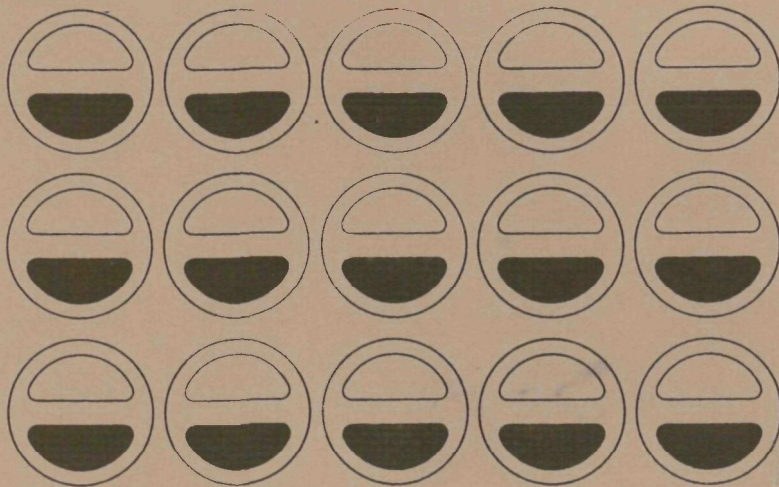
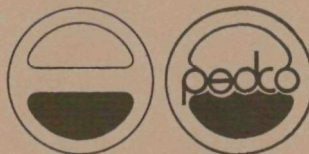
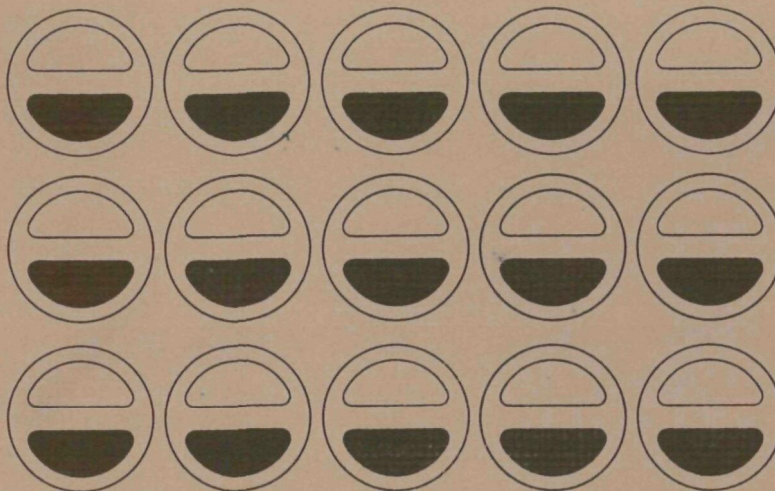




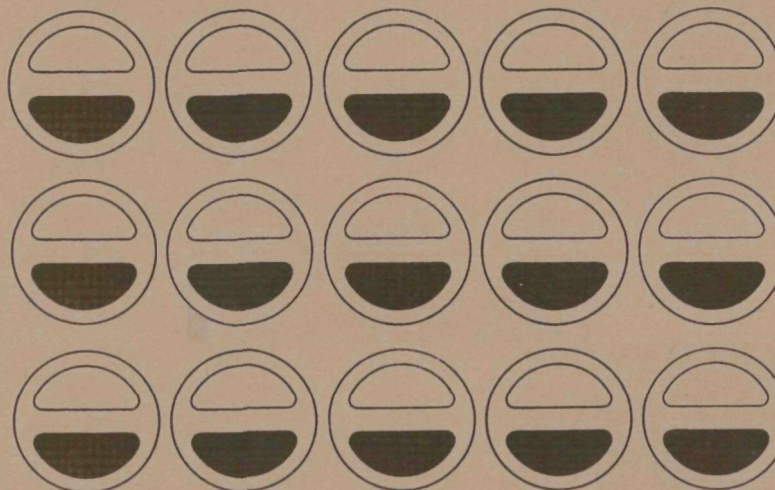
VISIBLE EMISSION SURVEY REPORT

U.S. STEEL CORPORATION
FAIRFIELD, ALABAMA

ESED NO. 79/12



PEDCo ENVIRONMENTAL



VISIBLE EMISSION SURVEY REPORT

U.S. STEEL CORPORATION
FAIRFIELD, ALABAMA

ESED NO. 79/12

Report No. 81-BOF-10

by

PEDCo Environmental, Inc.
11499 Chester Road
Cincinnati, Ohio 45246

Contract No. 68-02-3546
Work Assignment No. 8
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Task Manager
Mr. John Brown

U.S. ENVIRONMENTAL PROTECTION AGENCY
EMISSION MEASUREMENT BRANCH, MD-13
EMISSION STANDARDS AND ENGINEERING DIVISION
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

May 1981

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1.0 INTRODUCTION

The Clean Air Act mandates that Standards of Performance be established for new stationary air pollution sources. Establishment of these standards requires that an emission data base be developed for each source category. This data base is used as a guide for the establishment of Performance Standards which will minimize air quality degradation and yet not be impossible to attain.

During the week of May 11, 1981, PEDCo Environmental personnel performed visible emission surveys on two baghouses controlling emissions from a Basic Oxygen Process Furnace (BOPF) and supportive systems at U.S. Steel Corporation, Fairfield, Alabama. The purpose of the surveys was to provide emission data to establish New Source Performance Standards (NSPS) for fugitive emissions from secondary control devices for basic oxygen process furnaces. Particulate emission testing was also being conducted on the south mixer baghouse by another contractor during each day visible emission surveys were being performed. Evaluation of results of the visible emission surveys along with results of the particulate emission tests should provide a complete assessment of the performance of the fugitive emission control system installed at this facility.

This report consists of a summary of visible emission results, brief source description, test procedure, and appendices containing a list of project participants, and field data sheets.

During the survey a representative of the NSPS contractor was on site to monitor process operations and record pertinent information. Process data should be used to evaluate the representativeness of emissions and to compare emissions to specific process occurrences.

2.0 SUMMARY OF RESULTS

Two certified observers recorded simultaneous opacity measurements at the north and south mixer baghouses using procedures specified in EPA Method 9. Table 2-1 provides a summary of results and copies of the field data sheets appear in Appendix A and B. A total of 290 six-minute sets were recorded at the south mixer baghouse. The highest set averaged 14.6 percent opacity and occurred May 12, 1981, from 10:20 to 10:25 a.m. The remainder of the six-minute sets from this source averaged less than 8 percent opacity. During the afternoon meeting with plant personnel, on May 12, 1981, the test team reported discovery of a broken bag in the baghouse which could account for the opacity excursion. All opacity measurements were recorded at this source while particulate emission tests were being conducted.

A total of 114 six-minute sets were recorded from the north mixer baghouse. All sets from this source averaged less than 5 percent opacity.

Field data were also reduced in three-minute sets for each source. A total of 580 three-minute sets were recorded at the south mixer baghouse. The highest set averaged 29.6 percent opacity. The remainder of the three-minute sets from this source averaged less than 15 percent opacity.

TABLE 2-1. SUMMARY OF VISIBLE EMISSIONS AT U.S. STEEL

South mixer baghouse								
Observer	Number of six-minute sets	Number of three-minute sets	Range of readings % opacity	Range of six-minute set averages % opacity	Six-minute average opacity %	Range of three-minute set averages % opacity	Three-minute average opacity %	Average opacity %
A	145	290	0 - 45	0 - 14.6	0.2	0 - 29.6	0.2	< 5
B	145	290	0 - 30	0 - 7.7	0.2	0 - 14.6	0.2	< 5
North mixer baghouse								
A	57	114	0 - 30	0 - 2.9	0.08	0 - 4.2	0.08	< 5
B	57	114	0 - 5	0 - 0.4	0.01	0 - 0.8	0.01	< 5

A total of 228 three-minute sets were recorded at the north mixer baghouse. The highest set averaged 4.2 percent opacity. The remainder of the three-minute sets from this source averaged less than 5 percent opacity.

Tables 2-2 and 2-3 provides a summary of the six- and three-minute averages, respectively, for all tests conducted at the north and south mixer baghouses.

i

Hours of observation 2:33 - 4:35

Source: South mixer baghouse

2-4

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-2

Hours of observation 9:37 - 11:04

Date May 12, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-3 Hours of observation 12:00 - 4:17
 Date May 13, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	12:00 - 12:05	10	0.4	12:00 - 12:05	5	0.2
2	12:06 - 12:11	0	0	12:05 - 12:11	0	0
3	12:12 - 12:17	10	0.4	12:12 - 12:17	20	0.8
4	12:18 - 12:23	0	0	12:18 - 12:23	10	0.4
5	12:24 - 12:29	0	0	12:24 - 12:29	0	0
6	12:30 - 12:35	0	0	12:30 - 12:35	5	0.2
7	12:36 - 12:41	10	0.4	12:36 - 12:41	20	0.8
8	12:42 - 12:47	0	0	12:42 - 12:47	25	1.0
9	12:48 - 12:53	25	1.0	12:48 - 12:53	40	1.7
10	12:54 - 12:59	10	0.4	12:54 - 12:59	45	1.9
11	1:10 - 1:15	0	0	1:10 - 1:15	25	1.0
12	1:16 - 1:21	15	0.6	1:16 - 1:21	15	0.6
13	1:22 - 1:27	0	0	1:22 - 1:27	0	0
14	1:28 - 1:33	0	0	1:28 - 1:33	10	0.4
15	1:34 - 1:39	5	0.2	1:34 - 1:39	10	0.4
16	1:40 - 1:45	0	0	1:40 - 1:45	5	0.2
17	1:46 - 1:51	0	0	1:46 - 1:51	0	0
18	1:52 - 1:57	0	0	1:52 - 1:57	0	0
19	1:58 - 2:03	50	2.0	1:58 - 2:03	30	1.3
20	2:04 - 2:09	60	2.5	2:04 - 2:09	55	2.3
21	2:21 - 2:26	0	0	2:20 - 2:25	0	0
22	2:27 - 2:32	0	0	2:26 - 2:31	0	0
23	2:33 - 2:38	0	0	2:32 - 2:37	0	0
24	2:39 - 2:44	0	0	2:38 - 2:43	0	0
25	2:45 - 2:50	0	0	2:44 - 2:49	0	0
26	2:51 - 2:56	0	0	2:50 - 2:55	0	0
27	2:57 - 3:02	0	0	2:56 - 3:01	0	0
28	3:03 - 3:08	0	0	3:02 - 3:07	0	0
29	3:09 - 3:14	0	0	3:08 - 3:13	0	0
30	3:15 - 3:20	30	1.3	3:14 - 3:19	30	1.3
31	3:30 - 3:35	0	0	3:30 - 3:35	0	0

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-3 (continued)

Hours of observation 12:00 - 4:17

Date May 13, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-4

Hours of observation 9:30 - 10:29

Date May 14, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-5 Hours of observation 12:00 - 4:29
 Date May 14, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	12:00 - 12:05	0	0	12:00 - 12:05	0	0
2	12:06 - 12:11	0	0	12:06 - 12:11	0	0
3	12:12 - 12:17	0	0	12:12 - 12:17	0	0
4	12:18 - 12:23	0	0	12:18 - 12:23	0	0
5	12:24 - 12:29	0	0	12:24 - 12:29	0	0
6	12:30 - 12:35	0	0	12:30 - 12:35	0	0
7	12:36 - 12:41	15	0.6	12:36 - 12:41	20	0.8
8	12:42 - 12:47	0	0	12:42 - 12:47	0	0
9	12:48 - 12:53	20	0.8	12:48 - 12:53	15	0.6
10	12:54 - 12:59	0	0	12:54 - 12:59	5	0.2
11	1:10 - 1:15	0	0	1:10 - 1:15	0	0
12	1:16 - 1:21	0	0	1:16 - 1:21	10	0.4
13	1:22 - 1:27	10	0.4	1:22 - 1:27	5	0.2
14	1:28 - 1:33	0	0	1:28 - 1:33	5	0.2
15	1:34 - 1:39	5	0.2	1:34 - 1:39	10	0.4
16	1:40 - 1:45	0	0	1:40 - 1:45	0	0
17	1:46 - 1:51	0	0	1:46 - 1:51	0	0
18	1:52 - 1:57	0	0	1:52 - 1:57	0	0
19	1:58 - 2:03	0	0	1:58 - 2:03	0	0
20	2:04 - 2:09	0	0	2:04 - 2:09	0	0
21	2:20 - 2:25	0	0	2:20 - 2:25	0	0
22	2:26 - 2:31	0	0	2:26 - 2:31	5	0.2
23	2:32 - 2:37	0	0	2:32 - 2:37	0	0
24	2:38 - 2:43	0	0	2:38 - 2:43	0	0
25	2:44 - 2:49	0	0	2:44 - 2:49	0	0
26	2:50 - 2:55	0	0	2:50 - 2:55	0	0
27	2:56 - 3:01	0	0	2:56 - 3:01	0	0
28	3:02 - 3:07	0	0	3:02 - 3:07	0	0
29	3:08 - 3:13	0	0	3:08 - 3:13	0	0
30	3:14 - 3:19	0	0	3:14 - 3:19	0	0
31	3:30 - 3:35	0	0	3:30 - 3:35	0	0

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-5 (continued)

Hours of observation 12:00 - 4:29

Date May 14, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. USS-6 Hours of observation 1:45 - 4:34
Date May 15, 1981 Source: South mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. NM-1

Hours of observation 11:15 - 11:56

Date May 12, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. NM-2

Hours of observation 9:30 - 11:39

Date May 13, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. NM-3

Hours of observation 10:45 - 11:44

Date May 14, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-2. SUMMARY OF SIX-MINUTE AVERAGE OPACITY

Test No. NM-4

Hours of observation 9:30 - 11:39

Date May 15, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-1 Hours of observation 2:33 - 4:35
 Date May 11, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	2:33 - 2:35	0	0	2:34 - 2:36	0	0
2	2:36 - 2:38	0	0	2:37 - 2:39	0	0
3	2:39 - 2:41	0	0	2:40 - 2:42	0	0
4	2:42 - 2:44	0	0	2:43 - 2:45	0	0
5	2:45 - 2:47	0	0	2:46 - 2:48	0	0
6	2:48 - 2:50	0	0	2:49 - 2:51	0	0
7	2:51 - 2:53	0	0	2:52 - 2:54	0	0
8	2:54 - 2:56	0	0	2:55 - 2:57	0	0
9	2:57 - 2:59	0	0	2:58 - 3:00	0	0
10	3:00 - 3:02	0	0	3:01 - 3:03	0	0
11	3:03 - 3:05	0	0	3:04 - 3:06	0	0
12	3:06 - 3:08	0	0	3:07 - 3:09	0	0
13	3:09 - 3:11	0	0	3:10 - 3:12	0	0
14	3:12 - 3:14	0	0	3:13 - 3:15	0	0
15	3:15 - 3:17	0	0	3:16 - 3:18	0	0
16	3:18 - 3:20	0	0	3:19 - 3:21	0	0
17	3:21 - 3:23	0	0	3:22 - 3:24	0	0
18	3:24 - 3:26	0	0	3:25 - 3:27	0	0
19	3:27 - 3:29	0	0	3:28 - 3:30	0	0
20	3:30 - 3:32	0	0	3:31 - 3:33	0	0
21	3:42 - 3:44	0	0	3:42 - 3:44	0	0
22	3:45 - 3:47	0	0	3:45 - 3:47	0	0
23	3:48 - 3:50	0	0	3:48 - 3:50	0	0
24	3:51 - 3:53	0	0	3:51 - 3:53	0	0
25	3:54 - 3:56	0	0	3:54 - 3:56	0	0
26	3:57 - 3:59	0	0	3:57 - 3:59	0	0
27	4:00 - 4:02	0	0	4:00 - 4:02	0	0
28	4:03 - 4:05	0	0	4:03 - 4:05	0	0
29	4:06 - 4:08	0	0	4:06 - 4:08	0	0
30	4:09 - 4:11	0	0	4:09 - 4:11	0	0
31	4:12 - 4:14	0	0	4:12 - 4:14	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-1 (continued)

Hours of observation 2:33 - 4:35

Date May 11, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-2Hours of observation 9:37 - 11:04Date May 12, 1981Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	9:37 - 9:39	40	3.33	9:37 - 9:39	0	0
2	9:40 - 9:42	0	0	9:40 - 9:42	0	0
3	9:43 - 9:45	0	0	9:43 - 9:45	0	0
4	9:46 - 9:48	0	0	9:46 - 9:48	0	0
5	9:50 - 9:52	0	0	9:49 - 9:51	0	0
6	9:53 - 9:55	0	0	9:52 - 9:54	0	0
7	9:56 - 9:58	0	0	9:55 - 9:57	0	0
8	9:59 - 10:01	0	0	9:58 - 10:00	0	0
9	10:02 - 10:04	0	0	10:01 - 10:03	0	0
10	10:05 - 10:07	0	0	10:04 - 10:06	0	0
11	10:08 - 10:10	0	0	10:07 - 10:09	0	0
12	10:11 - 10:13	0	0	10:10 - 10:12	10	0.8
13	10:14 - 10:16	0	0	10:13 - 10:15	0	0
14	10:17 - 10:19	0	0	10:16 - 10:18	25	2.1
15	10:20 - 10:22	355	29.3	10:19 - 10:21	175	14.6
16	10:23 - 10:25	15	1.3	10:22 - 10:24	20	1.7
17	10:26 - 10:28	0	0	10:25 - 10:27	0	0
18	10:29 - 10:31	55	4.6	10:28 - 10:30	70	5.8
19	10:32 - 10:34	15	1.3	10:31 - 10:33	30	2.5
20	10:35 - 10:37	35	2.9	10:34 - 10:36	25	2.1
21	10:47 - 10:49	0	0	10:47 - 10:49	0	0
22	10:50 - 10:52	0	0	10:50 - 10:52	0	0
23	10:53 - 10:55	0	0	10:53 - 10:55	0	0
24	10:56 - 10:58	0	0	10:56 - 10:58	0	0
25	10:59 - 11:01	0	0	10:59 - 11:01	10	0.8
26	11:02 - 11:04	20	1.7	11:02 - 11:04	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-3 Hours of observation 12:00 - 4:17
 Date May 13, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	12:00 - 12:02	10	0.8	12:00 - 12:02	5	0.4
2	12:03 - 12:05	0	0	12:03 - 12:05	0	0
3	12:06 - 12:08	0	0	12:06 - 12:08	0	0
4	12:09 - 12:11	0	0	12:09 - 12:11	0	0
5	12:12 - 12:14	0	0	12:12 - 12:14	0	0
6	12:15 - 12:17	10	0.8	12:15 - 12:17	20	1.7
7	12:18 - 12:20	0	0	12:18 - 12:20	5	0.4
8	12:21 - 12:23	0	0	12:21 - 12:23	5	0.4
9	12:24 - 12:26	0	0	12:24 - 12:26	0	0
10	12:27 - 12:29	0	0	12:27 - 12:29	0	0
11	12:30 - 12:32	0	0	12:30 - 12:32	0	0
12	12:33 - 12:35	0	0	12:33 - 12:35	5	0.4
13	12:36 - 12:38	10	0.8	12:36 - 12:38	20	1.7
14	12:39 - 12:41	0	0	12:39 - 12:41	0	0
15	12:42 - 12:44	0	0	12:42 - 12:44	0	0
16	12:45 - 12:47	0	0	12:45 - 12:47	25	2.1
17	12:48 - 12:50	15	1.3	12:48 - 12:50	15	1.3
18	12:51 - 12:53	10	0.8	12:51 - 12:53	25	2.1
19	12:54 - 12:56	0	0	12:54 - 12:56	15	1.3
20	12:57 - 12:59	10	0.8	12:57 - 12:59	30	2.5
21	1:10 - 1:12	0	0	1:10 - 1:12	0	0
22	1:13 - 1:15	0	0	1:13 - 1:15	25	2.1
23	1:16 - 1:18	10	0.8	1:16 - 1:18	0	0
24	1:19 - 1:21	5	0.4	1:19 - 1:21	15	1.3
25	1:22 - 1:24	0	0	1:22 - 1:24	0	0
26	1:25 - 1:27	0	0	1:25 - 1:27	0	0
27	1:28 - 1:30	0	0	1:28 - 1:30	5	0.4
28	1:31 - 1:33	0	0	1:31 - 1:33	5	0.4
29	1:34 - 1:36	5	0.4	1:34 - 1:36	5	0.4
30	1:37 - 1:39	0	0	1:37 - 1:39	5	0.4
31	1:40 - 1:42	0	0	1:40 - 1:42	5	0.4

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-3 (continued)Hours of observation 12:00 - 4:17Date May 13, 1981Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
32	1:43 - 1:45	0	0	1:43 - 1:45	0	0
33	1:46 - 1:48	0	0	1:46 - 1:48	0	0
34	1:49 - 1:51	0	0	1:49 - 1:51	0	0
35	1:52 - 1:54	0	0	1:52 - 1:54	0	0
36	1:55 - 1:57	0	0	1:55 - 1:57	0	0
37	1:58 - 2:00	40	3.3	1:58 - 2:00	15	1.3
38	2:01 - 2:03	10	0.8	2:01 - 2:03	15	1.3
39	2:04 - 2:06	60	5	2:04 - 2:06	50	4.2
40	2:07 - 2:09	0	0	2:07 - 2:09	5	0.4
41	2:21 - 2:23	0	0	2:20 - 2:22	0	0
42	2:24 - 2:26	0	0	2:23 - 2:25	0	0
43	2:27 - 2:29	0	0	2:26 - 2:28	0	0
44	2:30 - 2:32	0	0	2:29 - 2:31	0	0
45	2:33 - 2:35	0	0	2:32 - 2:34	0	0
46	2:36 - 2:38	0	0	2:35 - 2:37	0	0
47	2:39 - 2:41	0	0	2:38 - 2:40	0	0
48	2:42 - 2:44	0	0	2:41 - 2:43	0	0
49	2:45 - 2:47	0	0	2:44 - 2:46	0	0
50	2:48 - 2:50	0	0	2:47 - 2:49	0	0
51	2:51 - 2:53	0	0	2:50 - 2:52	0	0
52	2:54 - 2:56	0	0	2:53 - 2:55	0	0
53	2:57 - 2:59	0	0	2:56 - 2:58	0	0
54	3:00 - 3:02	0	0	2:59 - 3:01	0	0
55	3:03 - 3:05	0	0	3:02 - 3:04	0	0
56	3:06 - 3:08	0	0	3:05 - 3:07	0	0
57	3:09 - 3:11	0	0	3:08 - 3:10	0	0
58	3:12 - 3:14	0	0	3:11 - 3:13	0	0
59	3:15 - 3:17	0	0	3:14 - 3:16	0	0
60	3:18 - 3:20	30	2.5	3:17 - 3:19	30	2.5
61	3:30 - 3:32	0	0	3:30 - 3:32	0	0
62	3:33 - 3:35	0	0	3:33 - 3:35	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-3 (continued)

Hours of observation 12:00 - 4:17

Date May 13, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-4

Hours of observation 9:30 - 10:29

Date May 14, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-5 Hours of observation 12:00 - 4:29
 Date May 14, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	12:00 - 12:02	0	0	12:00 - 12:02	0	0
2	12:03 - 12:05	0	0	12:03 - 12:05	0	0
3	12:06 - 12:08	0	0	12:06 - 12:08	0	0
4	12:09 - 12:11	0	0	12:09 - 12:11	0	0
5	12:12 - 12:14	0	0	12:12 - 12:14	0	0
6	12:15 - 12:17	0	0	12:15 - 12:17	0	0
7	12:18 - 12:20	0	0	12:18 - 12:20	0	0
8	12:21 - 12:23	0	0	12:21 - 12:23	0	0
9	12:24 - 12:26	0	0	12:24 - 12:26	0	0
10	12:27 - 12:29	0	0	12:27 - 12:29	0	0
11	12:30 - 12:32	0	0	12:30 - 12:32	0	0
12	12:33 - 12:35	0	0	12:33 - 12:35	0	0
13	12:36 - 12:38	0	0	12:36 - 12:38	5	0.4
14	12:39 - 12:41	15	1.3	12:39 - 12:41	15	1.3
15	12:42 - 12:44	0	0	12:42 - 12:44	0	0
16	12:45 - 12:47	0	0	12:45 - 12:47	0	0
17	12:48 - 12:50	20	1.7	12:48 - 12:50	15	1.3
18	12:51 - 12:53	0	0	12:51 - 12:53	0	0
19	12:54 - 12:56	0	0	12:54 - 12:56	5	0.4
20	12:57 - 12:59	0	0	12:57 - 12:59	0	0
21	1:10 - 1:12	0	0	1:10 - 1:12	0	0
22	1:13 - 1:15	0	0	1:13 - 1:15	0	0
23	1:16 - 1:18	0	0	1:16 - 1:18	0	0
24	1:19 - 1:21	0	0	1:19 - 1:21	10	0.8
25	1:22 - 1:24	5	0.4	1:22 - 1:24	5	0.4
26	1:25 - 1:27	5	0.4	1:25 - 1:27	0	0
27	1:28 - 1:30	0	0	1:28 - 1:30	0	0
28	1:31 - 1:33	0	0	1:31 - 1:33	5	0.4
29	1:34 - 1:36	5	0.4	1:39 - 1:36	0	0
30	1:37 - 1:39	0	0	1:37 - 1:39	10	0.8
31	1:40 - 1:42	0	0	1:40 - 1:42	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-5 (continued) Hours of observation 12:00 - 4:29
 Date May 14, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
32	1:43 - 1:45	0	0	1:43 - 1:45	0	0
33	1:46 - 1:48	0	0	1:46 - 1:48	0	0
34	1:49 - 1:51	0	0	1:49 - 1:51	0	0
35	1:52 - 1:54	0	0	1:52 - 1:54	0	0
36	1:55 - 1:57	0	0	1:55 - 1:57	0	0
37	1:58 - 2:00	0	0	1:58 - 2:00	0	0
38	2:01 - 2:03	0	0	2:01 - 2:03	0	0
39	2:04 - 2:06	0	0	2:04 - 2:06	0	0
40	2:07 - 2:09	0	0	2:07 - 2:09	0	0
41	2:20 - 2:22	0	0	2:20 - 2:22	0	0
42	2:23 - 2:25	0	0	2:23 - 2:25	0	0
43	2:26 - 2:28	0	0	2:26 - 2:28	5	0.4
44	2:29 - 2:31	0	0	2:29 - 2:31	0	0
45	2:32 - 2:34	0	0	2:32 - 2:34	0	0
46	2:35 - 2:37	0	0	2:35 - 2:37	0	0
47	2:38 - 2:40	0	0	2:38 - 2:40	0	0
48	2:41 - 2:43	0	0	2:41 - 2:43	0	0
48	2:44 - 2:46	0	0	2:44 - 2:46	0	0
49	2:47 - 2:49	0	0	2:47 - 2:49	0	0
51	2:50 - 2:52	0	0	2:50 - 2:52	0	0
52	2:53 - 2:55	0	0	2:53 - 2:55	0	0
53	2:56 - 2:58	0	0	2:56 - 2:58	0	0
54	2:59 - 3:01	0	0	2:59 - 3:01	0	0
55	3:02 - 3:04	0	0	3:02 - 3:04	0	0
56	3:05 - 3:07	0	0	3:05 - 3:07	0	0
57	3:08 - 3:10	0	0	3:08 - 3:10	0	0
58	3:11 - 3:13	0	0	3:11 - 3:13	0	0
59	3:14 - 3:16	0	0	3:14 - 3:16	0	0
60	3:17 - 3:19	0	0	3:17 - 3:19	0	0
61	3:30 - 3:32	0	0	3:30 - 3:32	0	0
62	3:33 - 3:35	0	0	3:33 - 3:35	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-5 (continued)

Hours of observation 12:00 - 4:29

Date May 14, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-6 Hours of observation 1:45 - 4:54
 Date May 15, 1981 Source: South mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	1:45 - 1:47	0	0	1:45 - 1:47	0	0
2	1:48 - 1:50	0	0	1:48 - 1:50	0	0
3	1:51 - 1:53	0	0	1:51 - 1:53	0	0
4	1:54 - 1:56	0	0	1:54 - 1:56	0	0
5	1:57 - 1:59	0	0	1:57 - 1:59	0	0
6	2:00 - 2:02	0	0	2:00 - 2:02	0	0
7	2:03 - 2:05	0	0	2:03 - 2:05	10	0.8
8	2:06 - 2:08	0	0	2:06 - 2:08	0	0
9	2:09 - 2:11	0	0	2:09 - 2:11	0	0
10	2:12 - 2:14	0	0	2:12 - 2:14	0	0
11	2:15 - 2:17	0	0	2:15 - 2:17	0	0
12	2:18 - 2:20	0	0	2:18 - 2:20	0	0
13	2:21 - 2:23	0	0	2:21 - 2:23	0	0
14	2:24 - 2:26	0	0	2:24 - 2:26	0	0
15	2:27 - 2:29	0	0	2:27 - 2:29	0	0
16	2:30 - 2:32	0	0	2:30 - 2:32	0	0
17	2:33 - 2:35	0	0	2:33 - 2:35	0	0
18	2:36 - 2:38	0	0	2:36 - 2:38	0	0
19	2:39 - 2:41	0	0	2:39 - 2:41	0	0
20	2:42 - 2:44	0	0	2:42 - 2:44	0	0
21	2:55 - 2:57	0	0	2:55 - 2:57	0	0
22	2:58 - 3:00	0	0	2:58 - 3:00	0	0
23	3:01 - 3:03	0	0	3:01 - 3:03	0	0
24	3:04 - 3:06	0	0	3:04 - 3:06	0	0
25	3:07 - 3:09	0	0	3:07 - 3:09	0	0
26	3:10 - 3:12	0	0	3:10 - 3:12	0	0
27	3:13 - 3:15	0	0	3:13 - 3:15	0	0
28	3:16 - 3:18	0	0	3:16 - 3:18	0	0
29	3:19 - 3:21	0	0	3:19 - 3:21	0	0
30	3:22 - 3:24	0	0	3:22 - 3:24	0	0
31	3:25 - 3:27	0	0	3:25 - 3:27	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. USS-6 (continued)

Hours of observation 1:45 - 4:34

Date May 15, 1981

Source: South mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-1

Hours of observation 11:15 - 11:56

Date May 12, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-2 Hours of observation 9:30 - 11:39
 Date May 13, 1981 Source: North mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	9:30 - 9:32	0	0	9:30 - 9:32	0	0
2	9:33 - 9:35	0	0	9:33 - 9:35	0	0
3	9:36 - 9:38	0	0	9:36 - 9:38	0	0
4	9:39 - 9:41	0	0	9:39 - 9:41	0	0
5	9:42 - 9:44	0	0	9:42 - 9:44	0	0
6	9:45 - 9:47	0	0	9:45 - 9:47	0	0
7	9:48 - 9:50	0	0	9:48 - 9:50	0	0
8	9:51 - 9:53	0	0	9:51 - 9:53	0	0
9	9:54 - 9:56	0	0	9:54 - 9:56	0	0
10	9:57 - 9:59	0	0	9:57 - 9:59	0	0
11	10:00 - 10:02	0	0	10:00 - 10:02	0	0
12	10:03 - 10:05	0	0	10:03 - 10:05	0	0
13	10:06 - 10:08	0	0	10:06 - 10:08	0	0
14	10:09 - 10:11	0	0	10:09 - 10:11	0	0
15	10:12 - 10:14	0	0	10:12 - 10:14	0	0
16	10:15 - 10:17	0	0	10:15 - 10:17	0	0
17	10:18 - 10:20	0	0	10:18 - 10:20	0	0
18	10:21 - 10:23	0	0	10:21 - 10:23	0	0
19	10:24 - 10:26	0	0	10:24 - 10:26	0	0
20	10:27 - 10:29	0	0	10:27 - 10:29	0	0
21	10:39 - 10:41	0	0	10:40 - 10:42	0	0
22	10:42 - 10:44	0	0	10:43 - 10:45	0	0
23	10:45 - 10:47	0	0	10:46 - 10:48	0	0
24	10:48 - 10:50	0	0	10:49 - 10:51	0	0
25	10:51 - 10:53	0	0	10:52 - 10:54	0	0
26	10:54 - 10:56	0	0	10:55 - 10:57	0	0
27	10:57 - 10:59	0	0	10:58 - 11:00	0	0
28	11:00 - 11:02	0	0	11:01 - 11:03	0	0
29	11:03 - 11:05	0	0	11:04 - 11:06	0	0
30	11:06 - 11:08	0	0	11:07 - 11:09	0	0
31	11:09 - 11:11	0	0	11:10 - 11:12	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-2 (continued)

Hours of observation 9:30 - 11:39

Date May 13, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-3

Hours of observation 10:45 - 11:44

Date May 14, 1981

Source: North mixer baghouse

[illegible]

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-4 Hours of observation 9:30 - 11:39
 Date May 15, 1981 Source: North mixer baghouse

Set No.	Observer 1			Observer 2		
	Time start-end	Opacity		Time start-end	Opacity	
		Sum	Average		Sum	Average
1	9:30 - 9:32	0	0	9:30 - 9:32	0	0
2	9:33 - 9:35	0	0	9:33 - 9:35	0	0
3	9:36 - 9:38	0	0	9:36 - 9:38	0	0
4	9:39 - 9:41	0	0	9:39 - 9:41	0	0
5	9:42 - 9:44	0	0	9:42 - 9:44	0	0
6	9:45 - 9:47	0	0	9:45 - 9:47	0	0
7	9:48 - 9:50	0	0	9:48 - 9:50	0	0
8	9:51 - 9:53	0	0	9:51 - 9:53	0	0
9	9:54 - 9:56	0	0	9:54 - 9:56	0	0
10	9:57 - 9:59	0	0	9:57 - 9:59	0	0
11	10:00 - 10:02	0	0	10:00 - 10:02	0	0
12	10:03 - 10:05	0	0	10:03 - 10:05	0	0
13	10:06 - 10:08	0	0	10:06 - 10:08	0	0
14	10:09 - 10:11	0	0	10:09 - 10:11	0	0
15	10:12 - 10:14	0	0	10:12 - 10:14	0	0
16	10:15 - 10:17	0	0	10:15 - 10:17	0	0
17	10:18 - 10:20	0	0	10:18 - 10:20	0	0
18	10:21 - 10:23	0	0	10:21 - 10:23	0	0
19	10:24 - 10:26	0	0	10:24 - 10:26	0	0
20	10:27 - 10:29	0	0	10:27 - 10:29	0	0
21	10:40 - 10:42	0	0	10:40 - 10:42	0	0
22	10:43 - 10:45	0	0	10:43 - 10:45	0	0
23	10:46 - 10:48	0	0	10:46 - 10:48	0	0
24	10:49 - 10:51	0	0	10:49 - 10:51	0	0
25	10:52 - 10:54	0	0	10:52 - 10:54	0	0
26	10:55 - 10:57	0	0	10:55 - 10:57	0	0
27	10:58 - 11:00	0	0	10:58 - 11:00	0	0
28	11:01 - 11:03	0	0	11:01 - 11:03	0	0
29	11:04 - 11:06	0	0	11:04 - 11:06	0	0
30	11:07 - 11:09	0	0	11:07 - 11:09	0	0
31	11:10 - 11:12	0	0	11:10 - 11:12	0	0

TABLE 2-3. SUMMARY OF THREE-MINUTE AVERAGE OPACITY

Test No. NM-4 (continued)

Hours of observation 9:30 - 11:39

Date May 15, 1981

Source: North mixer baghouse

[illegible]

3.0 SOURCE DESCRIPTION

The melt shop at U.S. Steel houses three basic oxygen furnaces. The unit tested was Furnace C, which is a Q-BOF or bottom oxygen blown furnace. Furnace C is equipped with a fugitive emission control system. This system consists of a canopy hood and the necessary duct work to transport emissions to a positive pressure baghouse. This baghouse also receives fugitive emissions from the south hot metal mixer which includes a ladle transfer hood and a torpedo car transfer hood.

The north hot metal mixer station, which includes a ladle transfer hood and a torpedo car transfer hood, is vented to a separate baghouse.

Tables 3-1 and 3-2 summarize the incidence of hot metal pouring at the south and north hot metal mixers, respectively.

TABLE 3-1. SOUTH MIXER BAGHOUSE
HOT METAL TRANSFERS

Date, 1981	Torpedo car dump time		Time ladle		Time melt poured ^a
	Start	Finish	In	Out	
5/13				14:42	14:34
	15:59 16:02	16:01 16:04	15:17	16:10	16:08
5/14				09:28	
			09:32	09:38	09:35
			09:43	09:48	09:44
			09:55	10:00	09:57
	10:22	10:24	10:23		10:31
	10:25	10:27			
				12:54	12:29
	12:56	12:58	13:00	13:17	13:13
	13:04	13:06	13:19	13:24	13:21
	13:08	13:10	13:29	13:34	13:30
	14:46	14:49	14:40		
	14:52	14:55		15:08	15:06
	14:58	15:01	15:14	15:18	15:15
5/15			15:46	16:10	16:07
	16:13	16:15	16:15	16:26	16:22
	16:17	16:19			
5/15			14:02	14:32	14:27
	15:44	15:46			
	15:48	15:50			
	15:53	15:55	15:52 16:19	16:03	16:00

^aSafe viewing location for observing transfers.

TABLE 3-2. NORTH MIXER BAGHOUSE
HOT METAL TRANSFERS

Date, 1981	Torpedo car dump time		Time ladle		Time melt sampled ^a
	Start	Finish	In	Out	
5/12			11:17	11:23	11:22
5/13				09:26	
			09:32	09:42	09:41
			09:47	09:50	09:49
			10:19	10:27	10:26
	10:39	10:41			
	10:43	10:46	10:42	10:50	10:49
			11:24	11:31	11:30
5/14			10:44	10:51	10:50
	11:06	11:11			
	11:13	11:16			
	11:24	11:27	11:30	11:38	11:37
5/15			09:36	09:43	09:42
			09:49	09:56	
			10:02	10:09	10:08
			10:24	10:30	10:29
	11:37	11:39			
	11:41	11:43			

^aLadle transfers made below ground level so not visible from recommended safe viewing location. Melt is sampled just after pouring so sample time is $\approx$ 1 minute after transfer is made.

4.0 TEST PROCEDURES

All opacity measurements were recorded according to EPA Method 9 procedures by a pair of certified observers. During each test both observers recorded emissions simultaneously at the same source. Special precautions were taken to ensure that observers were properly positioned with respect to the sun angle and the plume. The position of the observer with respect to the sun is illustrated on the back of the field data summary sheet for each test. Data obtained during each test were reduced in six-minute sets in accordance with the procedure outlined in EPA Method 9. Data were taken at fifteen second intervals for one hour. At the end of each hour the observers received a ten minute break to prevent eye fatigue. Copies of the observer's certification appear in Appendix C.

Due to the orientation of the outlet and location of the south mixer baghouse, opacity measurements could not be obtained during the morning hours consistent with Method 9 sun angle requirements. Therefore, opacity measurements were recorded at the north mixer baghouse during the morning hours and at the south mixer baghouse during the afternoon hours. Figure 4-1 presents a diagram of the Q-BOP shop and illustrates the locations of the north and south baghouses along with the locations of the observers during the survey.

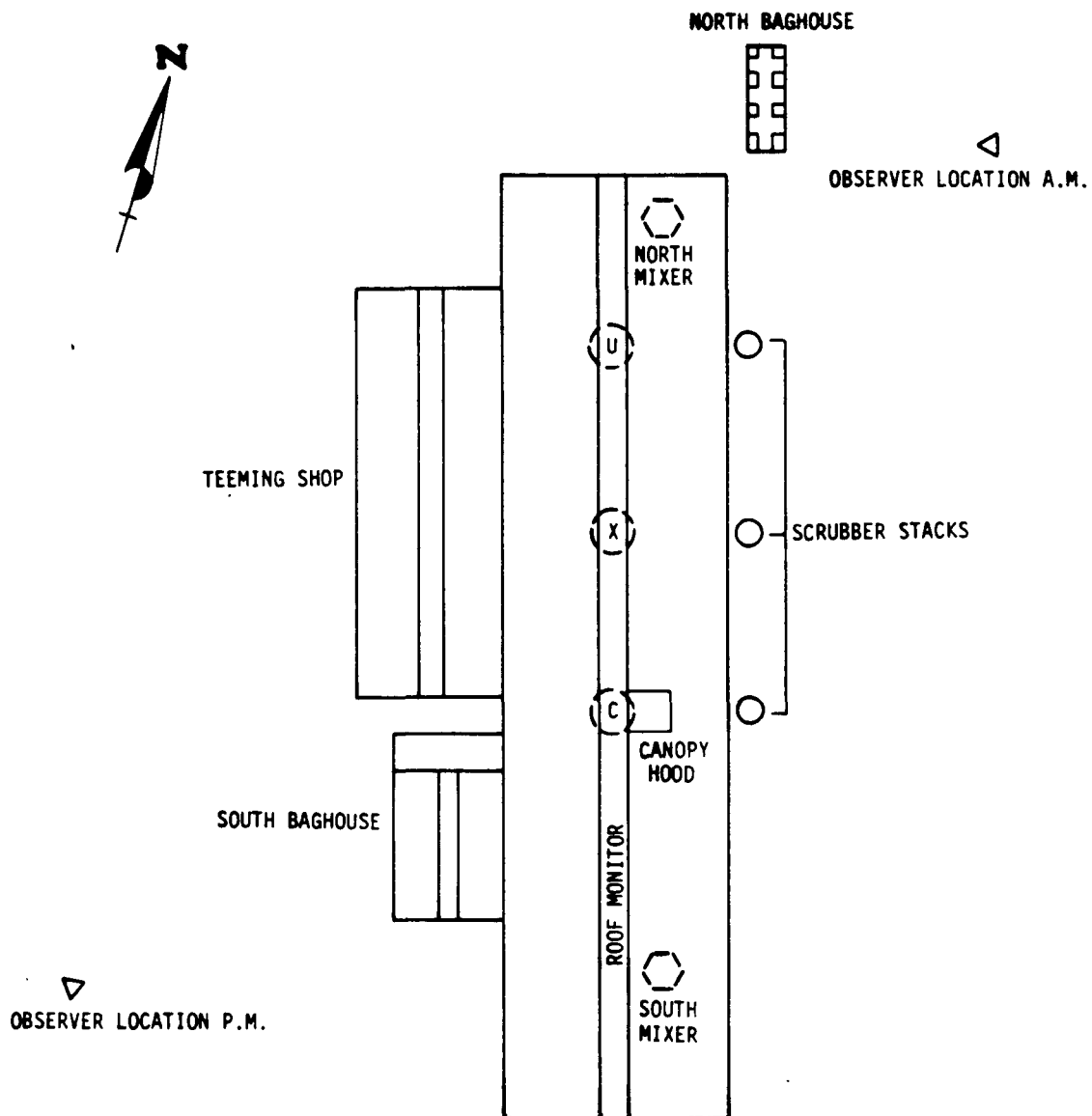


Figure 4-1. Q-BOP shop,
U.S. Steel, Fairfield, Alabama.

Due to the unavailability of the correct sun angle during test USS-2 on May 12, 1981, data collected during that run is of questionable value.