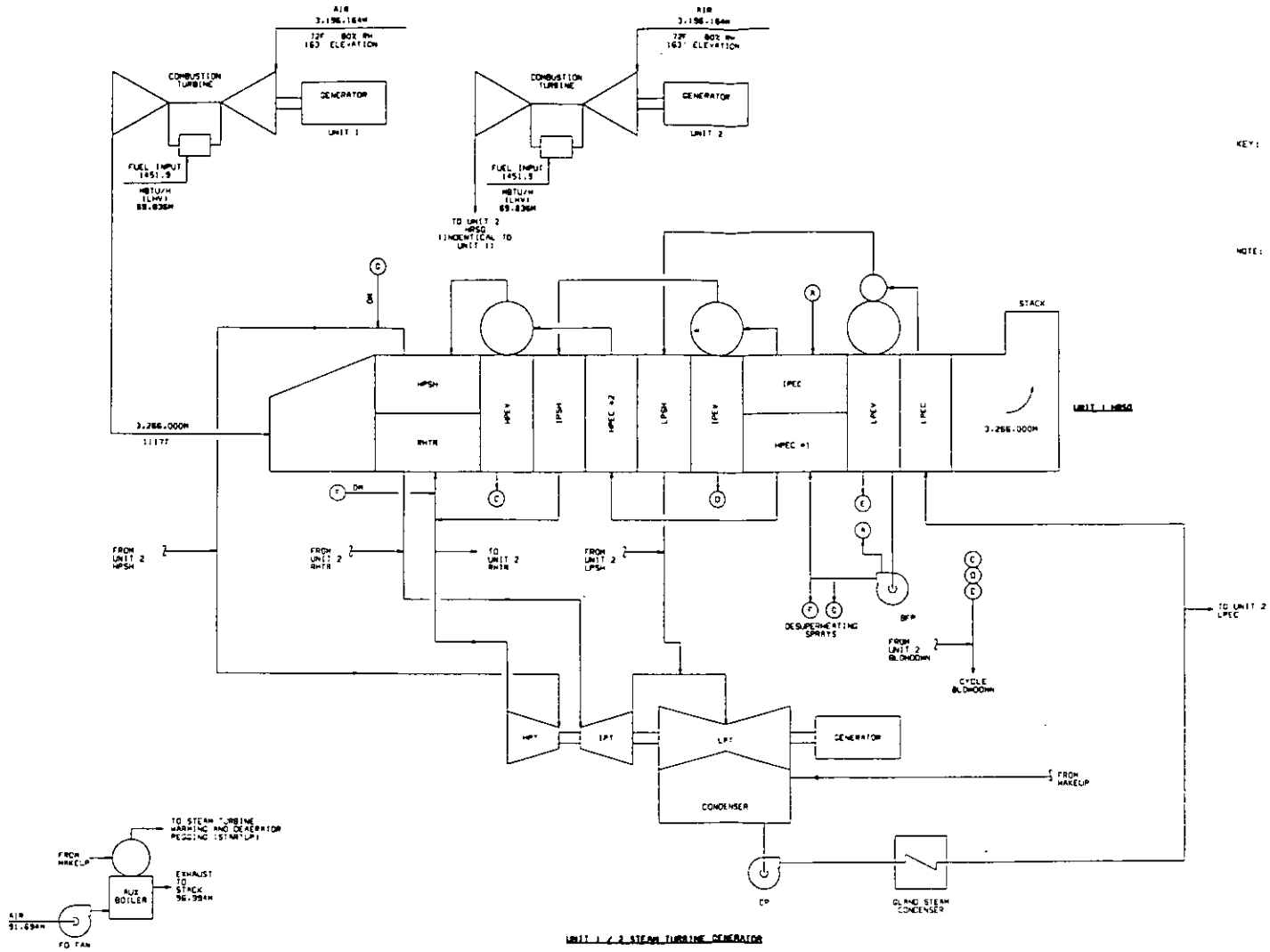
DRAWING NO	REV NO
18875-SAM-0001	0

Polk County Site

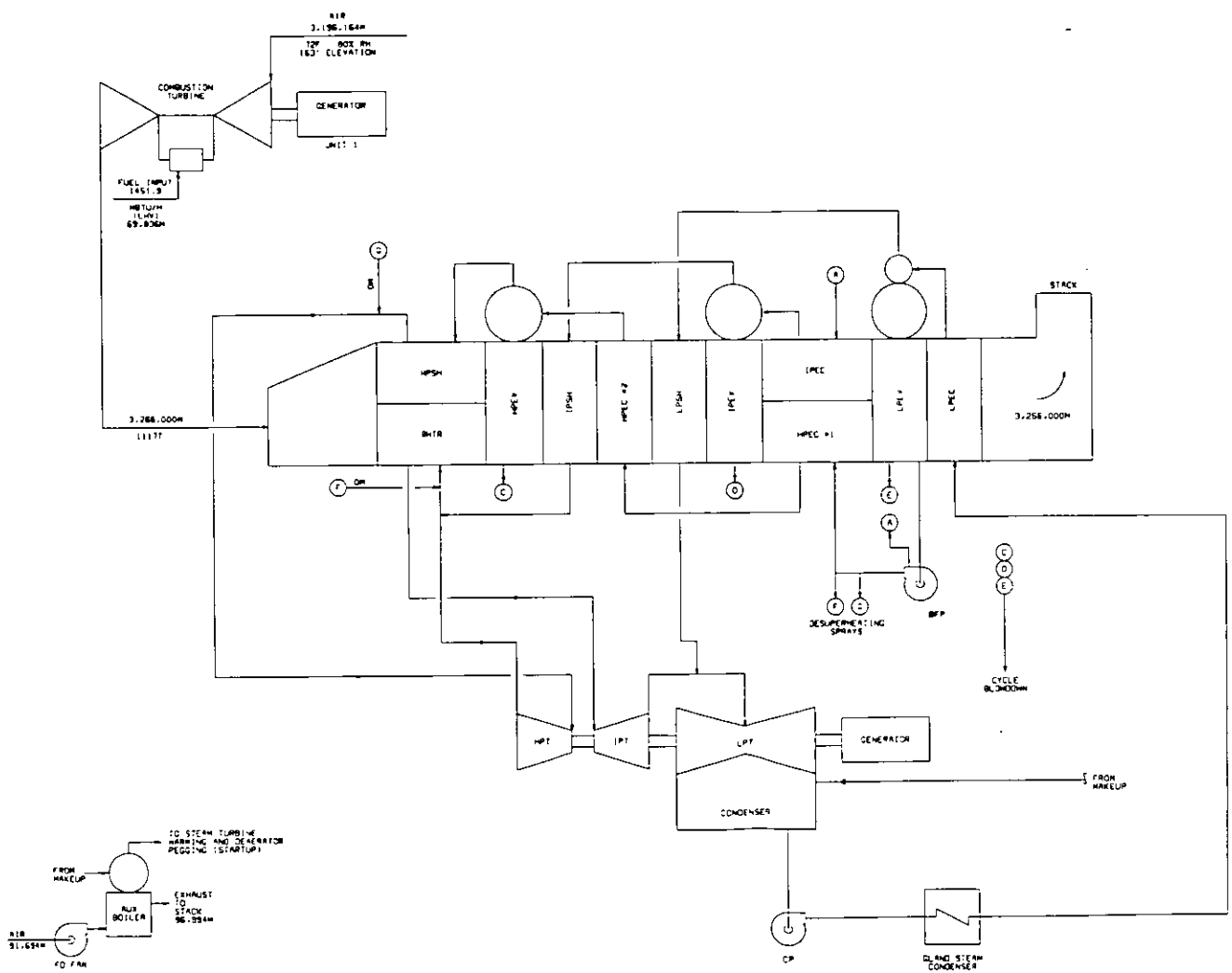
FLORIDA POWER CORPORATION

POLK COUNTY SITE

COMBUSTION TURBINE COMBINED CYCLE TWO TO ONE ARRANGEMENT



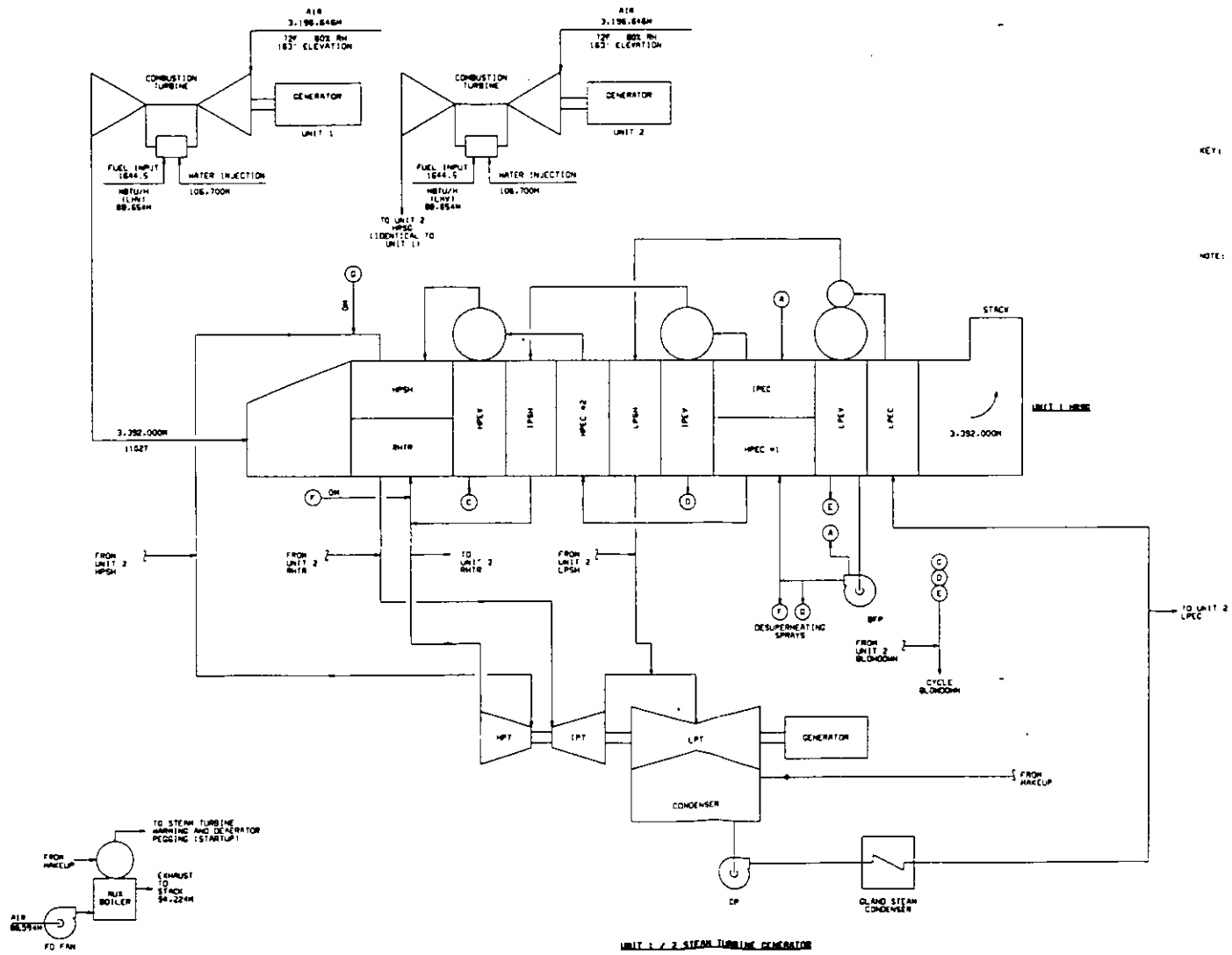
		BLACK & VEATCH	FLORIDA POWER CORPORATION POLK COUNTY PROJECT	PROJECT DRAWING NUMBER: 18875-HB-00001 REV: 0
			2 ON 1 7FA BLOCK NATURAL GAS	CODE
NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY/CHK/APP'D	



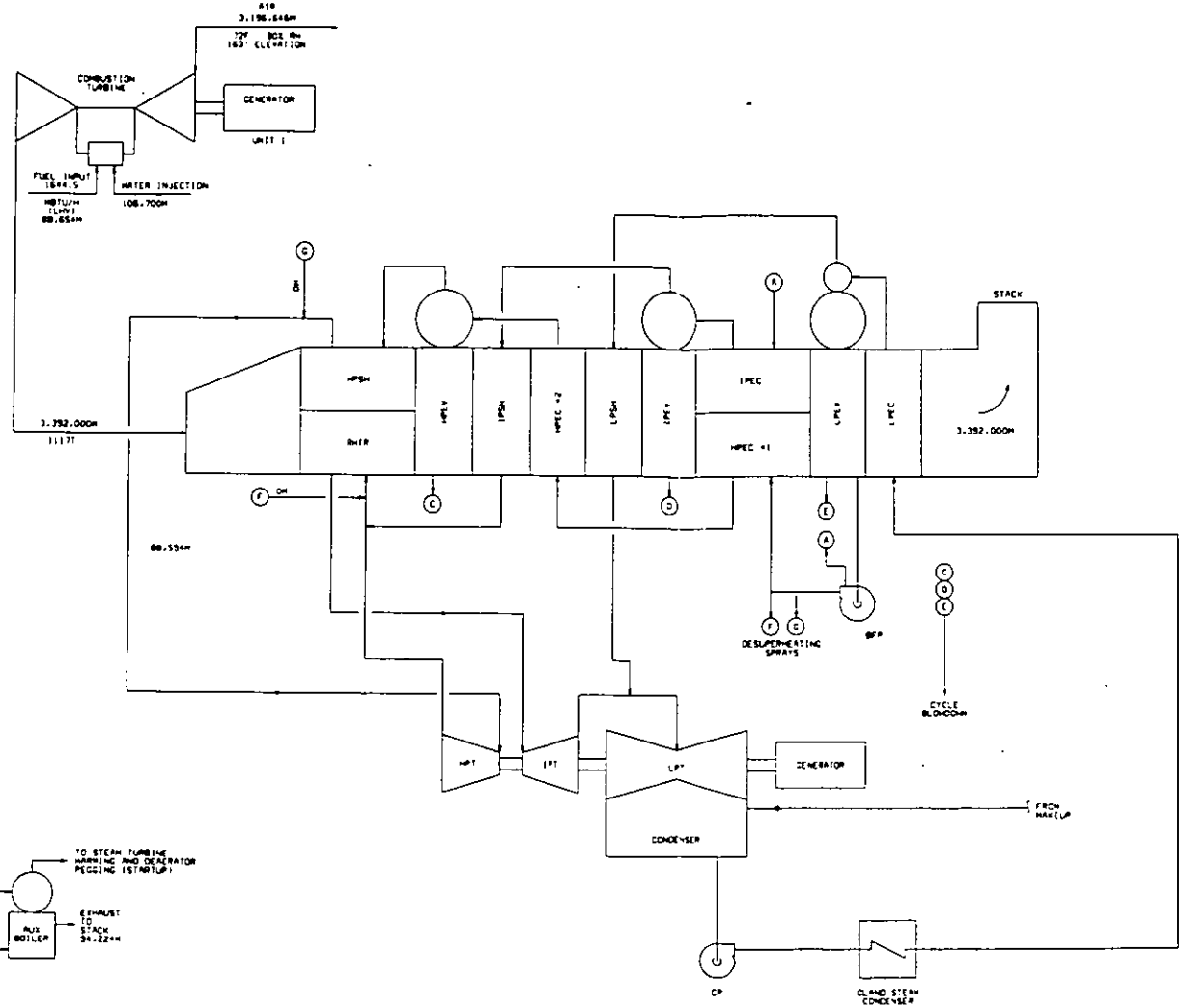
KEY: M - FLOW, LB/H
P - PRESSURE, PSIA
T - TEMPERATURE, F
H - ENTHALPY, BTU/LB

NOTE: STEAM SEAL FLOWS NOT SHOWN.

BLACK & VEATCH	FLORIDA POWER CORPORATION POLK COUNTY PROJECT	18875-HB-00002	0
	1 ON - YEAR BLOCK NATURAL GAS		



	BLACK & VEATCH	FLORIDA POWER CORPORATION POLK COUNTY PROJECT	18875-H8-00003	0
		2 ON - TFA BLOCK DISTILLATE OIL		



KEY: M - FLOW, LB/H
P - PRESSURE, PSIA
T - TEMPERATURE, F
H - ENTHALPY, BTU/LB

NOTE: STEAM SEAL FLOWS NOT SHOWN.

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK'D	APP'D

BLACK & VEATCH

FLORIDA POWER CORPORATION
POLK COUNTY PROJECT

1 ON 1 7FA BLOCK
DISTILLATE OIL

PROJECT 18875-HB-00004

DRAWING NUMBER 0

Request 6. The application states that the liquid and solid wastes generated by the combined cycle units and the auxiliary boiler will be properly disposed of at the site. Please give details of the methods of disposal and the contents of the waste material.

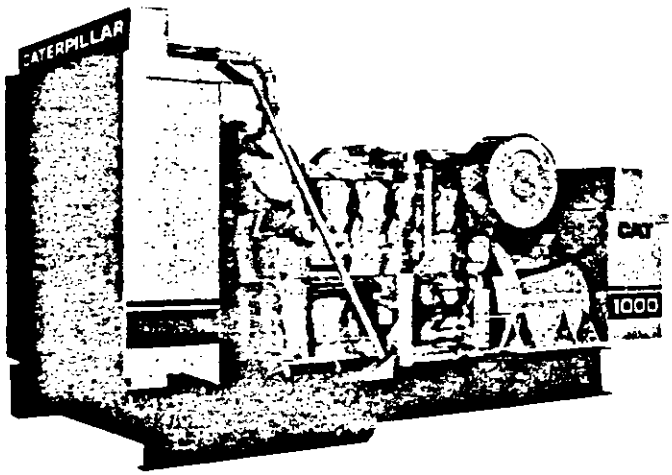
Response 6. Several portions of the Site Certification Application deal with waste materials generated at the site. These include Section 3.5.2 - Domestic/Sanitary Wastewater, Section 3.6 - Chemical and Biocide Waste and By-Products. Various portions of Chapter 5.0, which deal with the effects of plant operation, also discuss liquid and solid waste disposal. The Site Certification Application was submitted to the Department on August 24, 1992. Those portions being referenced here in response to the Department's request should be under review currently by the Bureau of Waste Management, in accordance with the site certification process. Please recognize that the site certification application deals with the wastes generated from the ultimate site capacity of 3200 MW and that much of those wastes would not be involved in the first 940 MW, which is the subject of the PSD application.

Request 7. The project has not been narrowed down to the configuration of combined cycle units that will be employed to generate approximately 940 MW. The Department must know which configuration of the combined cycle units will be used for the project so that a complete BACT determination can be made. Also, provide emissions based on the alternate configuration of two 470 MW combined cycle units.

Response 7. FPC has not yet determined whether the configuration of the 940 MW combined cycle project will include four steam turbines (*i.e.*, the one-on-one configuration) or two larger steam turbines (*i.e.*, the alternate two-on-one configuration). Layouts for both configurations are provided in Response 5b. The number of emission points and the emission rates from the CT/HRSG stacks do not depend on whether there will be one or two steam turbines per two CT/HRSGs. Also, please recognize that the configuration issue does not affect the economic analyses presented in the BACT portion of the application, as indicated in Ms. Kathleen Small's letter to Mr. Syed Arif dated August 26, 1992. Since the emission rates, number of emission points, and the BACT analyses are not dependent upon the configuration selection, the BACT determination by FDER should not be tied to the configuration selection.

Request 8. Please submit the manufacturer's design specifications for the proposed diesel generator. What will be the maximum operating hours per year for the diesel generator?

Response 8. The manufacturer's design specifications are not yet available for the diesel generator since the equipment has not been procured. Catalog information for a typical 1300 kW diesel generator is attached. The specific diesel generator manufacturer's information will be provided after the equipment is procured. FPC requests that the diesel generator operation be limited to no more than 100 hours per year.



Prime Power

Ratings from 45 to 4400 kW, 60 Hz and 45 to 6000 kVA, 50 Hz.

Cat Gen Sets for prime power applications deliver the power you need, when and where you need it. Cat Engines are designed for long life before overhaul. High strength blocks, large bearing areas, steel-backed copper-bonded aluminum alloy bearings and hardened crankshafts provide built-in durability.

All Cat Generators are built to continuous-duty prime power specifications. They feature a brushless type design and are available in all popular voltages. All can include reactive droop compensation for paralleling, plus these standard features:

- Insulation meets or exceeds Class F requirements.
- Tropicalization for extended life in moist, dirty or sandy environments.
- Solid state overload protection.
- Across-the-line motor starting of 0.35 to 0.5 hp per kW for NEMA Code F motors with less than 30% voltage dip.

STANDBY — For continuous electrical service during interruption of normal power.
PRIME — For continuous electrical service with variable loads.
CONTINUOUS — Power and speed capabilities of the engines which can be used without interruption of load.

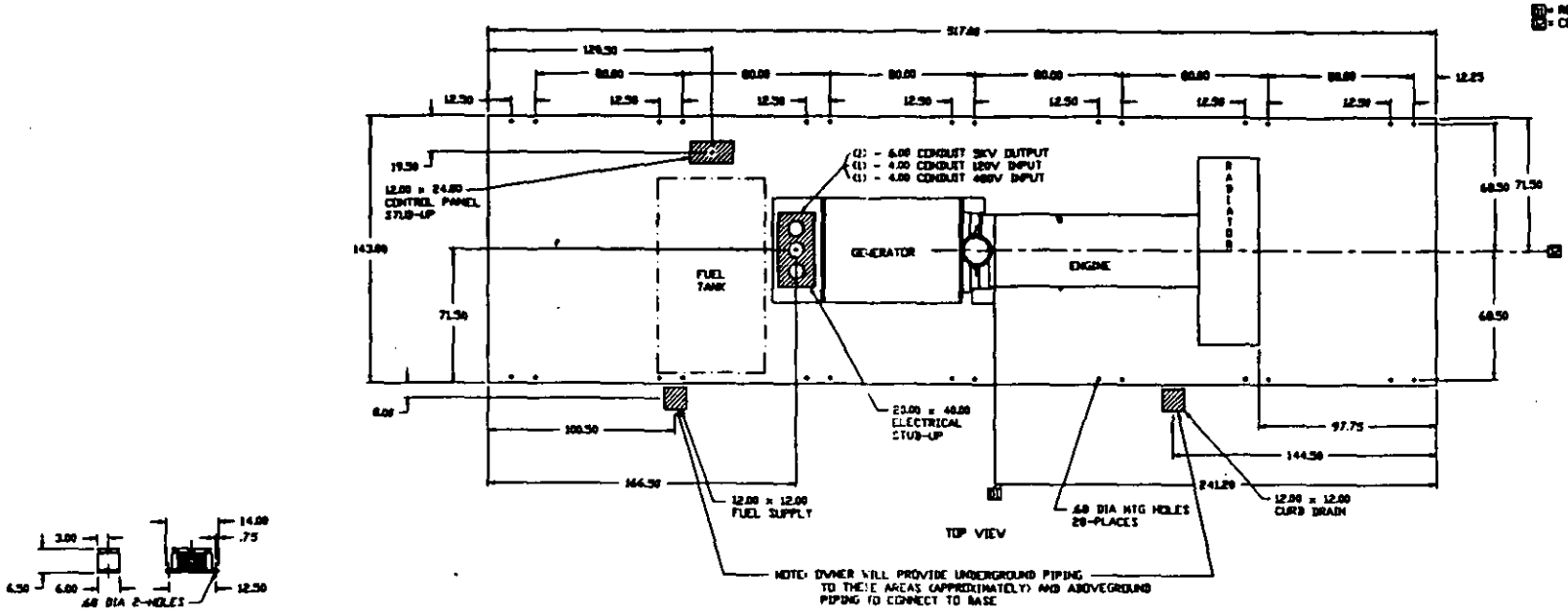
60 Hz RATINGS

Gen Set Model	Cat Engine	Standby kW	Prime kW
	@ 1800 rpm with fan		
50	3114 T	50	45
60	3114 T	60	54
75	3114 TA	75	68
100	3116 T	100	90
125	3116 TA	125	113
150	3208 T	150	135
175	3208 T	175	160
200	3208 ATAAC	200	—
200	3306B TA	200	180
225	3306B TA	225	205
250	3306B ATAAC	250	225
275	3406B TA	275	250
300	3406B TA	300	275
350	3406B TA	350	320
400	3408B TA	400	365
475	3412 T	475	425
500	3412 T	500	455
600	3412 TA	600	545
700	3508 TA	700	650
750	3508 TA	750	680
800	3508 TA	800	725
900	3508 TA	900	820
1000	3508 TA	1000	—
1000	3512 TA	1000	910
1100	3512 TA	1100	1000
1250	3512 TA	1250	1135
1400	3512 TA	1400	—
[illegible]	3512 TA	1500	—
[illegible]	3516 TA	1500	1360
[illegible]	3516 TA	1750	1600
2000	3516 TA	2000	—
	@ 1200 rpm		
185	3406B TA	—	170
250	3408B TA	—	225
360	3412 TA	—	325
615	3508 TA	615	550
925	3512 TA	925	830
1250	3516 TA	1250	1100

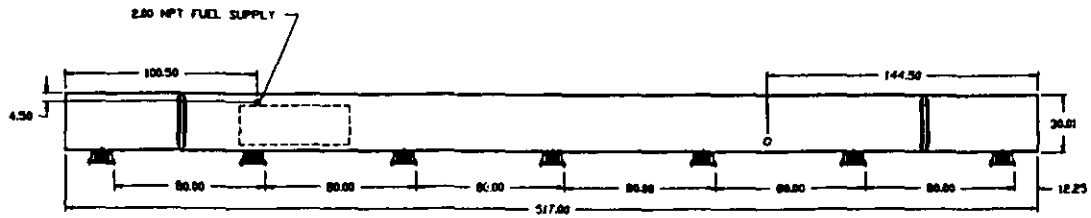
3600 FAMILY

Gen Set Engine	Standby	Prime	Continuous
	@ 900 rpm without fan		
3606 TA	1830	1650	1500
3608 TA	2440	2200	2000
3612 TA	3680	3300	3000
3616 TA	4910	4400	4000
	@ 720 rpm		
3606 TA	1525	1375	1250
3608 TA	2025	1825	1650
3612 TA	3050	2750	2500
3616 TA	4075	3690	3350

kW — Generator output T — Turbocharged
TA — Turbocharged/aftercooled TT — Twin turbochargers
ATAAC — Air-to-air aftercooled



DETAIL OF VIBRATION ISOLATORS



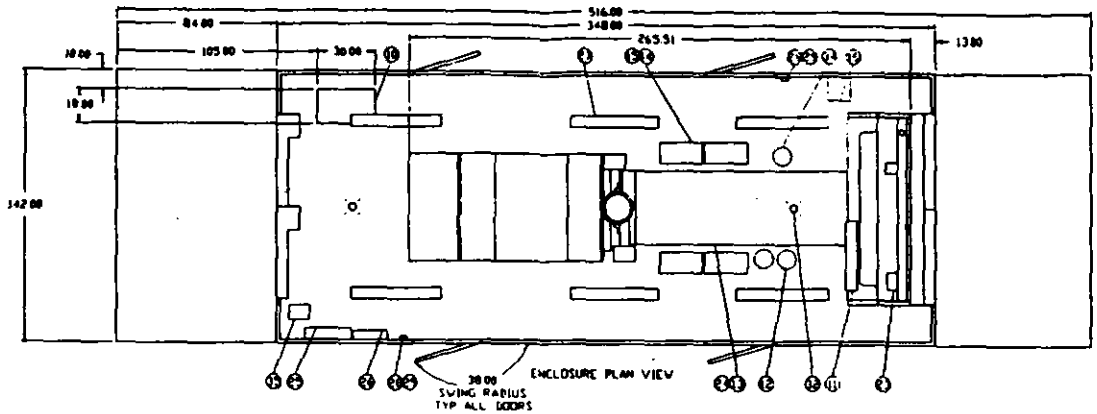
RIGHT SIDE VIEW

ALL DIMENSIONS IN INCHES
DO NOT SCALE DRAWING

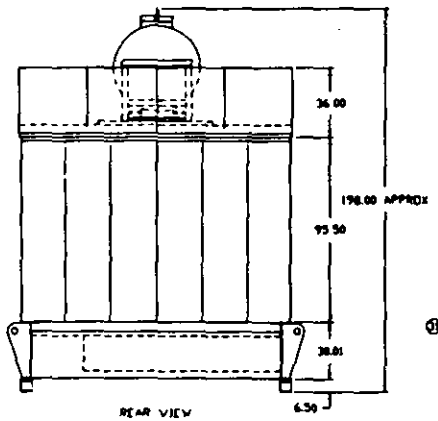
MOUNTING AND STUB-UP LAYOUT

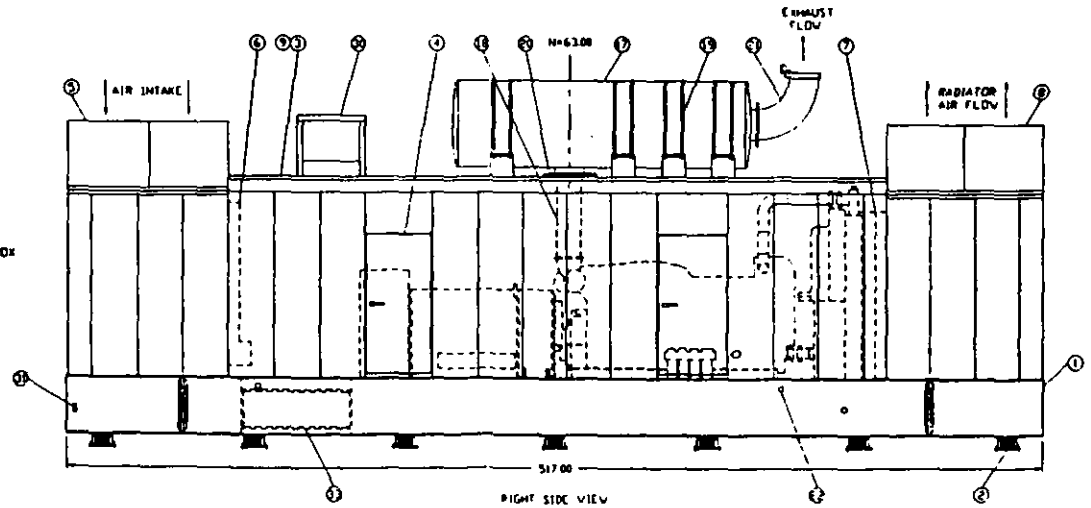
Chillicothe Metal Co.

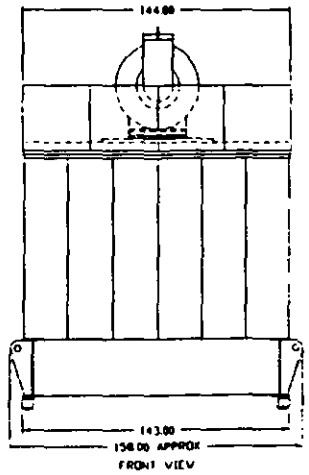
DRAWING NUMBER SK10836-IM



COMP	QTY	DESCRIPTION
1	1	WIDE FLANGE BEAM BASE WITH REMOVABLE FOUR POINT LIFTING PLATES
2	16	VIBRATION ISOLATORS
3	1	14 GA ENCLOSURE 142.00W x 104.00H x 516.00L
4	4	DOORS WITH THREE POINT LATCH, INSIDE OPERATORS AND PADLOCKING PROVISIONS
5	1	AIR INTAKE SILENCER
6	1	MOTORIZED AIR INTAKE LOUVER
7	1	GRAVITY AIR DISCHARGE LOUVER
8	1	AIR DISCHARGE SILENCER
9	1	INTERIOR - SOUND INSULATION
10	1	CONTROL PANEL
11	1	FUEL COOLER
12	1	FUEL/WATER SEPARATORS
13	1	LUBE OIL HEATER WITH THERMOSTAT
14	4	BATTERY RACKS AND CABLES
15	8	8-D BATTERIES
16	1	BATTERY CHARGER
17	2	MUFFLER
18	1	S.S. EXHAUST FLEX
19	4	MUFFLER MOUNTING BRACKETS
20	1	EXHAUST ROOF BRESS COLLAR
21	1	EXHAUST ELBOW AND RAIN CAP
22	1	OIL AND WATER DISPOSAL GROUP
23	1	LOW WATER LEVEL ALARM SWITCH
24	1	LOW OIL LEVEL ALARM SWITCH
25	1	100AMP, 480V, SINGLE PHASE PANEL BOARD
26	1	50AMP, 120/208V, SINGLE PHASE PANEL BOARD
27	6	INTERIOR FLUORESCENT LIGHTS
28	2	3-WAY WALL SWITCH
29	2	DUPLEX RECEPTACLES
30	1	NEUTRAL GROUNDING RESISTOR
31	2	GROUNDING LUG
32	2	24VDC INTERIOR LIGHTS WITH WALL SWITCH
33	1	400 GALLON DOUBLE WALL FUEL TANK WITH LOW AND HIGH FUEL ALARM SWITCHS
34	1	DRAINABLE FUMES COLLECTION POT WITH VALVE AND VENTED THROUGH ROOF
35	1	FUEL TRANSFER PUMP FLOAT VALVE







NOTES:
- CATERPILLAR 3516 PA1462 ENGINE SHOWN
- BAYLOR GA462NT-351 TVO BEARING GENERATOR SHOWN
- JEA ECO60F18 60 SQ FT RADIATOR SHOWN
- MAXIM 16.00 MSI MUFFLER SHOWN N = 63.00
- ACE 324-H VIBRATION ISOLATOR SHOWN

RECOMMEND MINIMUM OF 60.00 BETWEEN ENCLOSURE AND ANY OTHER STRUCTURE

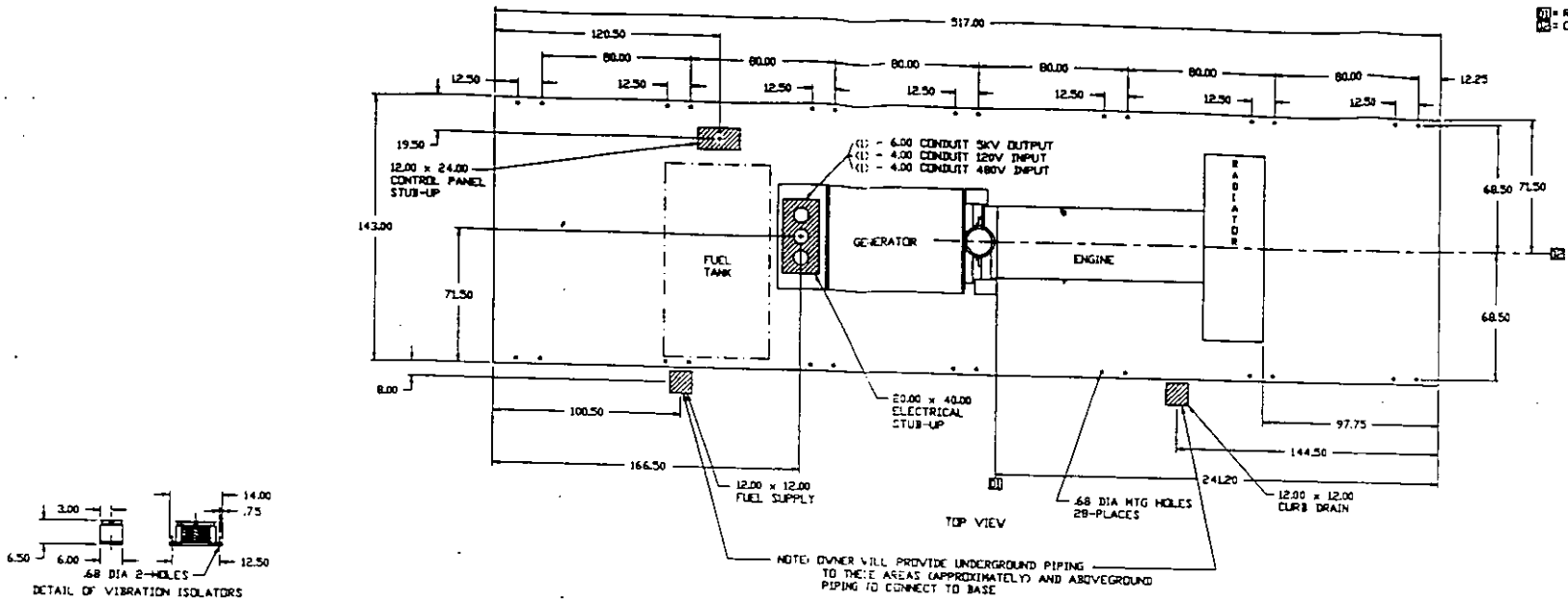
OWNER WILL PROVIDE ACCESS PLATFORM AND STAIRS ON EACH SIDE OF UNIT
ALL WIRING AND CONDUIT INTERNAL TO ENCLOSURE BY CONTRACTOR
CONTRACTOR TO PROVIDE CABLE FROM RESISTOR TO GENERATOR NEUTRAL TERMINALS

APPROX DRY WEIGHT = 80,000 lbs
W/ WET BATTERIES WET AND RACKS = 650 lbs
CONTROL PANEL WEIGHT = 300 lbs

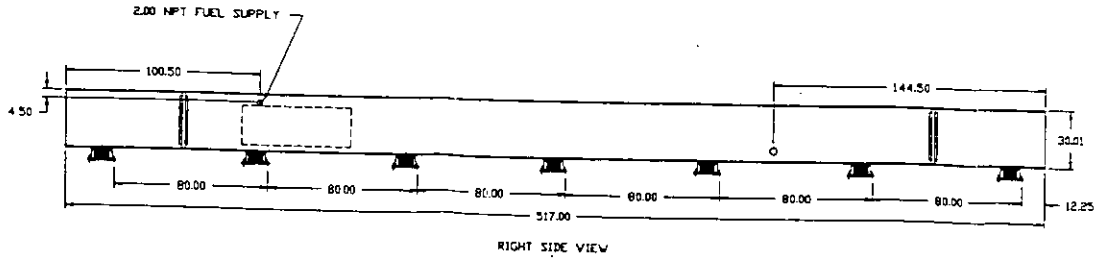
ALL DIMENSIONS IN INCHES
DO NOT SCALE DRAWING

BASE AND ENCLOSURE FOR A CATERPILLAR 3516

Childersburg Metal Co



DETAIL OF VIBRATION ISOLATORS



RIGHT SIDE VIEW

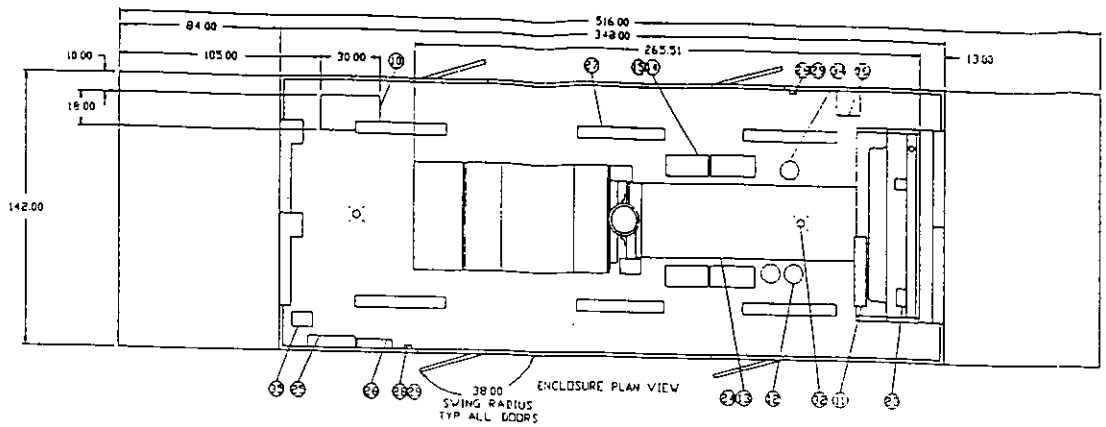
ALL DIMENSIONS IN INCHES
DO NOT SCALE DRAWING

MOUNTING AND STUB-UP LAYOUT

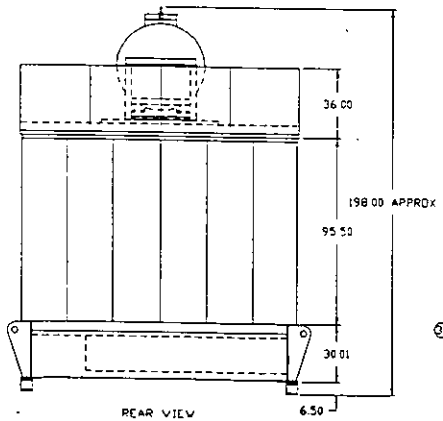
Chillicothe Metal Co.

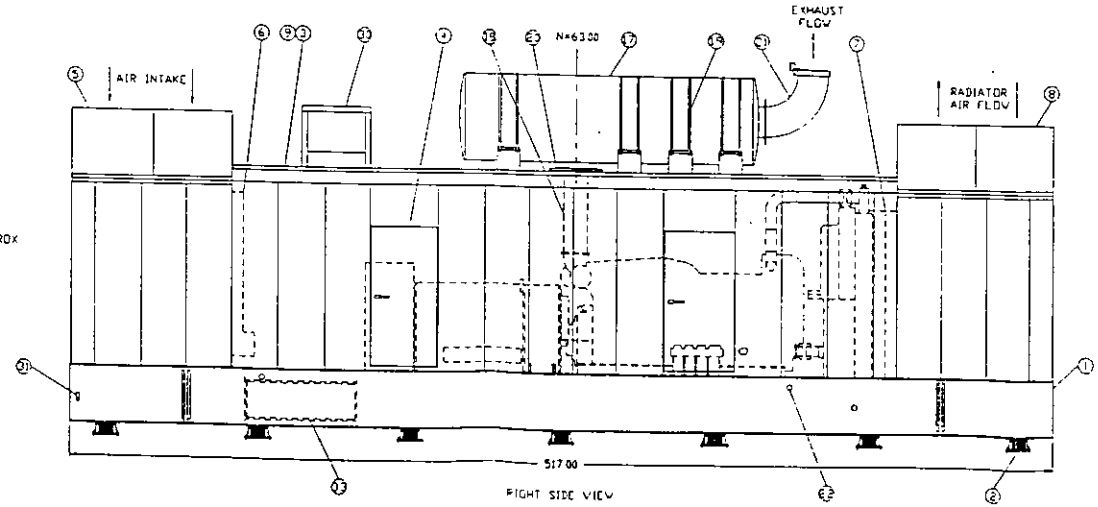
DRAWING NUMBER SK10836-1

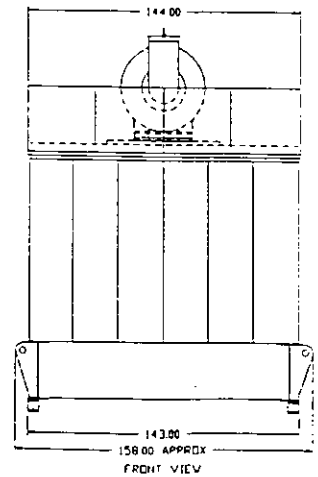
90H830



COMP	QTY	DESCRIPTION
1	1	WIDE FLANGE BEAM BASE WITH REMOVABLE FOUR POINT LIFTING PLATES
2	24	VIBRATION ISOLATORS
3	1	14 GA ENCLOSURE 142.00W x 104.00H x 516.00L
4	4	DOORS WITH THREE POINT LATCH, INSIDE OPERATORS AND PADLOCKING PROVISIONS
5	1	AIR INTAKE SILENCER
6	1	MOTORIZED AIR INTAKE LOUVER
7	1	GRAVITY AIR DISCHARGE LOUVER
8	1	AIR DISCHARGE SILENCER
9	1	INTERIOR - SOUND INSULATION
10	1	CONTROL PANEL
11	1	FUEL COOLER
12	1	FUEL/WATER SEPARATORS
13	1	LUBE OIL HEATER WITH THERMOSTAT
14	4	BATTERY RACKS AND CABLES
15	4	8-D BATTERIES
16	1	BATTERY CHARGER
17	1	MUFFLER
18	1	S.S. EXHAUST FLEX
19	4	MUFFLER MOUNTING BRACKETS
20	1	EXHAUST ROOF DRESS COLLAR
21	1	EXHAUST ELBOW AND RAIN CAP
22	1	OIL AND WATER DISPOSAL GROUP
23	1	LOW WATER LEVEL ALARM SWITCH
24	1	LOW OIL LEVEL ALARM SWITCH
25	1	100AMP, 480V, SINGLE PHASE PANEL BOARD
26	1	50AMP, 120/208V, SINGLE PHASE PANEL BOARD
27	6	INTERIOR FLUORESCENT LIGHTS
28	2	3-WAY WALL SWITCH
29	2	DUPLEX RECEPTACLES
30	1	NEUTRAL GROUNDING RESISTOR
31	2	GROUNDING LUG
32	2	24VDC INTERIOR LIGHTS WITH WALL SWITCH
33	1	400 GALLON DOUBLE WALL FUEL TANK WITH LOW AND HIGH FUEL ALARM SWITCHS
34	1	DRAINABLE FUMES COLLECTION POT WITH VALVE AND VENTED THROUGH ROOF
35	1	FUEL TRANSFER PUMP FLOAT VALVE







NOTES:
- CATERPILLAR 3516 PA1462 ENGINE SHOWN
- BAYLOR G4462NT-351 TWO BEARING GENERATOR SHOWN
- HEA EC060F16 60 SQ FT RADIATOR SHOWN
- MAXIM 16.00 HSI MUFFLER SHOWN N = 63.00
- ACE 124-H VIBRATION ISOLATOR SHOWN

RECOMMEND MINIMUM OF 60.00 BETWEEN ENCLOSURE AND ANY OTHER STRUCTURE

OWNER WILL PROVIDE ACCESS PLATFORM AND STAIRS ON EACH SIDE OF UNIT
ALL WIRING AND CONDUIT INTERNAL TO ENCLOSURE BY CONTRACTOR
CONTRACTOR TO PROVIDE CABLE FROM RESISTOR TO GENERATOR NEUTRAL TERMINALS

APPROX DRY WEIGHT = 70,000 lbs
WET AND BATTERIES WET AND RACKS = 650 lbs
CONTROL PANEL WEIGHT = 300 lbs

ALL DIMENSIONS IN INCHES
DO NOT SCALE DRAWING

BASE AND ENCLOSURE FOR A CATERPILLAR 3516

Chillicothe Metal Co.

DRAWING NUMBER 90H830

Request 9. Please provide the calculations and supporting document for the emissions listed in Table 2-5, page 2-8, for beryllium, lead, mercury, and inorganic arsenic.

Response 9. Table 2-5 of the PSD application contains total maximum annual emissions from four combustion turbines/heat recovery steam generators. EPA assigns emissions factors for lead, beryllium, mercury, and inorganic arsenic, for the firing of fuel oil but not for natural gas. These pollutants are contained in the fuel oil and are considered trace elements. Emission factors for each were obtained from the EPA document, "Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources." For more information on this document, contact John Glunn, Air Toxics Coordinator, FDER. Signed and sealed emission calculations for each pollutant are attached, along with copies of the cover and relevant pages of the referenced document.

EBASCO SERVICES INCORPORATED

CALCULATION COVER SHEET

SHEET 1 OF 8

OFS NO. FPC 2563,544 DEPT. NO. 0751

CLIENT Florida Power Corporation

PROJECT Polk County Site

SUBJECT Beryllium, Arsenic, Lead and Mercury Emission Estimates

CALCULATION NO. 920918DJG02

Additional calculations requested by FDER (ICL-Item 9)

Daniel J Graziani
9-18-92

CONTAINS ASSUMPTIONS WHICH REQUIRE CONFIRMATION ☐ YES ☒ NO

ASSUMPTIONS CONFIRMED ON _____ BY _____

PRELIMINARY ☐ FINAL ☒ SUPERSEDES CALC NO. NA

REV. NO.	SH. NOS.	CALCULATIONS BY		CHECKED BY		OPTIONAL REVIEWED OR APPROVED	
		NAME	DATE	NAME	DATE	NAME	DA
		D. Graziani	9-18-92	K. Masters	9/23/92		

511/11-85

EBASCO SERVICES INCORPORATED

BY D. Graziani DATE 9.18.92 SHEET 1 OF 1
CHKD. BY KM DATE 9/22/92 OFS NO. EPC 2563.544 DEPT. NO. 0751
CLIENT Florida Power Corporation
PROJECT Polk County Site
SUBJECT Beryllium, Arsenic, Lead and Mercury Emission Estimates

Assumptions: All contaminants are considered trace metals and are contained in the fuel oil. Allowed four (4) combustion turbines and 500 hours per year of fuel oil usage

Specifications:

Maximum Heat Input Rate: 1799.8 mm Btu/hr, Reference No. 2
Hours of Operation: 500 - requested
Number of Combustion Turbines: 4 - requested

Emission Factors:

Beryllium:	2.5×10^{-6} lb/mm Btu	Reference No. 1, pg 4-159
Arsenic:	4.20×10^{-6} lb/mm Btu	Reference No. 1, pg 4-158
Lead:	8.9×10^{-6} lb/mm Btu	Reference No. 1, pg 3-135
Mercury:	3.0×10^{-6} lb/mm Btu	Reference No. 1, pg 3-151

Hourly Emission Rates (lb/hr):

Beryllium: $(2.5 \times 10^{-6}$ lb/mm Btu$)(1799.8$ mm Btu/hr$)(4$ turbines$) = 0.0180$ lb/hr
Arsenic: $(4.20 \times 10^{-6}$ lb/mm Btu$)(1799.8$ mm Btu/hr$)(4$ turbines$) = 0.0302$ lb/hr
Lead: $(8.9 \times 10^{-6}$ lb/mm Btu$)(1799.8$ mm Btu/hr$)(4$ turbines$) = 0.0641$ lb/hr
Mercury: $(3.0 \times 10^{-6}$ lb/mm Btu$)(1799.8$ mm Btu/hr$)(4$ turbines$) = 0.0216$ lb/hr

Annual Emission Rates (TPY):

Beryllium: $(0.0180$ lb/hr$)(500$ hr/yr$)($Ton/2000 lb$) = 0.0045$ TPY
Arsenic: $(0.0302$ lb/hr$)(500$ hr/yr$)($Ton/2000 lb$) = 0.0076$ TPY
Lead: $(0.0641$ lb/hr$)(500$ hr/yr$)($Ton/2000 lb$) = 0.0160$ TPY
Mercury: $(0.0216$ lb/hr$)(500$ hr/yr$)($Ton/2000 lb$) = 0.0054$ TPY

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/2-88-006a
October 1988

Air

EPA

TOXIC AIR POLLUTANT EMISSION FACTORS— A COMPILATION FOR SELECTED AIR TOXIC COMPOUNDS AND SOURCES

POLLUTANT	CAS NUMBER	SIC CODE	INDUSTRIAL PROCESS	EMISSION SOURCE	SCC	EMISSION FACTOR	NOTES	REFERENCE
Mercury	7439976		Oil combustion	Residual oil-fired boiler, util/commerc/industr/residential	1	3.2 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Mercury	7439976		Oil combustion	Residual oil-fired boiler, util/commerc/industr/residential	1	3.2 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Mercury	7439976		Oil combustion	Residual oil-fired boiler, util/commerc/industr/residential	1	2.4 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Mercury	7439976		Oil combustion	Residual oil-fired boiler, util/commerc/industr/residential	1	0.83 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Mercury	7439976		Oil combustion	Distillate oil-fired boiler, util/commerc/industr/residential	1	3.0 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Mercury	7439976		Oil combustion	Distillate oil-fired boiler, util/commerc/industr/residential	1	3.0 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Mercury	7439976		Oil combustion	Distillate oil-fired boiler, util/commerc/industr/residential	1	2.25 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Mercury	7439976		Oil combustion	Distillate oil-fired boiler, util/commerc/industr/residential	1	0.78 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Mercury	7439976		Coal combustion	Bituminous coal-fired boiler, util/commerc/industr	1	16 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Mercury	7439976		Coal combustion	Bituminous coal-fired boiler, util/commerc/industr	1	16 lb/10E12 Btu	Controlled by multicyclone, based on engineering judgement	36
Mercury	7439976		Coal combustion	Bituminous coal-fired boiler, util/commerc/industr	1	8-16 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Mercury	7439976		Coal combustion	Bituminous coal-fired boiler, util/commerc/industr	1	0.96-7.4 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Mercury	7439976		Coal combustion	Lignite coal-fired boilers, util/commerc/industr	1	21 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Mercury	7439976		Coal combustion	Lignite coal-fired boilers,	1	21 lb/10E12 Btu	Controlled by multiclone, based on	36

POLLUTANT	CAS NUMBER	SIC CODE	INDUSTRIAL PROCESS	EMISSION SOURCE	SCC	EMISSION FACTOR	NOTES	REFERENCE
Hydroxy-2-phenyl propane		2865	Acetone/phenol manufacture from cumene	Cleavage section vents (combined)	30120211	3.4 x 10E-6 g/kg phenol	Controlled (unspecified), based on test data, 1977 data, average factors	125
Isobutane	75285	2895	Carbon black manufacture - oil furnace	Main process vent	30100504	0.20 lb/ton carbon black produced	Based on test data	97
Isobutyraldehyde	78842		Wood combustion, residential	Woodstove		1.5 g/kg wood burned	Uncontrolled, average emission factor based on source tests	58
Isobutyraldehyde	78842		Wood combustion, residential	Fireplace		1.4 g/kg wood burned	Uncontrolled, average emission factor based on source tests	58
Isopentanal	590863	2865	Acetone/phenol manufacture from cumene	Cleavage section vents (combined)	30120211	8.5 x 10E-7 g/kg phenol	Controlled (unspecified), based on test data, 1977 data, average factors	125
Lead	7439921		Paved roads	Entire source		0.065 g/vehicle mile	Based on field measurements for 1975-1976	122
Lead	7439921		Paved roads	Dust reentrainment		0.03 g/vehicle mile	Calculated based on data available for 1975-1976	122
Lead	7439921		Paved roads	Vehicle exhaust		0.002 g/vehicle mile	Projected emission factor for 1990, calculated based on composite vehicle operation	122
Lead	7439921		Oil combustion	Industrial, commercial, and residential boilers	1	8.9 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement, assumed use distillate oil	36
Lead	7439921		Oil combustion	Utility boilers	101004	28 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement, assumed use residual oil	36
Lead	7439921	4911	Coal combustion, residential	Residential boilers		510.0 lb/10E12 Btu	Uncontrolled, assumed use anthracite coal, calculated based on engineering judgement	36
Lead	7439921	4911	Coal combustion	Utility boilers	101002	507.4 lb/10E12 Btu	Uncontrolled, assumed use bituminous coal, calculated based on engineering judgement	36
Lead	7439921	4911	Coal combustion	Utility boilers	101002	25.37 lb/10E12 Btu	Controlled, assumed use bituminous coal, calculated based on engineering judgement	36

Reference 1
92091BDJE02

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al						
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	352.8 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	50.4 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	170 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	86.7 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	47.6 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	6.8 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	19 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	4.2 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	2.06 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	0.50 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	0.42 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti	1	Arsenic	7440382	9.31 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al					judgement	
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	2.28 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	1.90 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	4.2 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	2.5 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	1.58 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.35 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.15 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	2.65 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.59 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.25 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	15.7 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti	1	Cadmium	7440439	10.5 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36

Reference 1
9209150362

Reference 2
9209180J602

ESTIMATED PERFORMANCE - PG7221(FA)

LOAD CONDITION			BASE	80%	60%	40%	20%
AMBIENT TEMP.		- Deg F.	40	40	40	40	40
AMBIENT RELATIVE HUMID		- %	70	70	70	70	70
OUTPUT		- kW	178200.	143200.	106900.	70500.	35800.
HEAT RATE (LHV)		- Btu/kWh	10100.	10860.	12270.	14580.	18880.
HEAT CONS. (LHV)	X10-6	- Btu/h	1799.8	1555.2	1311.7	1027.9	675.9
EXHAUST FLOW	X10-3	- lb/h	3652.0	3028.0	2551.0	2152.0	2027.0
EXHAUST TEMP		- Deg F.	1071.	1142.	1200.	1200.	1027.
EXHAUST HEAT	X10-6	- Btu/h	997.5	900.1	809.4	684.5	527.0
WATER FLOW		- lb/h	129530.	109860.	88920.	63480.	0.
NOX		- ppmvd @ 15% 02	42.	42.	42.	42.	240.
NOX AS NO2		- lb/h	318.	273.	228.	177.	660.
CO		- ppmvd	30.	30.	50.	80.	*
CO		- lb/h	96.	79.	112.	152.	*
UHC		- ppmvw	7.	10.	20.	40.	*
UHC		- lb/h	15.	17.	29.	51.	*
SO2		- ppmvw	11.	12.	12.	11.	8.
SO2		- lb/h	92.	80.	67.	53.	35.
SO3		- ppmvw	1.	1.	1.	1.	0.
SO3		- lb/h	6.	5.	5.	3.	2.
SULFUR MIST		- lb/h	10.	8.	7.	6.	4.
PART		- lb/h	17.0	17.0	17.0	17.0	17.0

EXHAUST ANALYSIS % VOL.

ARGON	0.87	0.86	0.86	0.87	0.92
NITROGEN	71.09	70.92	71.10	71.91	76.13
OXYGEN	10.93	10.61	10.72	11.56	14.96
CARBON DIOXIDE	5.31	5.49	5.45	5.04	3.57
WATER	11.81	12.13	11.88	10.62	4.42

SITE CONDITIONS
****

ELEVATION	- ft.	163
SITE PRESSURE	- psia	14.62
INLET LOSS	- in. Water	3.5
EXHAUST LOSS	- in. Water	12
RELATIVE HUMIDITY	- %	70
FUEL TYPE	-	DISTILLATE
FUEL LHV	- Btu/lb	18550
APPLICATION	-	3175 HYDROGEN COOLED GENERATOR
COMBUSTION SYSTEM	-	DRY LOW NOX

EMISSION INFORMATION BASED ON GE RECOMMENDED MEASUREMENT METHODS.
NOx EMISSIONS ARE CORRECTED TO 15% 02 WITHOUT HEAT RATE CORRECTION AND ARE NOT CORRECTED TO ISO REFERENCE CONDITIONS PER 40CFR 60.335(a)(1)(i).
NOx LEVELS SHOWN WILL BE CONTROLLED BY ALGORITHMS WITHIN THE SPEEDTRONIC CONTROL SYSTEM.

DISTILLATE FUEL IS ASSUMED TO HAVE .015% FUEL BOUND NITROGEN, OR LESS.
FBN AMOUNTS GREATER THAN .015% WILL ADD TO THE REPORTED NOx VALUE.
SULFUR EMISSIONS BASED ON .05 WT% SULFUR CONTENT IN THE FUEL.

* DATA CURRENTLY NOT AVAILABLE

IPS-8585
JAH 7-22-92

Request 10. What is the efficiency of the combustion turbine? Calculate Y (refer to NSPS 40 CFR 60, Subpart GG) in kilojoules per watt hour, showing all the calculations.

Response 10. Using the heat consumption and output given in Attachment CCU-1 for base load operation at 72° F on natural gas, the efficiency can be calculated as follows:

$$Y = \frac{Heat\ Consumption}{Output}$$

$$Y = \frac{1{,}572.5 \times 10^{6}\ Btu/hr}{165{,}000 \times 10^{3}\ W} \times \frac{1.0548\ kJ}{Btu} = 10.0526\ \frac{kJ}{W\,hr}$$

Request 11. Submit manufacturer's name, model number, generator name plate rating (Gross MW), maximum steam production rate for the Heat Recovery Steam Generator (HRSG).

Response 11. The HRSG will be a custom engineered piece of equipment designed to extract the heat energy from the CT exhaust and supply steam to the plant steam turbines. There will be no significant difference in HRSG design between the one-on-one and the two-on-one configurations. The particular manufacturer for the HRSG has not yet been determined. A typical HRSG is described in the attachment to this response.

Request 12. What is the maximum and nominal power (MW) output of the steam turbine generator? What is the steam input to this turbine?

Response 12. The nominal output of the steam turbine generator (72°F, natural gas) in a two-on-one cycle is 166 MW with 800,000 lb/hour steam flow through the high pressure turbine, 908,000 lb/hour through the intermediate pressure turbine, and 1,007,000 lb/hour through the low pressure turbine. The maximum output of the steam turbine generator (40°F, natural gas) in a two-on-one cycle is approximately 173 MW with approximately 2 percent higher steam flows.

The nominal output of the steam turbine generator (72°F, natural gas) in a one-on-one cycle is 82 MW with 404,000 lb/hour steam flow through the high pressure turbine, 442,000 lb/hour through the intermediate pressure turbine, and 507,000 lb/hour through the low pressure turbine. The maximum output of the steam turbine generator (40°F, natural gas) in a one-on-one cycle is approximately 85 MW with approximately 2 percent higher steam flows.

Request 13. Please submit the manufacturer's design specifications for the proposed auxiliary boiler. Based on the information submitted, the application will be processed on the assumption that the Nebraska boiler will be selected. If another boiler is installed, the application would have to be revised to include all required data for the boiler selected.

Response 13. The manufacturer's design specifications are not yet available for the auxiliary boiler since the equipment has not been procured. Catalog information for a typical 150 MMBtu/hr auxiliary boiler is included. The auxiliary boiler specification will be written based on the emission criteria stated in the PSD Permit Application. The specific auxiliary boiler manufacturer's information will be provided after the equipment is procured. FPC recognizes that the application would need to be revised if a different boiler is selected which has higher pollutant emission rates than the Nebraska boiler. FPC asks that the application be reviewed based on the information submitted.

Request 14. What is the estimated annual throughput and the type of air pollution control for the fuel oil storage tanks? What are the estimated emissions?

Response 14. The requested information is provided on the attached calculation sheets. Other than submerged fill, no additional pollution control is required. An FDER permit application for the fuel oil storage tank is also attached.

Florida Power
CORPORATION

Richard W. Neiser
Senior Vice President
Legal and
Governmental Affairs

May 29, 1992

TO WHOM IT MAY CONCERN

Subject: Letter of Authorization

Please be advised that Patricia K. Blizzard, Director, Environmental Services Department, and Mr. W. Jeffrey Pardue, Manager of Environmental Programs, are authorized to represent Florida Power Corporation in matters relating to necessary permits and reporting documentation required from regulatory authorities in the areas of air, water, power plant site certifications and transmission line certifications, or hazardous and solid materials issues.

Sincerely,

Richard W. Neiser

RWN bb

Florida Department of Environmental Regulation
Twin Towers Office Bldg • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form #
Effective Date
DER Application No.

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Electric Generating Station [x] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Florida Power Corporation COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Fuel Oil Storage Tank

SOURCE LOCATION: Street 7700 CR 555 City Barton

UTM: East _____ North _____

Latitude 27 ° 47 ' 13 "N Longitude 81 ° 52 ' 07 "W

APPLICANT NAME AND TITLE: R.W. Neiser, Sr Vice President, Legal & Governmental Affairs

APPLICANT ADDRESS: 3201 34th Street South, St Petersburg, FL 33733

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida Power Corporation

I certify that the statements made in this application for a air construction permit are true, correct and complete to the best of my knowledge and belief. Furthe I agree to maintain and operate the pollution control source and pollution contr facilities in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: Patricia Hagood, Director, for
R.W. Neiser, Senior Vice President
Legal & Governmental Affairs
Name and Title (Please Type)

Date: 10/1/92 Telephone No. (813) 866-5784

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project ha been designed/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in t permit application. There is reasonable assurance, in my professional judgment, th

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

Northwest District: 160 Governmental Center, Pensacola, Florida 32501-5794, 904-436-8300
Northeast District: 3426 Bills Rd, Jacksonville, Florida 32207, 904-798-4200
Central District: 3319 Maguire Blvd, Suite 232, Orlando, Florida 32803-3767, 407-894-7555
Southwest District: 4520 Oak Fair Blvd, Tampa, Florida 33610-7347, 813-623-5561
South District: 2269 Bay St, Fort Myers, Florida 33901-2896, 813-332-2897
Southeast District: 1900 S. Congress Ave., Suite A, West Palm Beach, Florida 33406, 407-964-9668

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Darrel J Graziani

Darrel J Graziani
Name (Please Type)

Ebasco Environmental
Company Name (Please Type)

759 South Federal Highway
Stuart, Florida 34994
Mailing Address (Please Type)

Florida Registration No. 44685 Date: 9/17/92 Telephone No. (407 225-8712

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

For the construction of a fuel oil storage tank with a maximum storage capacity of 97,570 barrels. VOC emissions will be controlled by use of submerged filling and draining.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction April 1995 Completion of Construction November 1998

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Not applicable - standard design practice

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr_____; if seasonal, describe: Tank will store oil year round.

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant?	No
a. If yes, has "offset" been applied?	NA
b. If yes, has "Lowest Achievable Emission Rate" been applied?	NA
c. If yes, list non-attainment pollutants.	
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.	Yes (1)
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII.	Yes (1)
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?	Yes (2)
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?	No
H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source?	No

a. If yes, for what pollutants?_____

b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Low Sulfur fuel oil	VOC	100	NA	(3)

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (~~lbs/hr~~): 28,685,524 gallons/year

2. Product Weight (lbs/hr): NA

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			~~lbs/yr~~ lbs/hr	T/yr	
VOC	0.40	1.75	17-2.620	0.40	0.40	1.75	(3)

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

_____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

As described in the Site Certification Application submitted to the FDER on August 24, 1992

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: _____ ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

Water Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
   Attached
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. Attached, AP42
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   Attached AP42 Section 4.3
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) NA
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). NA
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. Attached
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
   Attached to PSD application
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   Attached to PSD application

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. NA-Part of the Site Certification application.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit. NA

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[X] Yes [ ] No

Contaminant	Rate or Concentration
Volatile Organic Compounds	Not Applicable - Subpart kb specifies only a recordkeeping requirement for this type of tank

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[X] Yes [ ] No

Contaminant	Rate or Concentration
Volatile Organic Compounds	Submerged Fill and Drainage

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Volatile Organic Compounds	1.75 TPY

D. Describe the existing control and treatment technology (if any). NA

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters NA

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). NA

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

Previeously Submitted

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ ( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ (month day year) to _____/_____/_____ (month day year)

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

Notes

(1) The fuel oil storage tank is subject to both PSD and BACT requirements based on total allowable emissions of volatile organic compounds from the entire Polk County Site.

(2) The applicable requirements of NSPS Subpart Kb specify only recordkeeping. Specifically, a diagram of the dimensions of the tank and calculations showing the estimated tank capacity is all that is required. This record is to be finalized upon completion of construction.

(3) A review of the EPA BACT/LAER clearinghouse database identified two (2) recent BACT determinations for fuel oil storage tanks. Both determinations specify submerged filling and draining which is quite standard for fuel oil storage tanks in attainment and nonattainment areas.

BACT/LAER Determinations

File No.	Contact	Control Technology
AL-0057	Daniel Price (205) 271-7861	Submerged filling
OH-0100B	Dale Krygeilski (419) 693-0350	Submerged filling

These determinations were found under the Source Category 5.9. Additional determinations for tanks containing gasoline, crude oil and other organic solvents were listed in the search. These determinations were rejected due to the higher emission limits associated with the products. The database was accessed on September 18, 1992 and information retrieved which had been entered on or after June 1, 1986.

Based on the review it is requested that the Department deem submerged filling and draining as BACT for fuel oil storage tanks.

United States
Environmental Protection
Agency

Air

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

AP-42
Fourth Edition
September 1985

EPA

COMPILATION OF AIR POLLUTANT EMISSION FACTORS

Volume I: Stationary Point And Area Sources

FOURTH EDITION

4.3 STORAGE OF ORGANIC LIQUIDS

4.3.1 Process Description

Storage vessels containing organic liquids can be found in many industries, including (1) petroleum producing and refining, (2) petrochemical and chemical manufacturing, (3) bulk storage and transfer operations, and (4) other industries consuming or producing organic liquids. Organic liquids in the petroleum industry, usually called petroleum liquids, generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry, usually called volatile organic liquids, are composed of pure chemicals or mixtures of chemicals with similar true vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols).

Five basic tank designs are used for organic liquid storage vessels, fixed roof, external floating roof, internal floating roof, variable vapor space, and pressure (low and high).

Fixed Roof Tanks - A typical fixed roof tank is shown in Figure 4.3-1. This type of tank consists of a cylindrical steel shell with a permanently affixed roof, which may vary in design from cone or dome shaped to flat.

Fixed roof tanks are commonly equipped with a pressure/vacuum vent that allows them to operate at a slight internal pressure or vacuum to prevent the release of vapors during very small changes in temperature, pressure or liquid level. Of current tank designs, the fixed roof tank is the least expensive to construct and is generally considered the minimum acceptable equipment for storage of organic liquids.

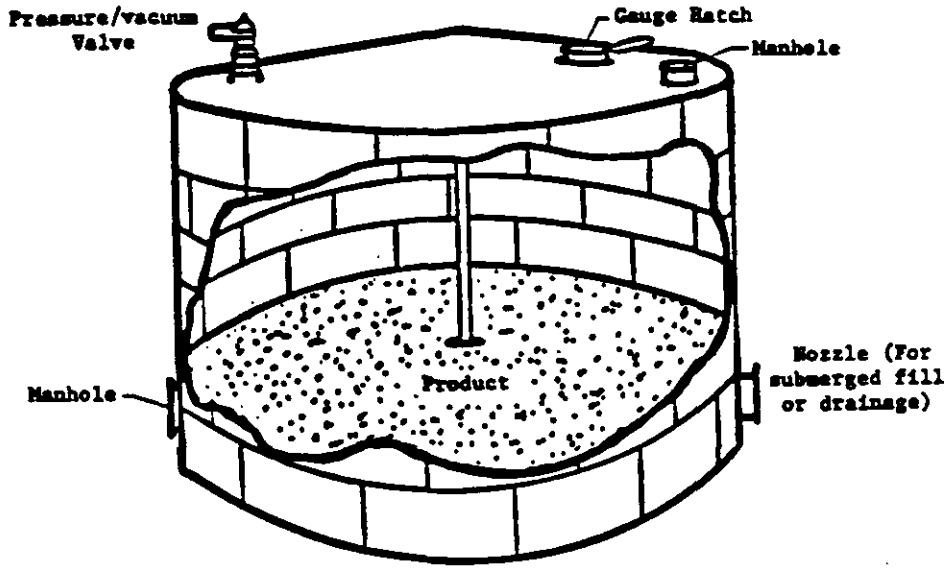


Figure 4.3-1. Typical fixed roof tank.[1]

External Floating Roof Tanks - A typical external floating roof tank is shown in Figure 4.3-2. This type of tank consists of a cylindrical steel shell equipped with a roof which floats on the surface of the stored liquid, rising and falling with the liquid level. The liquid surface is completely covered by the floating roof, except at the small annular space between the roof and the tank wall. A seal (or seal system) attached to the roof contacts the tank wall (with small gaps, in some cases) and covers the annular space. The seal slides against the tank wall as the roof is raised or lowered. The purpose of the floating roof and the seal (or seal system) is to reduce the evaporation loss of the stored liquid.

Internal Floating Roof Tanks - An internal floating roof tank has both a permanent fixed roof and a deck inside. The deck rises and falls with the liquid level and either floats directly on the liquid surface (contact deck) or rests on pontoons several inches above the liquid surface (non-contact deck). The terms "deck" and "floating roof" can be used interchangeably in reference to the structure floating on the liquid inside the tank. There are two basic types of internal floating roof tanks, tanks in which the fixed roof is supported by vertical columns within the tank, and tanks with a self-supporting fixed roof and no internal support columns. Fixed roof tanks that have been retrofitted to employ a floating deck are typically of the first type, while external floating roof tanks typically have a self-supporting roof when converted to an internal floating roof tank. Tanks initially constructed with both a fixed roof and a floating deck may be of either type.

The deck serves to restrict evaporation of the organic liquid stock. Evaporation losses from decks may come from deck fittings, nonwelded deck seams, and the annular space between the deck and tank wall. Typical contact deck and noncontact deck internal floating roof tanks are shown in

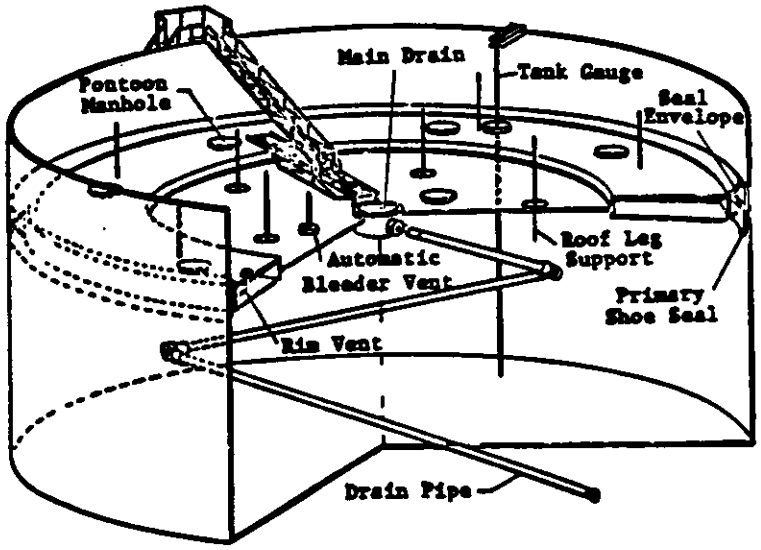


Figure 4.3-2. External floating roof tank.[1]

Figure 4.3-3. Contact decks can be aluminum sandwich panels with a honeycomb aluminum core floating in contact with the liquid, or pan steel decks floating in contact with the liquid, with or without pontoons. Typical noncontact decks have an aluminum deck or an aluminum grid framework supported above the liquid surface by tubular aluminum pontoons or other bouyant structures. Both types of deck incorporate rim seals, which slide against the tank wall as the deck moves up and down. In addition, these tanks are freely vented by circulation vents at the top of the fixed roof. The vents minimize the possibility of organic vapor accumulation in concentrations approaching the flammable range. An internal floating roof tank not freely vented is considered a pressure tank.

Pressure Tanks - There are two classes of pressure tanks in general use, low pressure (2.5 to 15 psig) and high pressure (higher than 15 psig). Pressure tanks generally are used for storage of organic liquids and gases with high vapor pressures and are found in many sizes and shapes, depending on the operating pressure of the tank. Pressure tanks are equipped with a pressure/vacuum vent that is set to prevent venting loss from boiling and breathing loss from daily temperature or barometric pressure changes. High pressure storage tanks can be operated so that virtually no evaporative or working losses occur. In low pressure tanks, working losses can occur with atmospheric venting of the tank during filling operations.

Variable Vapor Space Tanks - Variable vapor space tanks are equipped with expandable vapor reservoirs to accomodate vapor volume fluctuations attributable to temperature and barometric pressure changes. Although variable vapor space tanks are sometimes used independently, they are normally connected to the vapor spaces of one or more fixed roof tanks. The two most common types of variable vapor space tanks are lifter roof tanks and flexible diaphragm tanks.

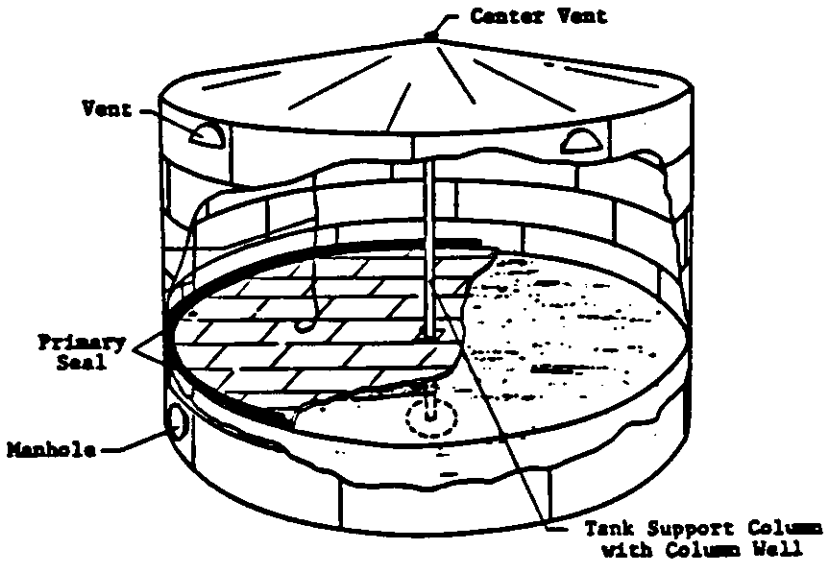
Lifter roof tanks have a telescoping roof that fits loosely around the outside of the main tank wall. The space between the roof and the wall is closed by either a wet seal, which is a trough filled with liquid, or a dry seal, which uses a flexible coated fabric.

Flexible diaphragm tanks use flexible membranes to provide expandable volume. They may be either separate gasholder units or integral units mounted atop fixed roof tanks.

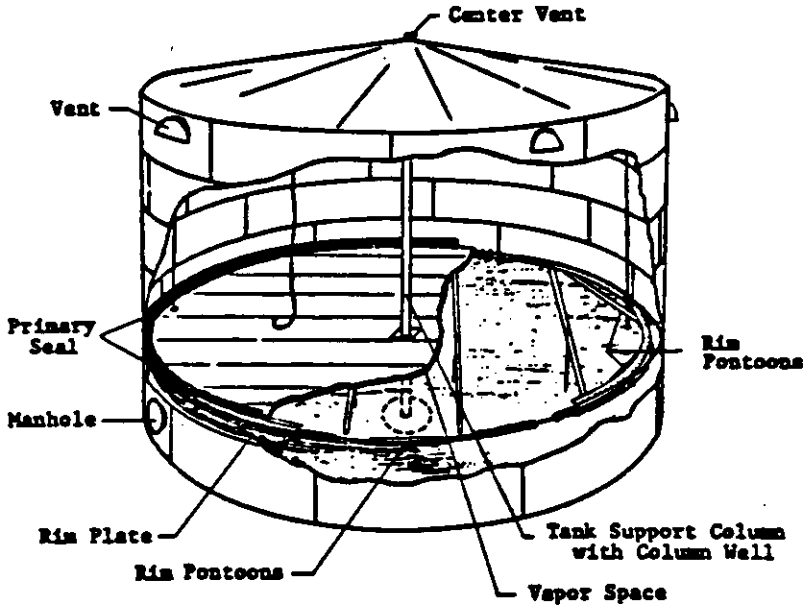
4.3.2 Emissions And Controls

Emission sources from organic liquids in storage depend upon the tank type. Fixed roof tank emission sources are breathing loss and working loss. External or internal floating roof tank emission sources are standing storage loss and withdrawal loss. Standing storage loss includes rim seal loss, deck fitting loss and deck seam loss. Pressure tanks and variable vapor space tanks are also emission sources.

Fixed Roof Tanks - Two significant types of emissions from fixed roof tanks are breathing loss and working loss. Breathing loss is the expulsion of vapor from a tank through vapor expansion and contraction, which are the results of changes in temperature and barometric pressure. This loss occurs without any liquid level change in the tank.



Contact Deck Type



Noncontact Deck Type

Figure 4.3-3. Internal floating roof tanks.[1]

The combined loss from filling and emptying is called working loss. Filling loss comes with an increase of the liquid level in the tank, when the pressure inside the tank exceeds the relief pressure and vapors are expelled from the tank. Emptying loss occurs when air drawn into the tank during liquid removal becomes saturated with organic vapor and expands, thus exceeding the capacity of the vapor space.

The following equations, provided to estimate emissions, are applicable to tanks with vertical cylindrical shells and fixed roofs. These tanks must be substantially liquid and vapor tight and must operate approximately at atmospheric pressure. Fixed roof tank breathing losses can be estimated from[2]:

$$L_B = 2.26 \times 10^{-2} M_V \left(\frac{P}{P_A - P} \right)^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P C K_C \qquad (1)$$

where:

L_B = fixed roof breathing loss (lb/yr)

M_V = molecular weight of vapor in storage tank (lb/lb mole), see Note 1

P_A = average atmospheric pressure at tank location (psia)

P = true vapor pressure at bulk liquid conditions (psia), see Note 2

D = tank diameter (ft)

H = average vapor space height, including roof volume correction (ft), see Note 3

ΔT = average ambient diurnal temperature change (°F)

F_P = paint factor (dimensionless), see Table 4.3-1

C = adjustment factor for small diameter tanks (dimensionless), see Figure 4.3-4

K_C = product factor (dimensionless), see Note 4

Notes: (1) The molecular weight of the vapor, M_V, can be determined by Table 4.3-2 for selected petroleum liquids and volatile organic liquids or by analysis of vapor samples. Where mixtures of organic liquids are stored in a tank, M_V can be estimated from the liquid composition. As an example of the latter calculation, consider a liquid known to be composed of components A and B with mole fractions in the liquid X_a and X_b, respectively. Given the vapor pressures of the pure

TABLE 4.3-1. PAINT FACTORS FOR FIXED ROOF TANKS[a]

Tank color		Paint factors (F_p)	
		Paint condition	
Roof	Shell	Good	Poor
White	White	1.00	1.15
Aluminum (specular)	White	1.04	1.18
White	Aluminum (specular)	1.16	1.24
Aluminum (specular)	Aluminum (specular)	1.20	1.29
White	Aluminum (diffuse)	1.30	1.38
Aluminum (diffuse)	Aluminum (diffuse)	1.39	1.46
White	Gray	1.30	1.38
Light gray	Light gray	1.33	1.44[b]
Medium gray	Medium gray	1.40	1.58[b]

[a]Reference 2.
[b]Estimated from the ratios of the seven preceding paint factors.

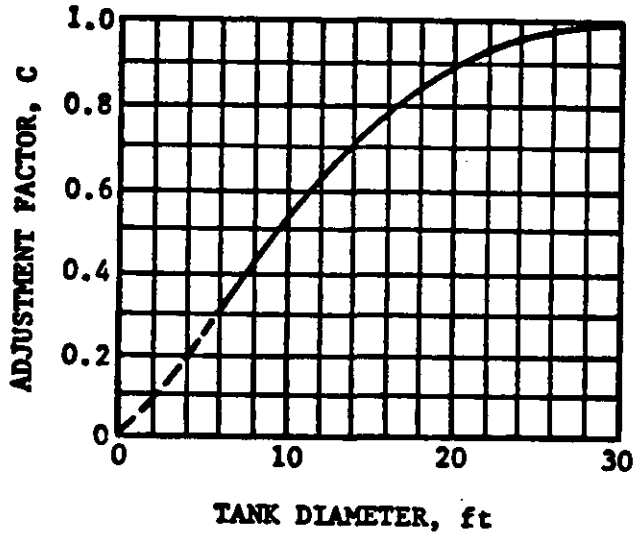


Figure 4.3-4. Adjustment factor (C) for small diameter tanks.[2]

TABLE 4.3-2. PHYSICAL PROPERTIES OF TYPICAL ORGANIC LIQUIDS[a]

Organic liquid[b]	Vapor molecular weight @ 60°F	Product density (d), lb/gal @ 60°F	Condensed vapor density (w), lb/gal @ 60°F	True vapor pressure in psia at: 40°F	50°F	60°F	70°F	80°F	90°F	100°F
Petroleum Liquids[c]										
Gasoline RVP 13	62	5.6	4.9	4.7	5.7	6.9	8.3	9.9	11.7	13.8
Gasoline RVP 10	66	5.6	5.1	3.4	4.2	5.2	6.2	7.4	8.8	10.5
Gasoline RVP 7	68	5.6	5.2	2.3	2.9	3.5	4.3	5.2	6.2	7.4
Crude oil RVP 5	50	7.1	4.5	1.8	2.3	2.8	3.4	4.0	4.8	5.7
Jet naphtha (JP-4)	80	6.4	5.4	0.8	1.0	1.3	1.6	1.9	2.4	2.7
Jet kerosene	130	7.0	6.1	0.0041	0.0060	0.0085	0.011	0.015	0.021	0.029
Distillate fuel no. 2	130	7.1	6.1	0.0031	0.0045	0.0074	0.0090	0.012	0.016	0.022
Residual oil no. 6	190	7.9	6.4	0.00002	0.00003	0.00004	0.00006	0.00009	0.00013	0.00019
Volatile Organic Liquids										
Acetone	58	6.6	6.6	1.7	2.2	2.9	3.7	4.7	5.9	7.3
Acrylonitrile	53	6.8	6.8	0.8	1.0	1.4	1.8	2.4	3.1	4.0
Benzene	78	7.4	7.4	0.6	0.9	1.2	1.5	2.0	2.6	3.3
Carbon disulfide	76	10.6	10.6	3.0	3.9	4.8	6.0	7.4	9.2	11.2
Carbon tetrachloride	154	13.4	13.4	0.8	1.1	1.4	1.8	2.3	3.0	3.8
Chloroform	119	12.5	12.5	1.5	1.9	2.5	3.2	4.1	5.2	6.3
Cyclohexane	84	6.5	6.5	0.7	0.9	1.2	1.6	2.1	2.6	3.2
1,2-Dichloroethane	99	10.5	10.5	0.6	0.8	1.0	1.4	1.7	2.2	2.8
Ethylacetate	88	7.6	7.6	0.6	0.8	1.1	1.5	1.9	2.5	3.2
Ethyl alcohol	46	6.6	6.6	0.2	0.4	0.6	0.9	1.2	1.7	2.3
Isopropyl alcohol	60	6.6	6.6	0.2	0.3	0.6	0.7	0.9	1.3	1.8
Methyl alcohol	32	6.6	6.6	0.7	1.0	1.4	2.0	2.6	3.5	4.5
Methylene chloride	85	11.1	11.1	3.1	4.3	5.4	6.8	8.7	10.3	13.3
Methylethyl ketone	72	6.7	6.7	0.7	0.9	1.2	1.5	2.1	2.7	3.3
Methylmethacrylate	100	7.9	7.9	0.1	0.2	0.3	0.6	0.8	1.1	1.4
1,1,1-Trichloroethane	133	11.2	11.2	0.9	1.2[3]	1.6	2.0	2.6	3.3	4.2
Trichloroethylene	131	12.3	12.3	0.5	0.7	0.9	1.2	1.5	2.0	2.0
Toluene	92	7.3	7.3	0.2	0.2	0.3	0.4	0.6	0.8	1.0
Vinylacetate	86	7.8	7.8	0.7	1.0	1.3	1.7	2.3	3.1	4.0

[a] References 3-4.
[b] For a more comprehensive listing of volatile organic liquids, see Reference 3.
[c] RVP = Reid vapor pressure in psia.

components, P_a and P_b, and the molecular weights of the pure components, M_a and M_b, M_V is calculated:

$$M_V = M_a \left(\frac{P_a X_a}{P_t} \right) + M_b \left(\frac{P_b X_b}{P_t} \right)$$

where: P_t, by Raoult's law, is:

$$P_t = P_a X_a + P_b X_b$$

(2) True vapor pressures for organic liquids can be determined from Figures 4.3-5 or 4.3-6, or Table 4.3-2. In order to use Figures 4.3-5 or 4.3-6, the stored liquid temperature, T_S, must be determined in degrees Fahrenheit. T_S is determined from Table 4.3-3, given the average annual ambient temperature, T_A, in degrees Fahrenheit. True vapor pressure is the equilibrium partial pressure exerted by a volatile organic liquid, as defined by ASTM-D-2879 or as obtained from standard reference texts. Reid vapor pressure is the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids, except liquified petroleum gases, as determined by ASTM-D-323.

(3) The vapor space in a cone roof is equal in volume to a cylinder, which has the same base diameter as the cone and is one third the height of the cone. If information is not available, assume H equals one half tank height.

(4) For crude oil, $K_C = 0.65$. For all other organic liquids, $K_C = 1.0$.

Fixed roof tank working losses can be estimated from[2]:

$$L_W = 2.40 \times 10^{-5} M_V P V N K_N K_C \qquad (2)$$

where:

L_W = fixed roof working loss (lb/year)

M_V = molecular weight of vapor in storage tank (lb/lb mole), see Note 1 to Equation 1

P = true vapor pressure at bulk liquid temperature (psia), see Note 2 to Equation 1

V = tank capacity (gal)

N = number of turnovers per year (dimensionless)

$$N = \frac{\text{Total throughput per year (gal)}}{\text{Tank capacity, V (gal)}}$$

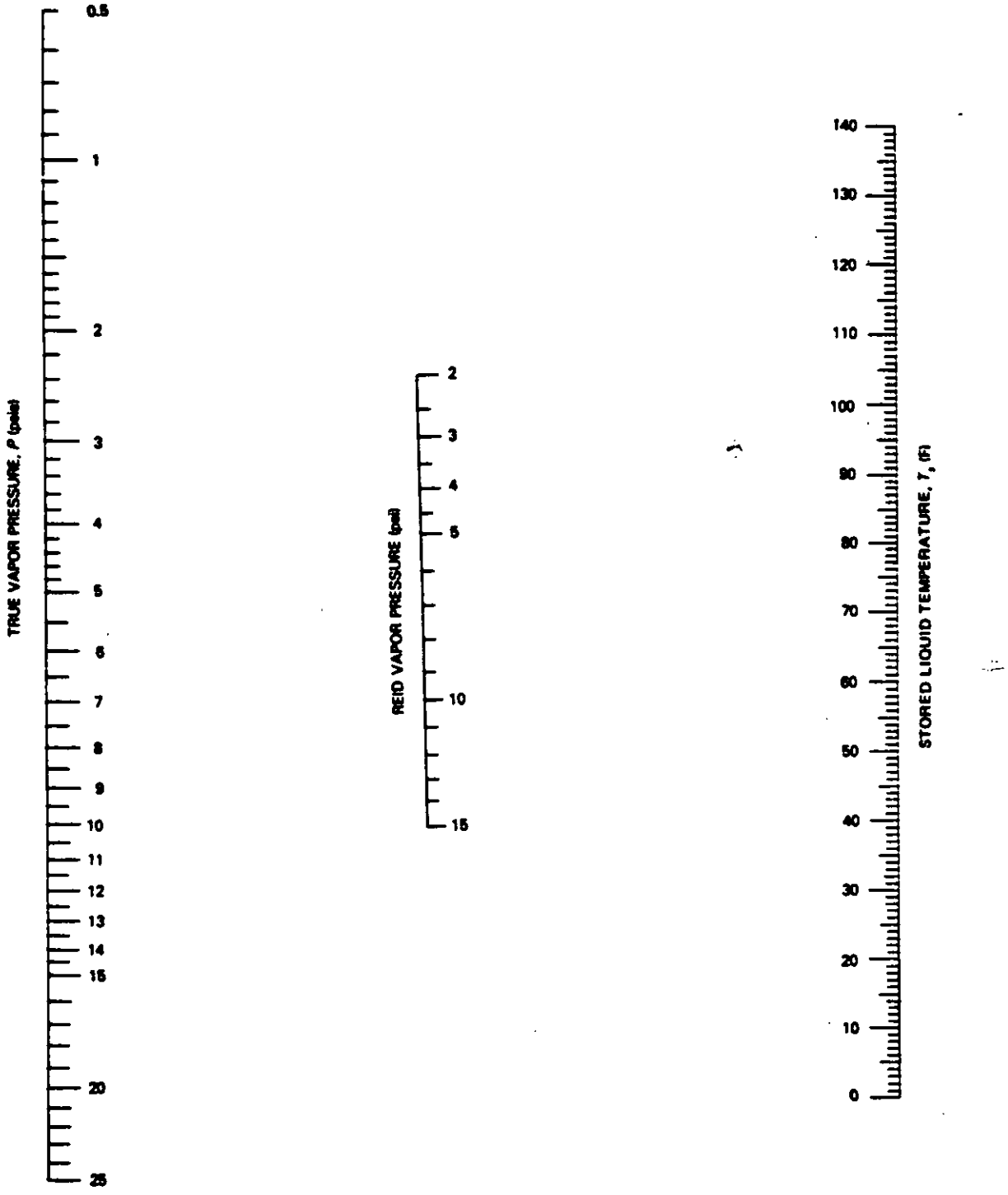
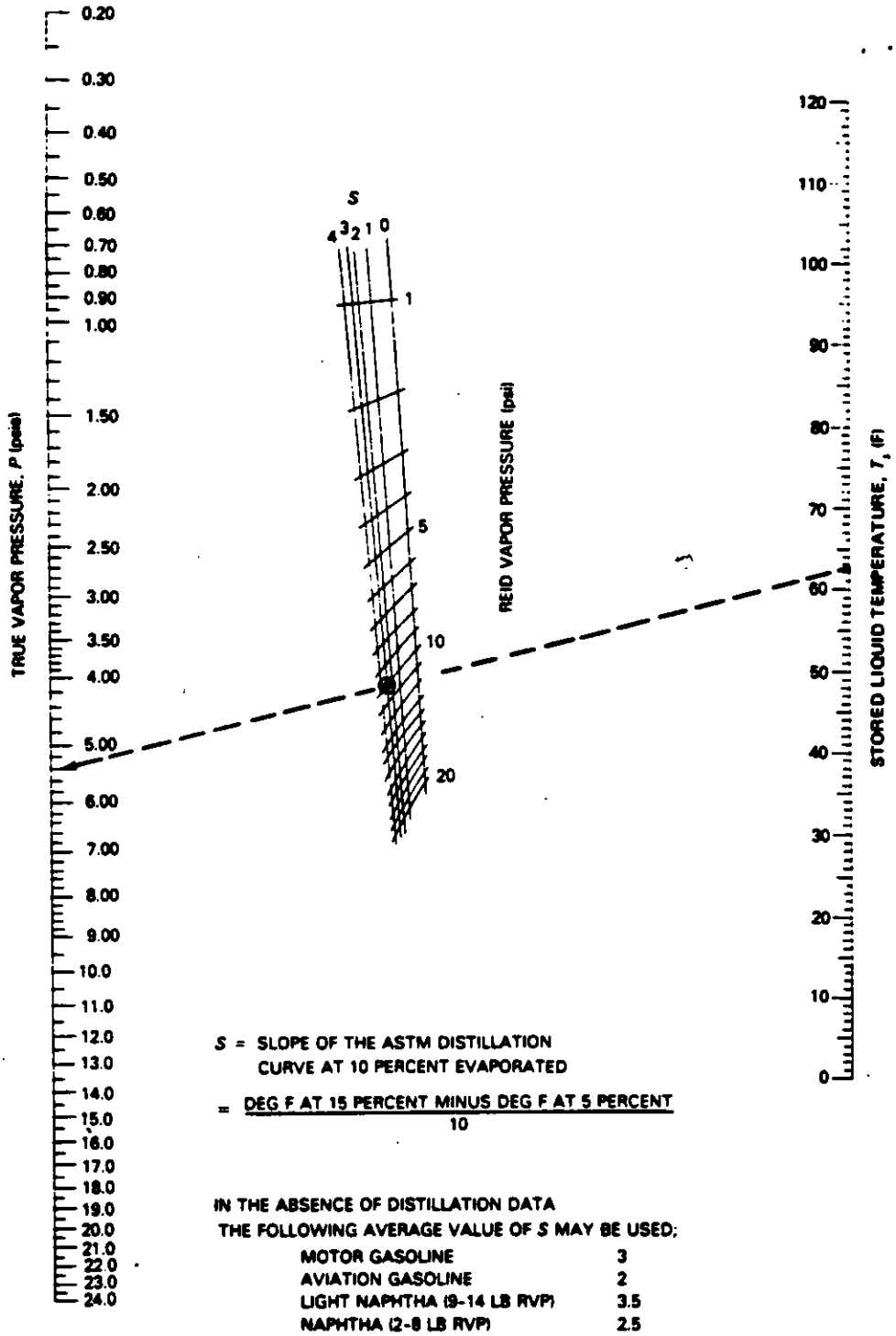


Figure 4.3-5. True vapor pressure (P) of crude oils (2-15 psi RVP).[6]



NOTE: Dashed line illustrates sample problem for RVP = 10 pounds per square inch, gasoline (S = 3), and T_s = 62.5 F.
SOURCE: Nomograph drawn from the data of the National Bureau of Standards.

Figure 4.3-6. True vapor presure (P) of refined petroleum liquids like gasoline and napththas (1-20 psi RVP).[6]

K_N = turnover factor (dimensionless), see Figure 4.3-7

K_C = product factor (dimensionless), see Note 1

Note: (1) For crude oil, K_C = 0.84. For all other organic liquids, K_C = 1.0.

TABLE 4.3-3. AVERAGE STORAGE TEMPERATURE (T_S) AS A FUNCTION OF TANK PAINT COLOR[a]

Tank color	Average storage temperature, T_S
White	T_A[b] + 0
Aluminum	T_A + 2.5
Gray	T_A + 3.5
Black	T_A + 5.0

[a]Reference 5.
[b]T_A is the average annual ambient temperature in degrees Fahrenheit.

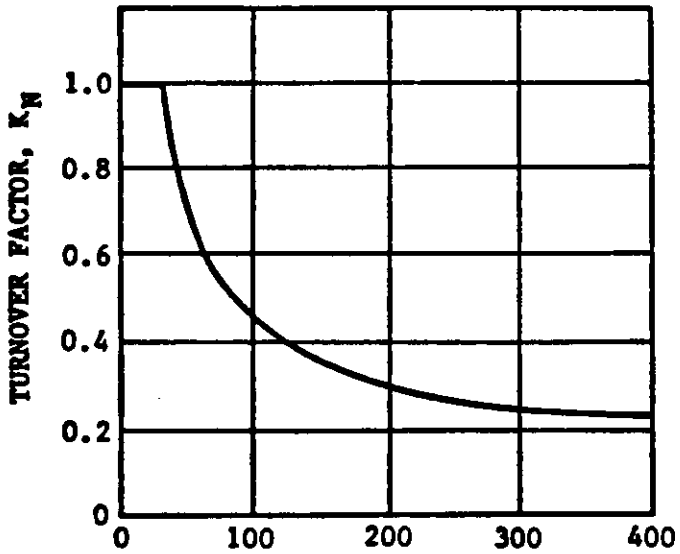


Figure 4.3-7. Turnover factor (K_N) for fixed roof tanks.

Several methods are used to control emissions from fixed roof tanks. Emissions from fixed roof tanks can be controlled by the installation of an internal floating roof and seals to minimize evaporation of the product being stored. The control efficiency of this method ranges from 60 to 99 percent, depending on the type of roof and seals installed and on the type of organic liquid stored.

The vapor recovery system collects emissions from storage vessels and converts them to liquid product. Several vapor recovery procedures may be used, including vapor/liquid absorption, vapor compression, vapor cooling, vapor/solid adsorption, or a combination of these. The overall control efficiencies of vapor recovery systems are as high as 90 to 98 percent, depending on the method used, the design of the unit, the composition of vapors recovered, and the mechanical condition of the system.

Another method of emission control on fixed roof tanks is thermal oxidation. In a typical thermal oxidation system, the air/vapor mixture is injected through a burner manifold into the combustion area of an incinerator. Control efficiencies for this system can range from 96 to 99 percent.

External And Internal Floating Roof Tanks - Total emissions from floating roof tanks are the sum of standing storage losses and withdrawal losses. Standing storage loss from internal floating roof tanks includes rim seal, deck fitting, and deck seam losses. Standing storage loss from external floating roof tanks, as discussed here, includes only rim seal loss, since deck fitting loss equations have not been developed. There is no deck seam loss, because the decks have welded sections.

Standing storage loss from external floating roof tanks, the major element of evaporative loss, results from wind induced mechanisms as air flows across the top of an external floating roof tank. These mechanisms may vary, depending upon the type of seals used to close the annular vapor space between the floating roof and the tank wall. Standing storage emissions from external floating roof tanks are controlled by one or two separate seals. The first seal is called the primary seal, and the other, mounted above the primary seal, is called the secondary seal. There are three basic types of primary seals used on external floating roofs, mechanical (metallic shoe), resilient (nonmetallic), and flexible wiper. The resilient seal can be mounted to eliminate the vapor space between the seal and liquid surface (liquid mounted), or to allow a vapor space between the seal and liquid surface (vapor mounted). A primary seal serves as a vapor conservation device by closing the annular space between the edge of the floating roof and the tank wall. Some primary seals are protected by a metallic weather shield. Additional evaporative loss may be controlled by a secondary seal. Secondary seals can be either flexible wiper seals or resilient filled seals. Two configurations of secondary seal are currently available, shoe mounted and rim mounted. Although there are other seal system designs, the systems described here compose the majority in use today. See Figure 4.3-8 for examples of primary and secondary seal configurations.

Typical internal floating roofs generally incorporate two types of primary seals, resilient foam filled seals and wipers. Similar in design

```
list nzb
IKJ52806I DATA SET NZB NOT IN CATALOG
READY
list nzb.blis.info
IKJ52806I DATA SET NZB.BLIS.INFO NOT IN CATALOG
READY

READY
list nzbihj52806i.blis.info
IKJ56709I INVALID DATA SET NAME, nzbihj52806i.blis.info
IKJ56718A REENTER THIS OPERAND+ -

IKJ56718A REENTER THIS OPERAND+ -
list
IKJ52806I DATA SET LIST NOT IN CATALOG
READY
dir/w
IKJ56621I INVALID COMMAND NAME SYNTAX
READY
dir
IKJ56500I COMMAND DIR NOT FOUND
READY
list
IKJ56700A ENTER DATA SET NAME  -
blis.info
IKJ52827I  BLIS.INFO

                    ***  BACT/LAER DETERMINATION ***

→  AL-0057:: DAIKIH AMERICA INC.                BACT (NEW)
          CITY: DECATUR                         STATE: AL  ZIP: :::::  REGGGGGGGGGGGGGGGGGGGGGION:4
          STORAGE OF PETROLEUM LIQUIDS                    SOURCE CODE:                    5.9
          SOURCE SIZE: ********** ::::::::::::::::::::
          PERMIT NO: 712-0061-X014
          PERMIT ISSUED: 08/28/91   ESTIMATED STARTUP DATE: 01/01/93
          DATA ENTERED:  05/31/92   LAST UPDATE:   /  /

     NOTES:    #2 FUEL OIL STORAGE TANK.
               ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
               ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
               ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
               ::::::::::::::::::::::::::::::::::::::::

     ****      FOR MORE INFORMATION, CALL (205)-271-7861
               DANIEL PRICE        ALABAMA DEPT OF ENVI


     *** A CONTROLLED PROCESS AND ITS POLLUTANT(S) ***


               STORAGE TANK                                PROCESS CODE:                   :::::
               THROUGHPUT:    40000.00 GAL

     POLLUTANT: VOC               CAS NUMBER: ::::::::::
                **********          :::::::::::::::::::: BASIS: TDB

                         ***  BACT/LAER DETERMINATION ***

     CA-0081:: KERN OIL & REFINING CO.              BACT (NEW)
               CITY: :::::::::::::::::::::::::::::: STATE: CA  ZIP: :::::  REGGGGGGGGGGGGGGGGGGGGGION:9
               COUNTY:           KERN
               STORAGE OF PETROLEUM LIQUIDS                SOURCE CODE:                    5.9
               SOURCE SIZE:      3300.00 BBL
               PERMIT NO: 2018063
               PERMIT ISSUED: 06/18/84   ESTIMATED STARTUP DATE: ::/::/::
               DATA ENTERED:  09/01/84   LAST UPDATE: 09/01/84
```

BARGE LOADING PROCESS CODE: :::::
THROUGHPUT: 120.00 MMGAL/YR

POLLUTANT: BENZENE CAS NUMBER: 71-43-2
************ :::::::::::::::::::: BASIS: BACT
FLARE EFFICIENCY: 95555555555555555555555.000%

*** BACT/LAER DETERMINATION ***

OH-0100B JEEP CORP. BACT (NEW)
JEEP PARKWAY
CITY: TOLEDO STATE: OH ZIP: ::::: REGGGGGGGGGGGGGGGGGGGGGGGION:5
STORAGE OF PETROLEUM LIQUIDS SOURCE CODE: 5.9
SOURCE SIZE: 70000.00 GAL
PERMIT NO: 04-370
PERMIT ISSUED: 02/25/87 ESTIMATED STARTUP DATE: 11/10/86
DATA ENTERED: 11/02/87 LAST UPDATE: / /

NOTES: ::
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**** FOR MORE INFORMATION, CALL (419)-693-0350
DALE KRYGIELSKI CITY OF TOLEDO, ENV

*** A CONTROLLED PROCESS AND ITS POLLUTANT(S) ***

STORAGE TANK, FUEL OIL PROCESS CODE: :::::
THROUGHPUT: 70000.00 GAL

POLLUTANT: VOC CAS NUMBER: ::::::::::
************* NOT APPLICABLE BASIS: N/S
SUBMERGED FILL

*** BACT/LAER DETERMINATION ***

OH-0116A SUN REFINING & MARKETING CO. BACT (NEW)
CITY: OREGON STATE: OH ZIP: ::::: REGGGGGGGGGGGGGGGGGGGGGGGION:5
STORAGE OF PETROLEUM LIQUIDS SOURCE CODE: 5.9
SOURCE SIZE: 23600.00 BBL
PERMIT NO: 04-419
PERMIT ISSUED: ::/::/:: ESTIMATED STARTUP DATE: 05/01/88
DATA ENTERED: 11/02/87 LAST UPDATE: / /

NOTES: ::
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**** FOR MORE INFORMATION, CALL (419)-693-0350
LINDA FURLOUGH CITY OF TOLEDO, ENV

*** A CONTROLLED PROCESS AND ITS POLLUTANT(S) ***

11046/8-74

RECORD OF TELEPHONE CONVERSATION

DATE 09-22-92

TO Doug Fulle
NAME/FILE NO.

FROM Darrel Graziani

CLIENT/PROJECT Florida Power Corporation / Polk County Site

SUBJECT BACT / LAER Determination No. AL-0057

CHARGE: DEPT. NO. 0751 CLIENT SYMBOL FPC OFS NO. 2563.544

DISCUSSION WITH Daniel Price
Alabama Department of Environment
ph. No. (201) 271-7861

COMMENTS

Daniel confirmed that no add-on controls were required due to low emissions (< 50 lb/yr) and economics. Submerged fill was loading method.

BY Darrel Graziani NAME Engineer TITLE 751 DEPT. NO.

CC:

920915DJG01

EBASCO SERVICES INCORPORATED

BY D. Graziani DATE 9-15-92 SHEET 1 OF 2

CHKD. BY _____ DATE _____ OFS NO. 2563.544 DEPT. NO. 751

CLIENT Florida Power Corporation

PROJECT Polk County Site

SUBJECT Fuel Oil Storage Tank Emissions

Tank Type: Fixed Roof — Emission Estimate: AP42 Section 4.3
Tank Diameter: 150 feet
Tank Height: 31 feet

Calculations

Tank Capacity: $V_t = \pi (\frac{D}{2})^2 \cdot H = (3.1416)(\frac{150 ft}{2})^2 \cdot 31 ft = 547,815 ft^3$

$V_{gal} = (547,815 ft^3)(\frac{7.4805 gal}{ft^3}) = 4,097,932$ gallons

Annual Throughput: $\dot{V}_{gal} = (4)(13,505 gal/hr)(500 hr/yr) = 27,010,000$ gallons/yr

Turnovers: $(27,010,000)(1/4,097,932) = 6.59$ times/yr

Requested Turnovers: 7 times/yr

* Requested Throughput: $(7)(4,097,932) =$ **28,685,524 gallons/yr**

Breathing Loses: $2.26 \times 10^{-2} M_V (\frac{P}{P_A - P})^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P C K_C$ (eqn. 1, pg. 4.3-5)

M_V = 130 lb/lb mol distillate fuel oil
P = 0.012 psia — distillate fuel oil at 80°F (True Vapor Pressure)
P_A = 14.7 psia — atmospheric pressure
D = 150 ft — tank diameter
H = 15.5 ft — average vapor space height
ΔT = 19.6 °F — diurnal temperature change
F_P = 1.0 — white paint
C = 1.0 — diameter is greater than 30 ft
K_C = 1.0 — product factor

$$L_B = [2.26 \times 10^{-2}][130][\frac{0.012}{14.7 - 0.012}]^{0.68}[150]^{1.73}[15.5]^{0.51}[19.6]^{0.50}[1][1][1]$$

$$L_B = 2,433.3 \text{ lbs/yr}$$

Calculations (cont.)

Working losses: $2.40 \times 10^{-5} M_V P V N K_N K_C$ (eqn. 2, pg. 4.3-8)

M_V = 130 lb/lbmol distillate fuel oil
P = 0.012 psia distillate fuel oil at 80°F (True Vapor Pressure)
V_t = 4,097,932 gallons Tank Capacity
N = 7 Tank turnovers
K_N = 1 less than 36 turnovers per year
K_C = 1 product factor

$$L_W = (2.40 \times 10^{-5})(130)(0.012)(4,097,932)(7)(1)(1)$$

$$L_W = 1,074.0 \text{ lb/yr}$$

$$L_T = L_B + L_W = 2,433.3 + 1,074.0 = 3,507.3 \text{ lb/yr} \quad \text{(pg. 4.3-12)}$$

$$L_T = [3,507.3 \text{ lb/yr}][\text{Ton}/2000 \text{ lb}] = 1.75 \text{ Tons/yr}$$

$$\boxed{L_T = 1.75 \text{ Tons/yr}}$$

Controls

Due to the low level of VOC emissions FPC is proposing submerged fill and drainage as "Known and Existing Vapor Emission Controls" for a distillate fuel oil storage tank.

Reference: Compilation of Air Pollution Emission Factors - Volume 1: Stationary Point and the Area Sources - AP-42, September 1985. Fourth Edition, Environmental Protection Agency

Request 15. The incremental removal cost of $6,400 per ton of CO removed seems excessive. Please provide the basis and the supporting documents of arriving at this figure. The application states that combustion control will limit CO emissions to a maximum of 25 ppmvd. What will be the actual CO emissions? Also, provide the incremental removal cost to limit CO emissions to 10 ppm.

Response 15. The $6,400 per ton incremental removal cost is based on reasonable and representative assumptions and methodologies and is appropriate for this application. Following is a discussion of the derivation of the capital and levelized annual costs which went into the determination of the incremental removal cost.

The most significant capital cost item associated with a CO catalytic oxidation system is the oxidation reactors. The estimated capital cost ($5,151,000) as shown in Table 4-5 of the permit application (attached for reference) is based on vendor quoted budgetary costs. Attached is a copy of a representative budgetary quote for a CO oxidation system. The budgetary quote was requested by Black & Veatch for three 150 MW combustion turbines (CTs), which are of the same size class as the proposed Polk County units. The CT performance data supplied with the request for quote was very similar to the performance data provided by GE for the units being considered for the Polk County Site project. The cost shown in the budgetary quote, $2,528,000, was then increased by one third to account for a fourth CT. The cost was then decreased by approximately two percent to account for the different catalyst volume requirements of the CT's for which the performance data was provided and the GE units upon which the Polk County Site project was based. This cost adjustment of two percent was calculated using the widely accepted method of taking the ratio of the treated flue gas flow rates raised to the six tenths power.

Because the oxidation reactor cost quotation was based on standard manufacturer offerings, an adder of twenty percent was included to account for typical ranges in budgetary quotes and adders required to meet typical Black & Veatch specification requirements. These specification requirements are common to the industry and emphasize system reliability. Erection cost for the reactors was assumed to be thirty percent of the equipment cost. This corresponds to a standard assumption based on engineering estimates of erection costs which typically range from 25 to 35 percent of the capital costs. The resulting capital cost for the four oxidation reactors was $5,151,000, as shown in Table 4-5.

Balance of plant costs include duct work, expansion joints, foundations, and miscellaneous access and support steel. Balance of plant costs were based on historical information from typical projects performed by Black & Veatch. Balance of plant costs for the four oxidation reactors was $612,000.

As shown in Table 4-5, the total 1992 capital cost for the four oxidation reactors was $5,762,000. The capital cost was adjusted for project contingency, escalation, and indirect costs as described in the NO_x economic impacts analysis section of the PSD application, Section 4.3.3.3. The addition of the 1992 capital costs, contingency, and escalation results in a capital cost for the four combined cycle units equipped with an oxidation system of $12,336,000, as shown in Table 4-5.

Levelized annual costs were calculated for operation and maintenance, lost power generation, and fixed charges on capital. Operation and maintenance costs assumed that the catalyst would be replaced every two years, consistent with the manufacturer's guarantee. It was further assumed that 80 percent of the original CO catalyst system cost was for catalyst material. Lost power generation costs were calculated by assuming that the pressure drop associated with the CO catalyst would result in a 0.42 percent derating of the combined cycle (CC) units (4 MW). As listed in Table 4-1 of the PSD application, the levelized replacement energy cost was assumed to be 62.01 mills/kWh. The levelized annual fixed charges on capital were assumed to be 16.35 percent of the total capital cost.

The maximum CO concentration of 25 ppm was provided by GE on a performance data sheet for a Dry Low NO_x III combustor. This CO concentration is what GE is willing to guarantee at this time for the Dry Low NO_x III combustor. The combustor is still in the developmental stage and is not expected to be commercially available until 1995. As stated in the PSD application, CO is formed by incomplete combustion of fossil fuels. At the same time, however, the formation of NO_x is reduced by incomplete combustion of fossil fuels. Therefore, combustor design changes which reduce NO_x formation tend to increase CO formation. The Dry Low NO_x III combustors have the lowest NO_x emissions guarantee currently offered by a major manufacturer of CT's in the 150 MW range. At this time it is uncertain what the actual CO emissions might be when the unit is in operation. Carbon monoxide emissions measured during recent performance testing for one other GE Frame 7 combustion turbine ranged from 0.9 ppm while firing fuel oil at peak load to 13.3 ppm while firing natural gas at base load. That turbine, however, is equipped with different combustor (guaranteed for 25 ppm NO_x and 25 ppm CO) than the new generation combustor proposed for the Polk County project. The new generation of combustor is not operating and therefore it is impossible at this time to predict actual Polk County Site CO emissions. However, because the NO_x emissions associated with the new generation combustor are reduced, it is reasonable to conclude that CO emissions may be

somewhat higher than recent testing on the Frame 7 indicates based on the previously stated relationship between CO and NO_x emissions. Still, GE is willing to guarantee 25 ppm CO for the new generation combustor. Therefore, based on the above discussion, it is concluded that 25 ppm is the appropriate emission limit for this application.

Black & Veatch has calculated that the incremental removal cost to limit CO emissions to 10 ppm will be approximately $8,000 per ton. This incremental removal cost is higher than the removal cost for an emission limit of 5 ppm ($6,400) due to the fact that the percent change in the estimated CO system cost was less than the percent change in CO emissions. Based on discussions with CO catalyst manufacturers, it is estimated that when compared to a unit with an 80 percent CO removal efficiency (25 ppm down to 5 ppm), the catalyst cost will be reduced by only 10 to 15 percent. This minor change in cost is primarily due to the fact that the catalyst dimensions cannot be reduced significantly due to structural strength considerations. A CO catalyst is only 2 to 3½ inches thick. The catalyst cell density can be reduced, however the total reduction in catalyst volume is relatively insignificant.

Request 16. Please submit a detailed listing of all the continuous emission monitoring systems (CEMs) required for this project. This should include the type of the CEM (in-situ or extractive), the make and model number, the pollutant it will monitor, and any associated data acquisition system.

Response 16. A detailed listing of the CEMs which will be selected for the project is not available yet. The Clean Air Act Amendments of 1990 dictate that CEMs be used to monitor emissions from affected utility units, which are believed to include the combined cycle units, but not the auxiliary boiler. Based on the proposed monitoring requirements in 40 CFR 75, FPC expects that the CEMs required for the combined cycle units will include data acquisition systems, and systems for monitoring NO_x, a diluent gas (O_2 or CO_2), and CO_2 (if the diluent gas chosen is O_2). FPC anticipates these regulations to be finalized shortly and that the final requirements will apply to the proposed units. FPC suggests that a condition be included in the PSD permit requiring the submission of CEM details to FDER for review and approval at a later stage in the project, but prior to procurement of the CT/HRSG equipment.

Request 17. What kind of control and monitoring equipment do you propose to use for continuously recording power generation (MWs), fuel injection rate (MMCF/hr or Gal/hr), and the water injection rate (Gal/hr)?

Response 17. These parameters will be continuously monitored and controlled by the plant's Digital Control and Information System (DCIS). This plant control system will have long-term data storage capability. A typical DCIS provides modulating control, digital control, monitoring, and indicating functions for the plant systems. The following functions are typically provided:

- Control the steam turbine generators, combustion turbines, and other systems in coordinated response to unit load demands.
- Control the balance-of-plant systems in response to plant demands.
- Monitor controlled plant equipment and controlled process parameters and provide this information to the plant operators.
- Provide control displays (printed logs, CRTs) for signals generated within the system or received from input/output (I/O).
- Provide consolidated plant process status information through displays presented in a timely and meaningful manner.
- Out of limit parameters of parameter trends are automatically alarmed, displayed on alarm CRT(s), and recorded on the alarm log printer.

Request 18. Please provide the names and addresses of all the manufacturers and suppliers that were contacted for budgetary quotations and engineering estimates in developing capital and annualized cost estimates for this project and a summary of all the equipment, raw material and the fuel costs, and also, associated economic parameters (*i.e.*, fixed charges on capital %, AFUDC % etc.).

Response 18. Attached is a copy of Table 4-1 - Project Economic Evaluation Criteria displayed on page 4-24 of the FPC Polk County Site PSD permit application. Table 4-1 lists all economic parameters used to calculate capital and annualized costs in the BACT analysis presented in Section 4.0 of the PSD permit application. The raw material (ammonia) costs shown on Table 4-1 are consistent with other BACT analyses Black & Veatch has performed recently. The fuel costs listed on Table 4-1 were developed from historical data collected over several years by Black & Veatch. It should be noted that the catalyst life of 3 years as shown in Table 4-1 is for the NO_x SCR catalyst rather than the CO catalyst life of two years as indicated in Response 15.

Black & Veatch has been responsible for the design of many CT projects and has developed numerous BACT analyses over the last several years. The projects have been for clients throughout the United States, including several in the EPA Region 4. Within the last year, Black & Veatch has performed approximately seven BACT analyses for combustion turbine projects alone. Consequently, Black & Veatch has developed a large data base on air quality control costs for CT projects. Below is a list of five vendors Black & Veatch has recently contacted regarding budgetary quotations and engineering estimates for combustion turbine projects, including the Polk County Site. Equipment costs are requested for projects in the design stage with sufficient frequency that it is a routine practice to scale those costs using good engineering judgement in order to provide realistic costs for BACT analyses.

1. Engelhard Corporation, Environmental Catalysts Group
   101 Wood Avenue, Iselin, New Jersey 08830
   (908) 205-6642 Contact: Mr. Abe Rosenstein

2. General Electric Company, GE Industrial & Power Systems
   P.O. Box 2944, 10550 Barkley, Overland Park, Kansas 66212
   (913) 967-6272 Contact: Mr. Michael Morris, P.E.

3. Henry Vogt Machine Company
   P.O. Box 1918, Louisville, Kentucky 40201
   (502) 634-1500 Contact: Mr. Paul Eberle

4. Peerless Manufacturing Company, SCR Systems Division
   2819 Walnut Hill Lane, Dallas, Texas 75229
   (214) 357-6181 Contact: Mr. Dayle Ellis

5. W. R. Grace and Company, Davidson Chemical Division
P.O. Box 2117, Baltimore, Maryland 21203
(301) 659-9000 Contact: Mr. Alan Thomas

TABLE 4-1
PROJECT ECONOMIC EVALUATION CRITERIA

Economic Parameters	Value
Contingency (percent)	20
Indirects (percent)	15
Escalation (percent)	5
Present Worth Discount Rate (percent)	10.23
Allowance for Funds Used During Construction (AFUDC) (percent)	10.23
Fixed Charges on Capital (percent)	16.35
Economic Life (years)	20
Capacity Factor (percent)	100
Levelization Factor	1.42
1992 Ammonia ($/ton)	250
1992 Labor ($/year)	53,660
1992 Levelized Natural Gas Cost ($/mmBtu)	4.88
1992 Levelized No. 2 Fuel Oil Cost ($/mmBtu)	9.39
1992 Levelized Energy Cost (mills/kWh)	62.01
1992 Levelized Annual Demand ($/kW)	77.04
Net Generation (MW)	940
Commercial Operation (Startup)	November 1998 - November 2000
Primary Fuel	Natural Gas
Back-up Fuel	Fuel Oil
Catalyst Life (years)	3

Source: Black & Veatch, 1992

Request 19. Does the applicant propose to do combination fuel (natural gas and fuel oil) firing for the combined cycle units? If so, provide details on how this will be accomplished.

Response 19. Although a simultaneous combination of natural gas and fuel oil can be used for firing the combustion turbines, it is not anticipated that this will be done other than for short time periods during transitions between fuels.

Request 20. Please provide a maximum value for fuel bound nitrogen for both natural gas and fuel oil. Also, calculate the maximum NO_x emissions based upon the proposed maximum value for fuel bound nitrogen for both natural gas and fuel oil.

Response 20. Tables 2-6 and 2-7 of the referenced PSD application provide "typical" nitrogen amounts for natural gas and fuel oil, respectively. It should be noted that the nitrogen contained in natural gas is in its gaseous N_2 form and is not fuel bound and thus is not related to increased NO_x formation as associated with fuel bound nitrogen. In fact, increased amounts of nitrogen in natural gas actually result in lower NO_x emissions from combustion turbines. The NO_x emissions reported in the permit application for natural gas firing are the maximum which are expected to occur regardless of the amount of nitrogen in the fuel.

In contrast to nitrogen in natural gas, the nitrogen contained in fuel oil as listed in Table 2-7 is all fuel bound. Until recently, Florida Power Corporation (FPC) and numerous fuel vendors had not been tracking fuel bound nitrogen (FBN) contents of fuel oils and therefore, any characterization of variability would be based on limited data. Distillate fuel oil FBN content within the FPC system has recently been found to range from 0.011 to 0.034 percent by weight. However, it should be noted that when fuel oil is required to have a maximum sulfur content of 0.05 percent by weight (as proposed for the Polk County project), oil suppliers plan on removing the additional sulfur by hydrotreating. FBN values will also be reduced using this process. Although the exact nitrogen content of the fuel oil to be purchased for the proposed plant is unknown, it is likely the FBN amounts will be substantially less. For purposes of this response, however, it can be conservatively assumed that the maximum FBN content of fuel oil will be 0.034 percent by weight.

General Electric has provided data to show the effect of increased levels of FBN in distillate fuel on the production of NO_x in the exhaust. A copy of GE's letter transmitting these data is attached. Holding the water injection rate to the maximum recommended, the GE data indicate that the NO_x emission level would increase to slightly less than 50 ppm with a FBN content of 0.034 percent by weight.

Use of the maximum water injection rate recommended by GE to limit the NO_x emission level to 42 ppm is determined in the permit application to represent use of Best Available Control Technology (BACT). As stated on page 2 of their letter, GE does not recommend increasing the water injection rate to compensate for distillate fuels that exceed 0.015 percent FBN. It is concluded, therefore, that the NO_x emission levels provided by GE for use of fuels with FBN greater than 0.015 percent represent the use of BACT under these circumstances.

GE Industrial &
Power Systems Sales

Power Generation User Sales
General Electric Company
1 River Road, Bldg. 2, 4th Floor, Schenectady, NY 12345
518 385-

October 6, 1992

Black & Veatch
11401 Lamar
Overland Park, Kansas 66211

Attention: Brian Peterman

Florida Power Corporation
Polk County Combined Cycle Project
B&V Project 18875

Gentlemen:

The following information and data is provided to assist you in supporting the FPC air permit application for the Polk County site.

The following table provides data to show the effect of increased levels of fuel bound nitrogen in distillate fuel on the production of NOx in the exhaust.

FBN % by Weight	NOx at 15% O_2
0.015 or less	42 ppm
0.020	44 ppm
0.025	46 ppm
0.030	48 ppm
0.035	50 ppm

The above assumes that the water injection rate is held constant at the level required to maintain 42 ppm with 0.015 percent or less FBN in the fuel. Increasing the water injection rate above that required to meet the 42 ppm requirement has the effect of reducing the life of the combustion system hardware. Therefore, GE does not recommend increasing the water injection rate to compensate for distillate fuels that exceed 0.015 percent FBN.

I trust this answers your questions in these areas.

CH Nelson

fpc-pc

Request 21. While the emission inventory used in the modelling included all sources that were originally agreed upon, additional modelling must be performed, taking into account the TECO Polk, Auburndale Cogeneration, and Ridge Cogeneration facilities. These are new facilities whose stack and emissions data were not known at the time FPC did its air quality analysis. This modelling will be performed by the Department unless you would prefer to do the remodelling yourself. A response as to who is going to perform this modelling is required as a part of FPC's reply to DER's incompleteness letter.

Response 21. FPC will perform the requested modelling, which will be submitted to FDER when completed. However, FPC would like to point out that including the TECO Polk project in the modelling is not required, according to the applicable modelling guidance, Draft New Source Review Workshop Manual, October 1990, since there was no "complete" PSD application for that source submitted as of thirty days prior to the submission of the FPC application.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee
To _____ Location _____
To _____ Location _____
To _____ Location _____
From _____ Date _____

Interoffice Memorandum

TO: Buck Oven

THRU: Clair Fancy

FROM: Syed Arif SA

DATE: October 8, 1992

SUBJECT: FPC Polk County Site - PA92-33, Mod 8043
PSD-FL-195

The Bureau of Air Regulation finds the above referenced application package insufficient. Based on our initial review of their proposal, we have determined that the following additional information is needed in order to process the application:

1. The emission calculations for the criteria and non-criteria pollutants are not adequately shown in the application. All calculations affecting emissions should be shown in their entirety, and not just summarized in tabular form. This includes showing the equations used, assumptions made and any supporting documents for emission calculations.

2. Please propose a maximum value for fuel bound nitrogen (FBN) for both natural gas and fuel oil. Also, calculate the maximum NOx emissions based upon the proposed maximum value for FBN for the Integrated Coal Gasification Combined Cycle (IGCC) unit, Pulverized Coal (PC) boiler and the Thermal Oxidation (TO) units.

3. Please submit a detailed process flow diagram for the IGCC unit showing the volumetric air flow rates for each stream when burning fuel oil and coal derived gas. Also, submit the same for the PC boiler when burning coal.

4. Please provide the net heating value of the gas being combusted by the flare, the exit velocity of the flare and what device will be used to detect the presence of a flame.

5. The applicant did not provide an economic evaluation or the cost effectiveness of the various control technologies for the BACT analysis. Without the presentation of an economic evaluation of the different control technologies for the regulated pollutants, the BACT analysis is not complete. Please provide the necessary information to do a meaningful BACT evaluation based on the cost effectiveness of the various technologies.

6. Please provide the overall IGCC NOx emission rate in lbs/MMBtu including the IGCC Combustion turbine and the Thermal Oxidation Units.

7. Please provide a detailed analysis of all the fugitive sources and emissions to include particulate matter emissions from coal handling sources, IGCC process sources and any other pollutant emissions from process vents, etc. The emission calculations should be shown in their entirety, including the equations used, assumptions made and any supporting documents used for emission calculations.

If you have any questions on the above, please call me at 8-1344.

SA:ch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

SEP 1 1992

4APT-AEB

RECEIVED

SEP 8 1992

Division of Air
Resources Management

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Florida Power Corporation,
Polk County (PSD-FL-195)

Dear Mr. Fancy:

This is to acknowledge receipt of the Prevention of Significant Deterioration (PSD) permit application for the above referenced facility. The proposed facility will be a 940 megawatt (MW) combined cycle facility, subject to the State Power Plant Siting Act (PPSA) and federal PSD regulations found at 40 CFR §52.21. Pursuant to the August 7, 1992, letter from Greer Tidwell, Regional Administrator of EPA, to Carol Browner, Secretary of FDER, the state has been granted delegation of authority to conduct the technical and administrative portions of the federal PSD program for sources subject to both the PPSA and PSD.

The project will consist of four 235 MW natural gas-fired combined cycle generating units, capable of converting to a coal-derived gas in the future. Each unit will consist of one combustion turbine, one heat recovery steam generator, and one steam turbine generator. An alternate configuration may consist of two 470 MW natural gas-fired combined cycle units, also capable of converting to coal-derived gas in the future.

The applicant proposes to limit NO_x emissions from the combustion turbines through advanced dry low-NO_x combustion technology and water injection, to limit SO_2 and H_2SO_4 Mist emissions through limiting the sulfur content of the No. 2 distillate fuel oil, to limit CO and VOC emissions through combustion control, and to limit PM/PM_{10}, Be, Bz, and As emissions through combustion control and the use of clean fuels.

We have reviewed the package as submitted and have no adverse comments. Thank you for the opportunity to review and comment on the package. If you have any questions or comments, please contact Mr. Scott Davis of my staff at (404) 347-5014.

Sincerely yours,

Beverly J. Hudson for

Brian L. Beals, Chief
Source Evaluation Unit
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

CHF/RL
Syed Arif
Max Linn
Bill Thomas, SWD
Linda Novak, Polk Co.

9-9-92 RRL

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

August 11, 1992

Ms. Linda Novak
Polk County Board of County Commissioners
Environmental Services Department
P. O. Box 60
330 West Church Street
Bartow, FL 33830

Dear Ms. Novak:

RE: Florida Power Corporation
Polk County Site PSD Permit Application
AC 53-217434, PSD-FL-195

Enclosed for your review is the above referenced permit application. Please forward your comments to the Bureau of Air Regulation by August 28, 1992. The Bureau's FAX number is (904)922-6979.

If you have any questions, please call Syed Arif or Max Linn at (904)488-1344 or write to me at the above address.

Sincerely,

Patricia G. Adams

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pa