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The file name refers to the reference number, the AP42 chapter and section. The file name "ref02\_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

<b>AP42 Section:</b>	11.25
<b>Reference:</b>	7
<b>Title:</b>	Emission Test Report: Thiele Kaolin, Sandersonville, Georgia,  EMB-78-NMM-7,  Emission Measurement Branch, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1979.

Air

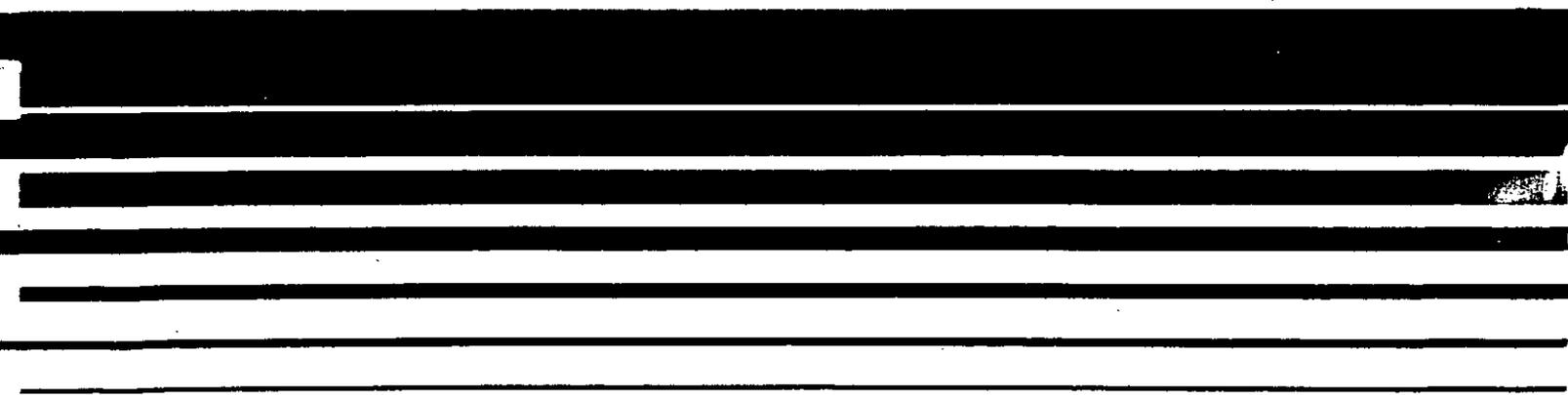


Clay

11418

**Emission Test Report**  
**Thiele Kaolin**  
**Sandersonville, Georgia**

*METHOD 22 - VISIBLE  
FUGITIVE EMISSIONS*



FUGITIVE EMISSIONS TEST REPORT

THIELE KAOLIN COMPANY

Sandersville, Georgia

ROY F. WESTON, . INC.

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Assistant Project Scientist

12/78

RFW Report No. 0300-81-08

Contract No. 68-02-2816

Work Assignment No. 7

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## SUMMARY

The Emission Measurement Branch of the U. S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a fugitive emission testing program at the Thiele Kaolin Company's clay processing facility in Sandersville, Georgia. The objective of the testing program was to measure fugitive emissions resulting from the rail car bulk loading operation. Three complete rail car loadings were evaluated for fugitive emissions in accordance with EPA Method 22 test procedures.

All tests were conducted during the period 6-7 December 1978 by Weston employees.

A detailed summary of test data and test results is presented in Table 1 of this report. Figure 2 shows a comparison of the emission rates observed at the point of fill during each of the three tests.

Comparison of the test results suggests relatively consistent rates of emissions for rectangular hatch rail cars. Mean emission frequencies during loading of these cars during Tests 1 and 2 are 9.3% and 7.0%, respectively.

Mean emission frequency for the "rake-back" rail car loading operations is decidedly greater (16.0%) than that observed for the other rail cars. This fact results from the difference in loading processes.

The primary source of emissions for all cars tested is the topping of each compartment with product and the subsequent repositioning of the feed hose in the next compartment.

## INTRODUCTION

The Emission Measurement Branch of the U. S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a fugitive emission testing program (EPA Method 22) at the Thiele Kaolin Company's clay processing facility in Sandersville, George. The objective of the testing program was to measure fugitive emissions resulting from the rail car bulk loading.

Three fugitive emission tests were conducted in loading port #1 which contained two loading sites that will be designated as site A (area nearest processing facility) and site B (area furthest from processing facility).

The location of each test and the type of car loaded are listed below:

- |         |                               |
|---------|-------------------------------|
| Test #1 | 1. Loading port #1            |
|         | 2. Loading site A             |
|         | 3. Rectangular hatch rail car |
| Test #2 | 1. Loading port #1            |
|         | 2. Loading site B             |
|         | 3. Rectangular hatch rail car |
| Test #3 | 1. Loading port #1            |
|         | 2. Loading site A             |
|         | 3. "rake-back" rail car       |

All tests were conducted during the period 6-7 December 1978 by Weston personnel.

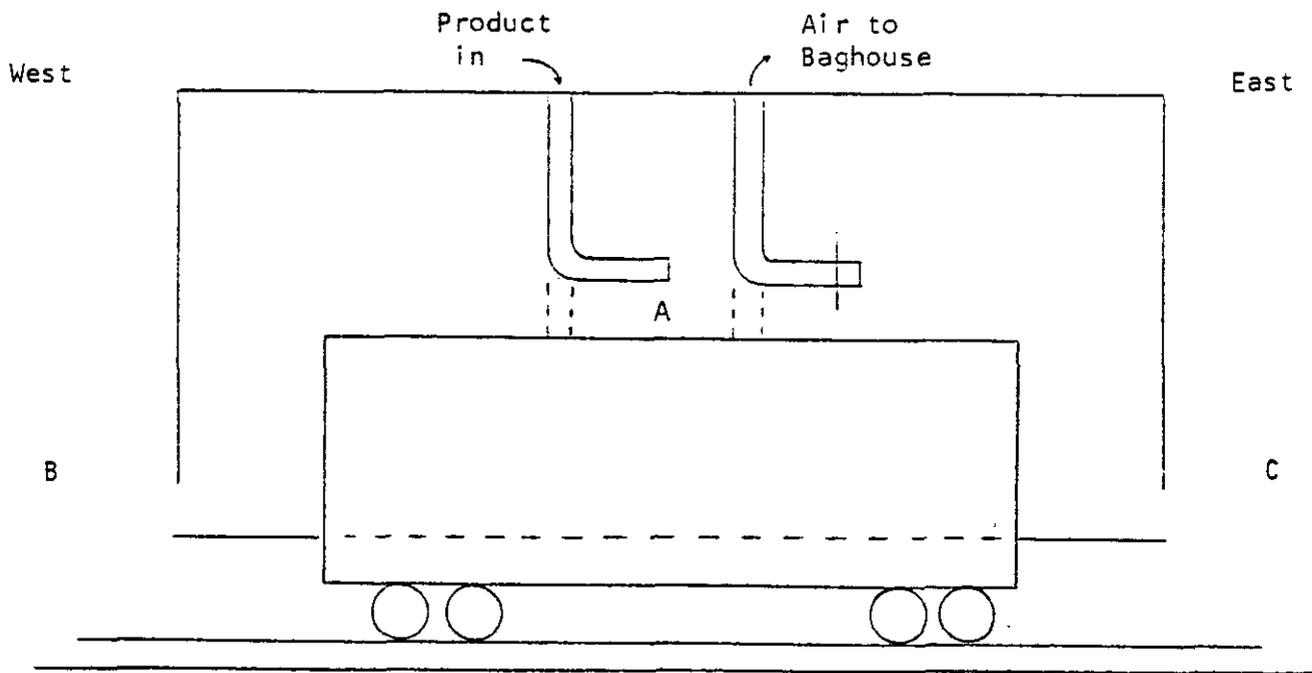
A detailed summary of test data and test results is presented in Table 1 and Figure 2 of this report. Raw test data and a list of project participants are provided in Appendices A and B, respectively.

### Discussion of Loading Procedure

Rail cars with the holding capacity of  $100 \pm 3$  tons of kaolin product are filled by means of an overhead hose which carries the product from the processing facility to the rail cars (Figure 1). During actual loading operations the feed hose is placed into either a rectangular or circular hatch within which is a filtering basket. The remaining area of the opened hatch is covered with tarpaulin to diminish any dust emission. In addition, a vacuum system is positioned in the vicinity of the feed hose to remove airborne particulates resulting from the loading operation. After filling one compartment, the rail car is drifted down the track so that the next section to be filled is beneath the feed line. The hose is then placed in this compartment and the hatch on the previous section closed. It should be noted that the topping of a compartment and the subsequent repositioning of the hose appears to be the primary source of fugitive emissions. This is found to be particularly true of the "rake-back" operation in which the product is manually pushed into the reaches of the compartment. The time required to fill an individual rail car is dependent on the type of rail car and the feed rate. Mean loading time for the rail cars observed was approximately 3 hours.

Thiele Kaolin Company  
Sandersville, Georgia

SCHEMATIC OF BULK LOADING OPERATION



Areas A, B and C Denote Areas Which  
Were Inspected for Fugitive Emissions  
According to EPA Method 22.

Figure 1

### Test Procedures

Three complete rail car loadings were evaluated for fugitive emissions in accordance with EPA Method 22 test procedures.

Fugitive emissions were examined at both ends of the loading shed (east and west) and at the actual point of fill into the railroad car (Figure 1).

The approximate time periods (24 hr clock) for which each test was made are presented below:

Test #1	6 December 1978	1640-2114
Test #2	7 December 1978	0815-1034
Test #3	7 December 1978	1315-1659

During each test, observations were made for 20 minute intervals followed by a 10 minute break.

## Test Results

Total accumulated observation time (AOT) and total accumulated emission time (AET) for each inspection location and for three fugitive emission tests are summarized in Table 1. Also presented in this table are the emission frequencies for each location ( $AET/AOT \times 100$ ) and the mean emission frequencies for each test.

Figure 2 compares the rates of emission at the point of fill for the three separate rail car loadings.

THIELE KAOLIN COMPANY  
Sandersville, Georgia

TABLE 1

Summary of Results of Fugitive Emission Tests performed  
on three separate rail car loadings

Observation Area	Accumulated Observation Period (min:sec)	Accumulated Emission Time (min:sec)	% Emission (AOP/AET x 100)
Test #1			
A	144:32	22:42	15.7
B	144:32	17:30	12.1
C	144:32	0:00	0
			$\bar{x} = 9.3$
Test #2			
A	99:45	18:50	18.9
B	99:45	2:06	2.1
C	99:45	0.00	0
			$\bar{x} = 7.0$
Test #3			
A	154:20	63:42	41.3
B	154:20	0:20	.2
C	154:20	9:21	6.1
			$\bar{x} = 15.9$

1. Designation of observation positions  
(Figure 1)

- A. Loading hose
- B. West end of shed
- C. East end of shed

COMPARISON OF RATES OF EMISSIONS OBSERVED AT THE  
POINT OF FILL FOR THREE SEPARATE RAIL CAR LOADINGS

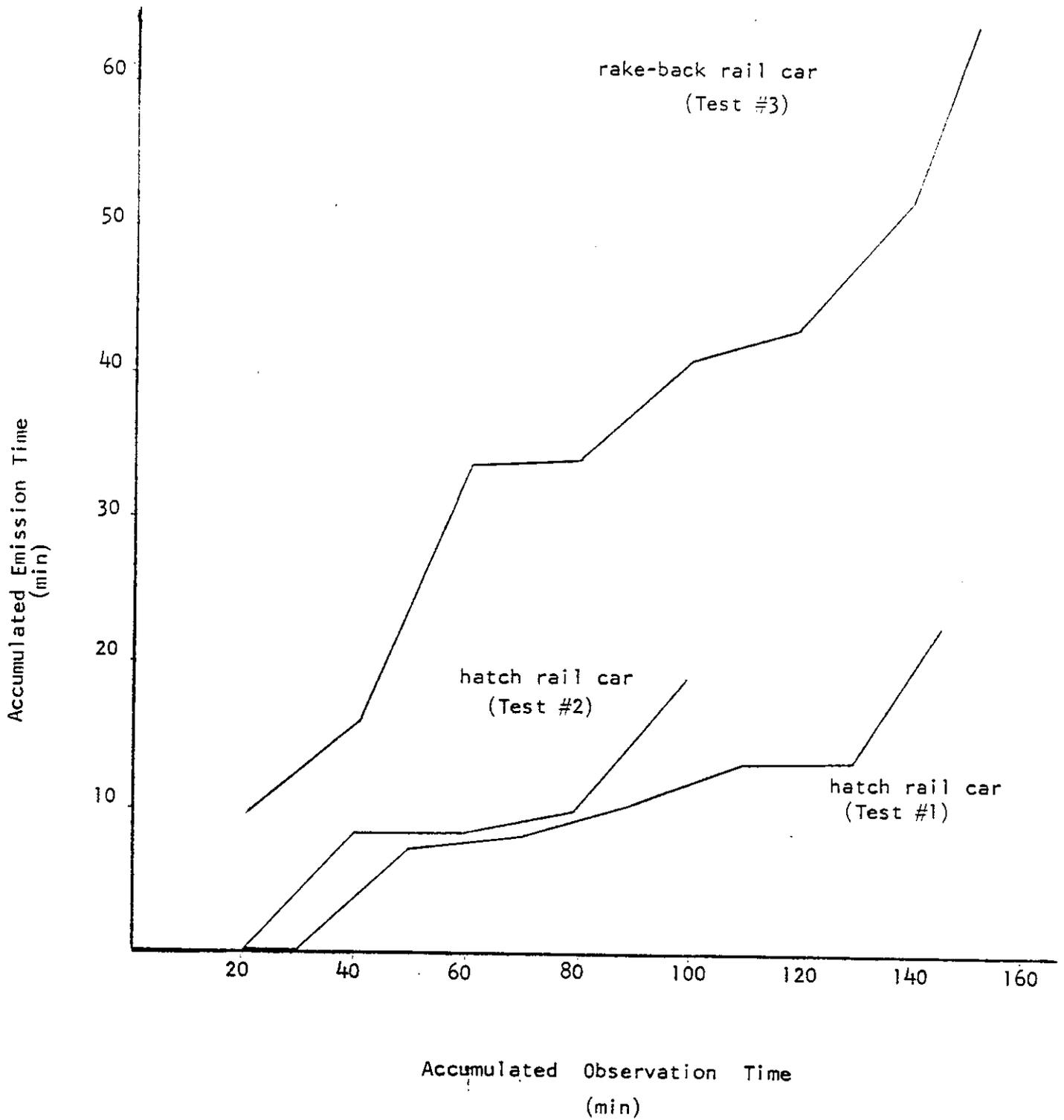


Figure 2

### Discussion of Results

From Table 1, it was apparent that the primary source of fugitive emissions in the bulk loading area was in the immediate vicinity of the fill area (Figure 1, Area A). By comparison and with the exception of Test #1, an insubstantial amount of particulate emissions was observed at either end of the loading shed.

During Test #1, however, emissions at the west end of the shed (Area B) were relatively similar to those observed at the filling area. Observations of particulate transport from the source area to the outside of the shed were undoubtedly influenced by such factors as local wind conditions, particle density, relative humidity, proximity of fill area to end of shed, visibility, etc.

Comparison of test results from Tests #1 and #2 suggested relatively consistent rates of emission for rectangular hatch rail cars. In neither of these tests, were mean emission frequencies greater than 10.0%. However, fugitive emissions observed at the source (area A) during the loading of the "rake-back" rail car (Test #3) were decidedly greater than similar observations made for the other rail cars (Figure 2). Mean emission frequency for Test #3 was 16.0%.

APPENDIX A

RAW DATA

FUGITIVE EMISSION  
INSPECTION

Company Thiele  
 Location Sandersville GA  
 Company Rep. Joy Roberts

Inspector C. DeBrock  
 Affiliation Env. E. Wood  
 Date 12/16/78

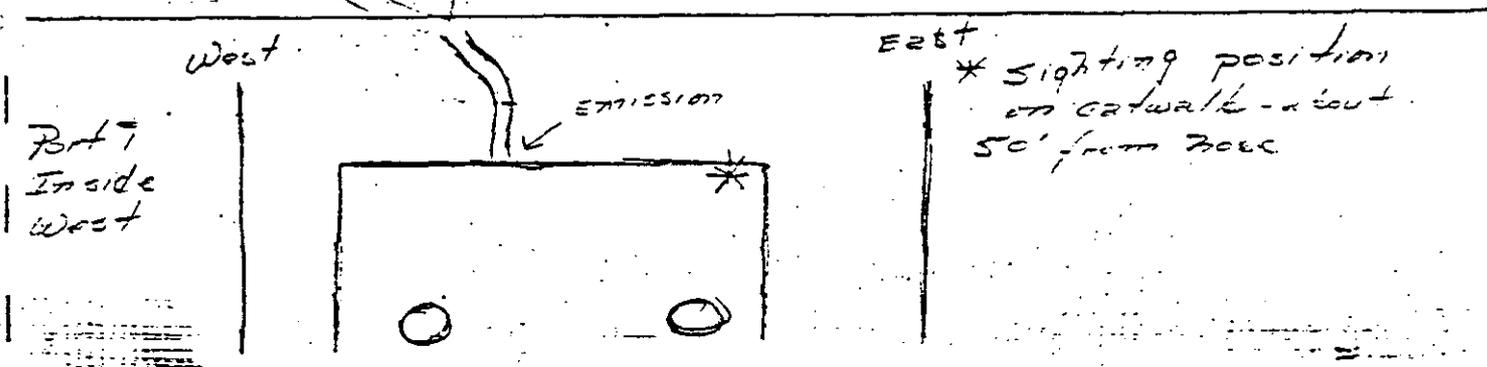
Sky Conditions Clear  
 Precipitation None

Wind Direction East  
 Wind Speed 2-5 mph

Facility Type Lead Refining & Shipping

Emission Source Lead loading area

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
<del>THIS WAS</del> SERIES of <del>TRUCKS</del> rather than ports. Note occasional dust seen to come from <del>begin</del> observation	1640-1700	20	:20
SOURCES other than loading ports may be seen by observer at end of shed? (No observation of dust was noted at that time)	1710-1720	30	:32
	1730-1750	50	7:06
Port 1 - Inside West	1800-1820	70	8:06
	1830-1850	90	11:10
	1900-1920	110	13:20
	1930-1950	130	13:35
	20:00 - 20:14:32	144:32	29:42
End Observation			

FUGITIVE EMISSION  
INSPECTION

Company Thiele Kaolin Co  
 Location Sandersville Georgia  
 Company Rep. J. Richards

Inspector Ted Moxon  
 Affiliation Ray F. Weston  
 Date 12/6/78

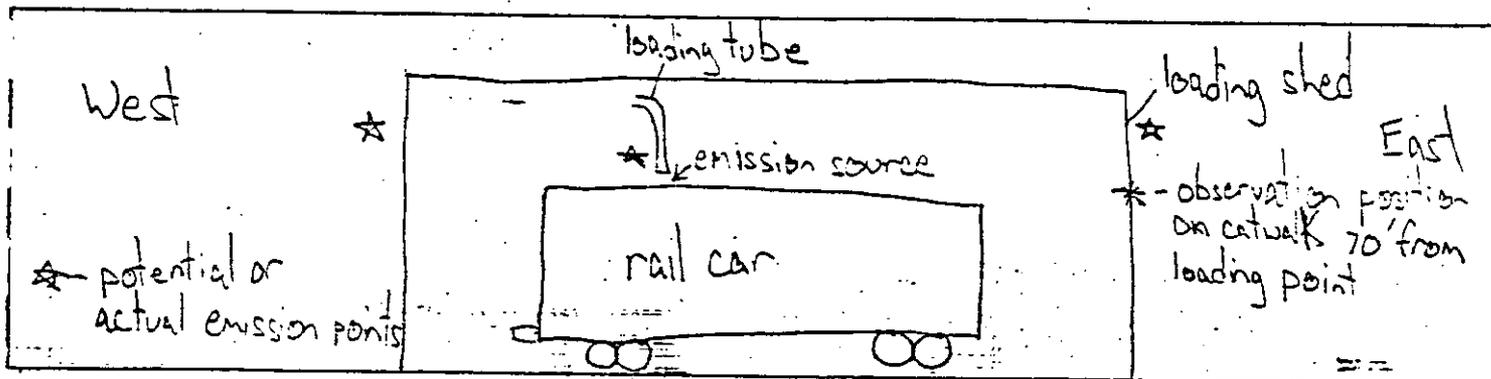
Sky Conditions clear  
 Precipitation 0"

Wind Direction To the west  
 Wind Speed 1 to 2 Kts

Facility Type Kaolin clay refining + shipping

Emission Source rail car loading area of dry  
kaolin clay material

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS

Time:	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1640-1700	20 min 0:00
	1710-1720	30 0:00
	1730-1750	50 0:00
	1800-1820	70 0:00
	1830-1850	90 0:00
	1900-1920	110 0:00
	1930-1950	130 0:00
End Observation	2000-2014:32	144:32 0:00

NEGATIVE EMISSION INSPECTION

Company JHiele  
 Location Sandersville Ga  
 Company Rep. Mr. J. Rachels

Inspector Mr. D. W. Malinos  
 Affiliation Rev. F. Weston  
 Date 17-6-78

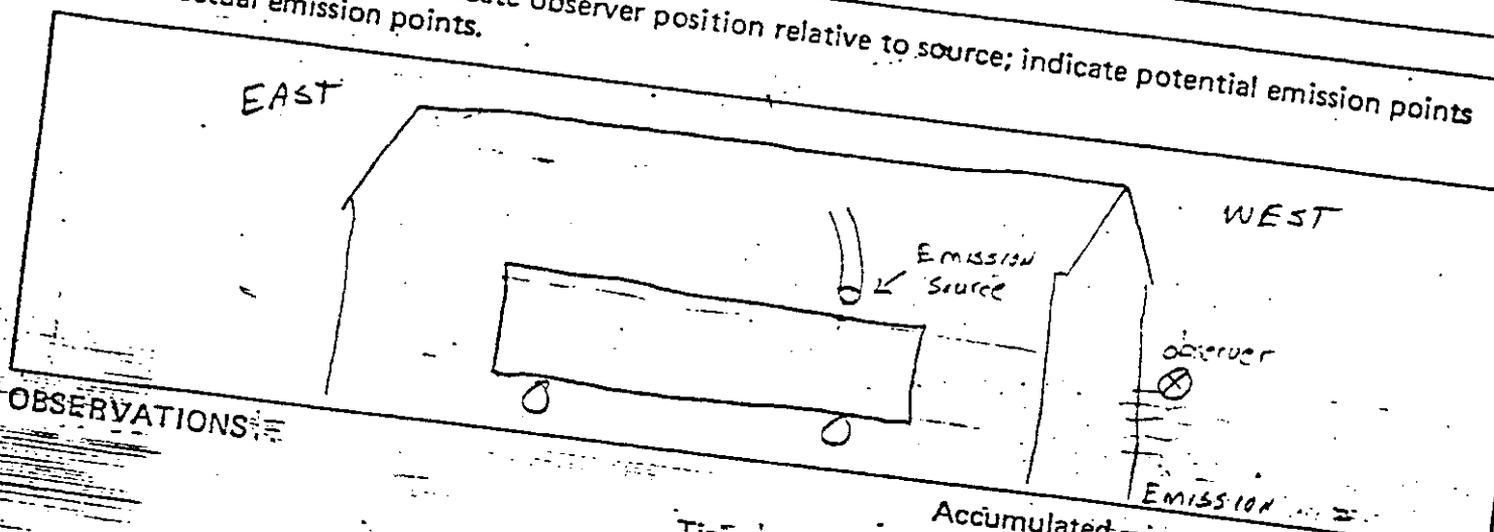
Sky Conditions Clear  
 Precipitation None

Wind Direction East - Northeast  
 Wind Speed 2-3 mph

Facility Type \_\_\_\_\_

Emission Source \_\_\_\_\_

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS:

Begin Observation	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
	16:40-17:00	20:00	0:00
	17:10-17:20	30:00	0:00
	17:30-17:50	50:00	0:00
	18:10-18:20	70:00	3:03.4
	18:30-18:50	90:00	3:03
	19:00-19:20	110:00	6:29
	19:30-19:50	130:00	8:15
	20:00-20:14:32	144:32	8:15
End Observation			17:30

ASK FOR JAY:

FUGITIVE EMISSION  
INSPECTION

Company Thiele Lumber Co  
 Location Sandersville Ga  
 Company Rep. Jay Kambels

Inspector Charles Jabroski  
 Affiliation Env. Protection Trng  
 Date 7 Dec 78

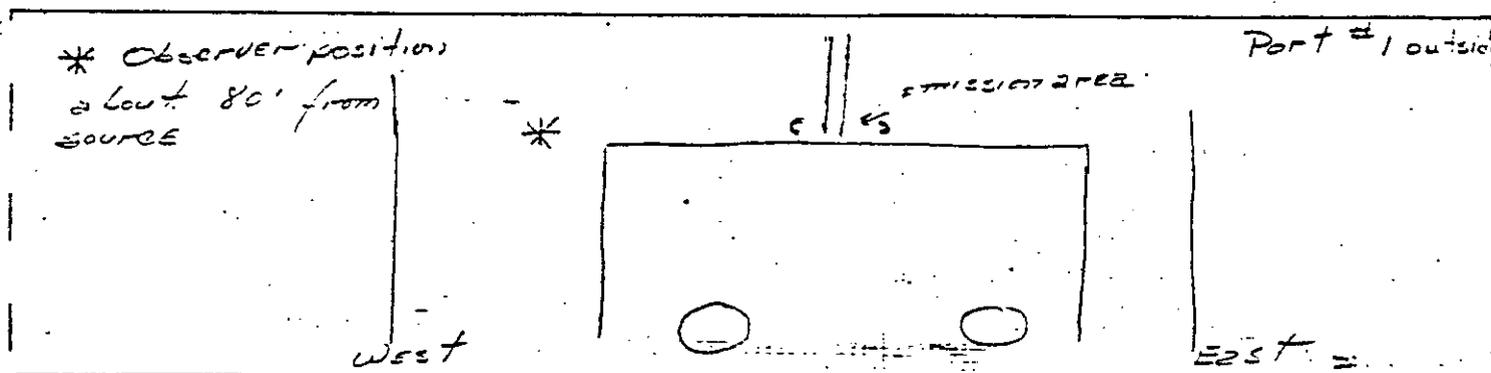
Sky Conditions Overcast  
 Precipitation \_\_\_\_\_

Wind Direction East  
 Wind Speed 5 mph

Facility Type Log Lumber Sheds

Emission Source Lumber Loading Area

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Port #1 - outside			
Note: one guy was being chance over			
Begin Observation	0815-0835	20	0:00
After not yet take not take	0845-0905	40	8:01
	0915-0935	60	8:03
	0945-1005	80	10:00
	1015-1034:45	99:45	18:50
End Observation			

JAY - 552-3951 EXT. 201

FUGITIVE EMISSION INSPECTION

Company Theile  
 Location Sandersville Ga  
 Company Rep. Mr. Jay Rachels

Inspector Mr. D. W. Maloney  
 Affiliation Rou F. Weston  
 Date 12-7-78

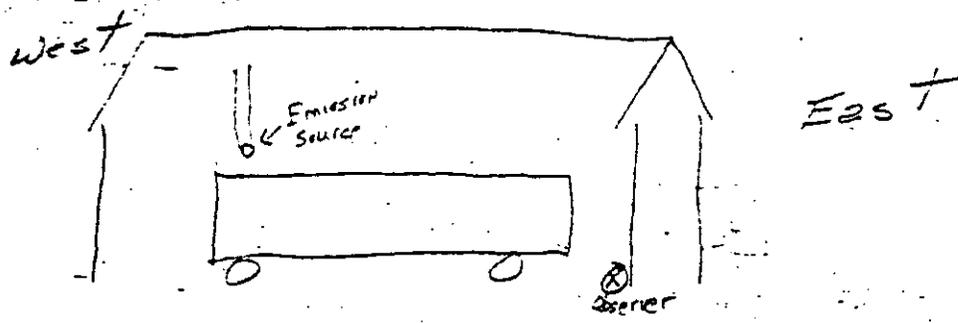
Sky Conditions Overcast  
 Precipitation None

Wind Direction East-Southeast  
 Wind Speed 2-3 mph

Facility Type \_\_\_\_\_

Emission Source \_\_\_\_\_

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



Observations	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	0815-0835	20:00	0:00
Humidity in Air seems to cause quicker settling of any dust.	0845-0905	40:00	0:00
	0915-0935	60:00	0:00
	0945-1005	80:00	0:00
	1015-1034:45	99:45	0:00
End Observation			

FUGITIVE EMISSION  
INSPECTION

Company Thiele Kolin Co  
 Location Sanger, California  
 Company Rep. J. Rachtels

Inspector Ted MOXAM  
 Affiliation Ray F Weston  
 Date 12/7/76

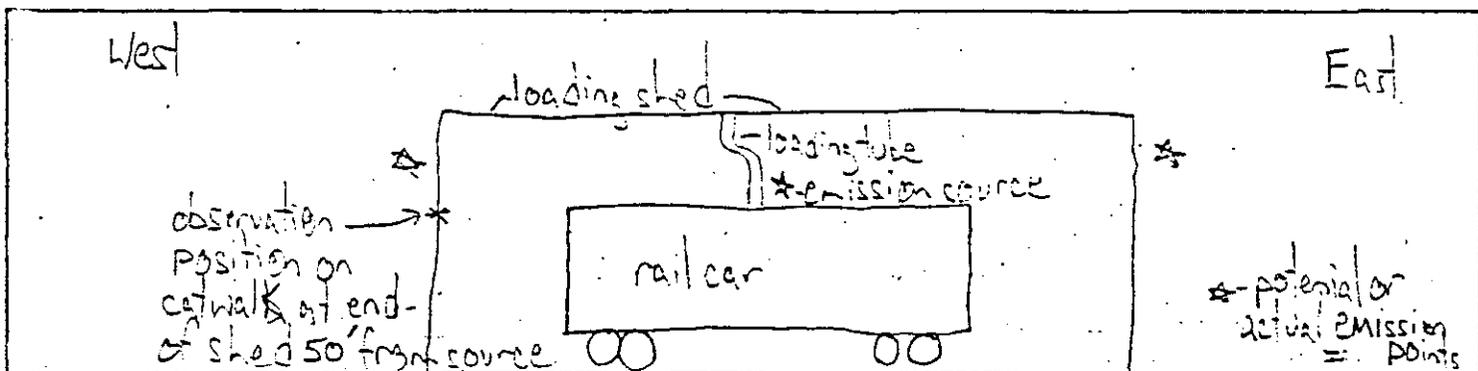
Sky Conditions overcast  
 Precipitation 0"

Wind Direction to the west  
 Wind Speed 1-2 Kts

Facility Type Kolin clay retining + shipping

Emission Source Rail car loading area of dry Kolin clay powder

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	0815-0835	20	0:00
	0845-0905	40	0:40
	0915-0935	60	0:40
	0945-1005	80	0:40
	1015-1034:45	99:45	2:06
End Observation			

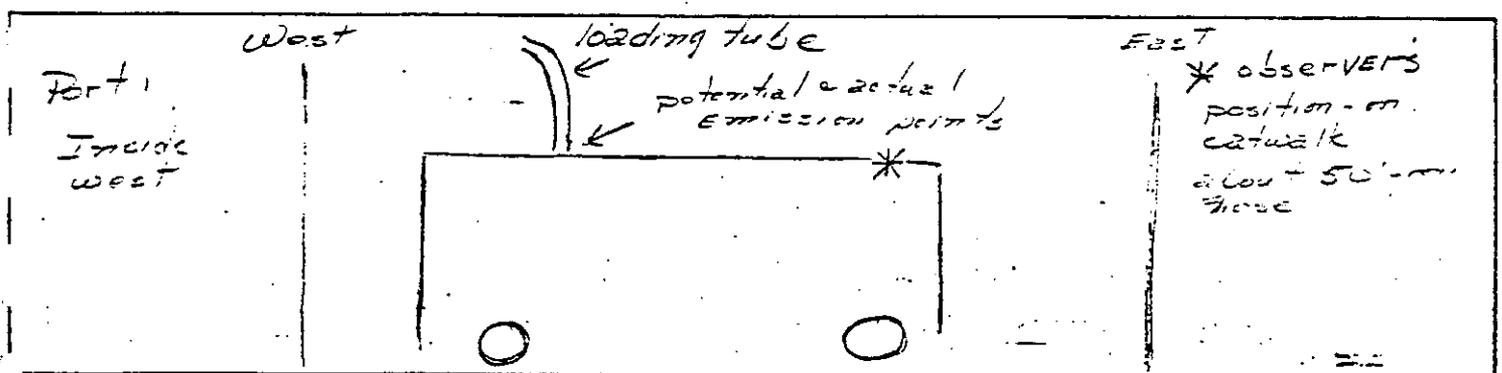
**FUGITIVE EMISSION  
INSPECTION**

Company <u>Wickert Co</u>	Inspector <u>Charles Thomas</u>
Location <u>Sandersville Ga</u>	Affiliation <u>Co. Engineer</u>
Company Rep. <u>T. Parikh</u>	Date <u>7 Dec 78</u>

Sky Conditions <u>Cloudy</u>	Wind Direction <u>East</u>
Precipitation <u>—</u>	Wind Speed <u>25 mph</u>

Facility Type <u>Rolling Mill Shop</u>	Emission Source <u>Roller loading area</u>
--	--

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	NOTE: <u>Roller-back car</u>	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
<u>Note: This is a roller-back car filled in Port 1 inside-west</u>		<u>1315-1325</u>	<u>20</u>	<u>9:29</u>
<u>Note: very little emission is observed during actual loading; most emission is the result of changing hose from one section of car to another.</u>		<u>1345-1405</u>	<u>40</u>	<u>14:28</u>
		<u>1415-1435</u>	<u>60</u>	<u>33:28</u>
		<u>1445-1505</u>	<u>80</u>	<u>34:19</u>
		<u>1515-1535</u>	<u>100</u>	<u>41:25</u>
		<u>1545-1605</u>	<u>120</u>	<u>43:44</u>
		<u>1615-1635</u>	<u>140</u>	<u>52:01</u>
		<u>1645-1659:20</u>	<u>154:20</u>	<u>63:42</u>
<u>End Observation</u>				

**FUGITIVE EMISSION  
INSPECTION**

Company Thiele Kaolin Co  
 Location Sandersville Ga  
 Company Rep. J. Rochels

Inspector Ted Moran  
 Affiliation Ray F. Weston  
 Date 12/7/78

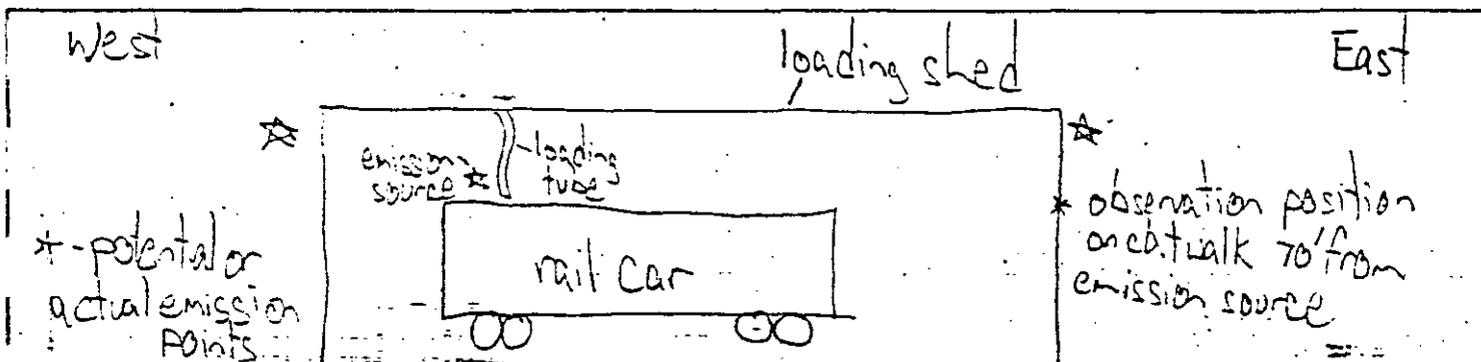
Sky Conditions partly sunny  
 Precipitation 0

Wind Direction to the west  
 Wind Speed 2-3 Kts

Facility Type Kaolin clay refining + shipping

Emission Source rail car loading area of dry kaolin clay powder

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



Observations	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1315-1335	20	0:20
	1345-1405	40	0:20
	1415-1435	60	0:20
	1445-1505	80	0:20
	1515-1535	100	0:20
	1545-1605	120	0:20
	1615-1635	140	0:20
	1645-1659:20	154:20	0:20
End Observation			

**FUGITIVE EMISSION  
INSPECTION**

Company Thiele  
 Location Sandersville, Ga  
 Company Rep. Mr. Joe Packels

Inspector Mr. F. Weston  
 Affiliation Ray F. Weston  
 Date 12-7-78

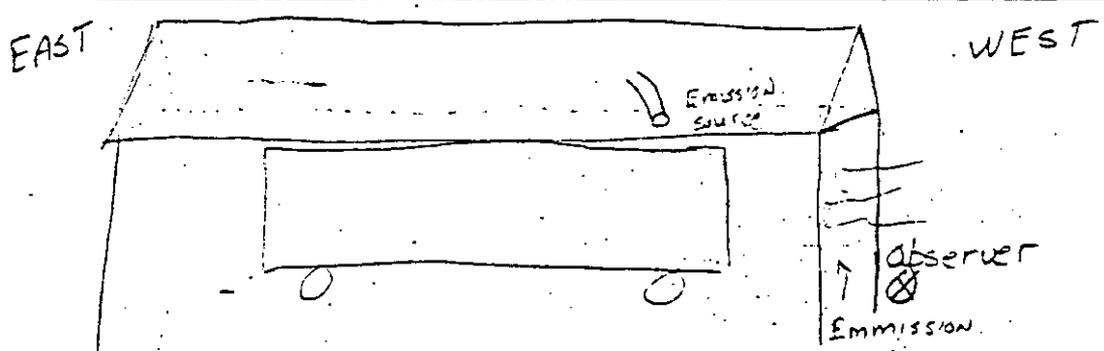
Sky Conditions Heavy with scattered clouds  
 Precipitation NONE

Wind Direction East  
 Wind Speed 1-2 mph

Facility Type Koolin Refinery

Emission Source Koolin Loading Area

Sketch emission source, indicate observer position relative to source; indicate potential emission points and/or actual emission points.



OBSERVATIONS	Time	Accumulated Observation Period (Min: Sec)	Accumulated Emission Time (Min: Sec)
Begin Observation	1315-1335	20:00	0:00
	1345-1405	40:00	0:24
	1415-1435	60:00	5:53
	1445-1505	80:00	5:53
	1515-1535	100:00	6:07
	1545-1605	120:00	6:07
	1615-1635	140:00	6:44
	1645-1659:20	154:20	9:21
	1715-1735		
End Observation	1745-1805		

APPENDIX B  
PROJECT PARTICIPANTS

The following Weston employees participated in this project:

Barry L. Jackson

Supervisor Air Testing

Charles J. Dobroski

Assistant Project Scientist

David Maloney

Laboratory Technician

Theodore Moxon

Laboratory Technician