

**ALLEGHENY COUNTY
BUREAU OF AIR POLLUTION CONTROL**

**Air Pollution Episode
No. 21-75
November 16 - 20, 1975**

INTRODUCTION

During the period November 16 to 20, 1975, Allegheny County experienced an air pollution episode during which Emergency Stage action levels were exceeded in the Liberty Borough-Clairton area and First Stage Alert levels were exceeded at the Downtown, Hazelwood, North Braddock and Glassport monitoring stations. This was the first time since episode monitoring began that Emergency Stage values were exceeded during stagnation conditions. Emergency Stage levels were previously exceeded at Liberty Borough-Clairton during a Wind Related Incident in January, 1973. The severity of the stagnation that occurred during November, 1975 was never previously experienced by the Bureau of Air Pollution Control since the establishment of the episode curtailment program.

The purpose of the episode program is to curtail sources by staged reductions during high air pollution periods so as to prevent ambient levels from reaching significant harm levels, the levels at which it has been determined that high asthmatic attack rates occur.¹ For particulates significant harm levels have been established at 1000 ug/m^3 over a 24-hour period. Article XVIII uses an assumed relationship of 125 ug/m^3 for 1 coefficient of haze (COH), for a 24-hour average COH of 8.0 equivalent to significant harm levels.

Seven telemetered stations in key areas of the County have been established to provide hourly pollution readings for SO_2 and particulates and serve as the principal stations for episode control in Allegheny County. Tape samplers for recording particulate levels are used to obtain real time data for episode control in addition to high-volume sampling. Data for these stations is telemetered to a central Bureau computer and also teletyped each hour to a private meteorological

1. Love, Sharp and Finklea, "Atmospheric Levels of Air Pollution Producing Significant Harm," In-House Technical Report, EPA, Sept. 9, 1971.

consultant, DeNardo & McFarland Weather Services, Inc. Episode personnel, the Monitoring Section and the Computer Section of the Bureau maintain on-call schedules to service any part of the system or to initiate episode actions when needed.

Over the past five years there have been 104 episodes, thirty-seven of which involved curtailment actions during stagnations. High air pollution Watches were declared on at least thirty-six other occasions based upon adverse meteorological forecasts when First Stage Alert levels were never reached.

Although Article XVIII assumes a relationship of 125 ug/m^3 to COH's it has been known for some time that the relationship of ug/m^3 to COH's for the Liberty Borough station was coming down from the $150 \text{ ug/m}^3/\text{COH}$ used in the Allegheny County Air Pollution Index, to levels below the $125 \text{ ug/m}^3/\text{COH}$ assumed for the episode criteria. A value more like 75 to $100 \text{ ug/m}^3/\text{COH}$ has been found from a statistical study to be more appropriate for that station. As a result, the value of COH's reported during the episode period tend to overstate the air quality levels when compared to the standards and criteria for ug/m^3 . High volume samples taken during this episode period further enforce this lower relationship.

During the episode it was discovered that the SO_2 instrument calibration was incorrect and corrections were made accordingly. A check of the calibration at the Liberty Borough Station was made by EPA immediately following the episode. They found the instrument reading 9% below their calibration, an acceptable range for this instrument.

The first indication of significant error in the SO₂ readings occurred on the afternoon of November 18, 1975. At 4:00 p.m. the SO₂ data from the Liberty Borough station was invalidated but this did not affect the episode actions in that area since particulates were the dominant pollutant and episode actions were primarily aimed at controlling particulates. Following identification of the calibration error, corrected data was substituted.

During the peak of the episode on November 19 and 20, monitoring personnel were scheduled to be at the Liberty Borough station throughout the night and day. These personnel began a program of running high volume samplers for 8-hour durations since the high particulate loadings were causing air flow rates to fall below Federally-recommended criteria for proper monitoring. Shorter sampling times alleviated this problem with the physical limitations of the instrument although shorter sampling times also violate the Federal criteria, but at least meaningful data could be collected for episode purposes if not reported as part of the annual averages. The high volume data is in Appendix A. The personnel at the station also recorded the increase on tape sampler readings every five minutes so that an extrapolated reading could be obtained if the pollutant levels exceeded the range of the instrument before the hour's sampling was completed.

Chronology of Events

Persistent winds from the southwest during the afternoon and evening of Saturday, November 15, 1975 caused increased pollution levels to be recorded at the Liberty Borough-Clairton monitoring station. By Sunday evening, the weather had changed and a recommendation for an Air Pollution Watch was received from DeNardo and McFarland Weather Services, Inc. Since the air quality had already deteriorated beyond First Stage levels, an Air Pollution Alert was declared for the Liberty Borough-Clairton area simultaneously with the declaration of the Watch at 9:00 p.m. The 24-hour average COH value was 3.20 COH's.

Technical Services personnel of the Bureau, the National Weather Service, Telephone Answering Service, COPAMS office of the Bureau of Air Quality and Noise Control of the Pennsylvania DER, and the meteorologist of the Philadelphia Regional office of EPA were notified. In addition, Duquesne Light, West Penn Power and Jones & Laughlin were notified of the Watch declaration as a prelude to possible curtailment orders as required. The Clairton Works of United States Steel Corporation was ordered to implement their First Stage Alert plan and to extend coking time to 20 hours from the normal 18 hours. Three hours later air quality had continued to deteriorate, so the order was modified to extend coking time to 24 hours.

On Monday evening, November 17, 1975, the forecast was for a continuation of the stagnation with conditions approximately the same as the day before. Five additional area plants including the Irvin Works of United States Steel Corporation were ordered at 11:00 p.m. to implement curtailment plans.

At 3:00 a.m., Tuesday, November 18, 1975, a First Stage Alert was declared in the Hazelwood area as air quality continued to deteriorate there. The 24-hour average COH value was 1.65; the 24-hour average SO₂ was reporting at 0.203 ppm at the time; the product was 0.338.

First Stage Alerts were declared in the Downtown and North Braddock areas at 10:00 p.m., November 18, 1975, after the evening forecast was received. The forecast indicated continued strong stagnation conditions. Tape sampler readings were 3.46 and 5.08 COH's for 24-hour average respectively. Ambient air quality reports were being received on a regular basis through the teletype connection from the computer to DeNardo & McFarland Weather Services, Inc.

The alert in the Braddock area was delayed until evening because of an apparent malfunction of the tape sampler indicated by the computer that morning and lower pollution readings during the afternoon. When checked the apparent malfunction was later identified as an overloading of the instrument for two consecutive hours by pollutant levels being too high.

At 10:00 p.m. on the evening of November 18, 1975, United States Steel Corporation was informed of the adverse forecast and advised of possible further curtailments if and when a Second Stage Alert was declared. It was agreed that a partial implementation of the Second Stage curtailments would be implemented voluntarily. This resulted in the Clairton ammonia plant being shut down at 1:30 a.m. which released additional fuel enabling the No. 2 Power House to convert to 95% gaseous fuel at 2:00 a.m., thus reducing emissions.

Due to periodic malfunctions, characteristic of tape samplers, and the high frequency of air pollution episodes in Liberty Borough-Clairton area, a backup tape sampler had been installed as an added precaution at that monitoring station in 1974. The computer had been programmed to automatically substitute data from the backup unit and code it as such when the input from the primary sampler was faulty. Between 9:00 p.m. and midnight on November 18, 1975, the coding indicated that data from the backup unit was being reported. Because of the possibility that the primary unit may have been reading off scale and concern that the secondary unit may not have been reading as high, Mr. Chleboski, Deputy Director, and Roger Westman,

Episode Control Officer, decided to dispatch the monitoring personnel on-call to check and correct the functioning of both units.

Mr. Popiel, Head of Air Quality Monitoring, dispatched Dante Amabile to the station at 1:00 a.m., November 19. Calls were placed to the station every 15 minutes between 1:15 and 3:00 a.m. awaiting Mr. Amabile's arrival. When reached at 3:00 a.m. he told of great difficulties with the visibility while driving which delayed his reaching the station.

Based on Mr. Amabile's analysis (Appendix B) that the primary tape sampler was reading so high it was off scale and that the head of the secondary tape sampler was not sealing correctly, the ambient levels were recalculated substituting the maximum level of the primary unit for the lower values of the secondary unit and the Second Stage Air Pollution Alert was declared for 4:00 a.m. The Clairton Coke Works was ordered to extend coking time to 28 hours.

The Episode Control Officer then reported to the Bureau and ordered all Clairton area sources to implement Second Stage Alert plans. Also five additional sources considered as optional sources due to their distance from the station were ordered to Second Stage Alert curtailments. A list of all sources affected is given in Appendix C.

The following people were contacted and advised of the Second Stage Alert and alert actions: Peter Finkelstein of the EPA Regional Office, the Telephone Answering Service, Dr. Jane Fleming acting in the absence of Dr. Clack as Director of the Health Department, and Denis Lohman of the Pennsylvania Department of Environmental Resources. Additionally, DER was requested to obtain substantial curtailments at the Elrama (Duquesne Light) and Mitchell (West Penn Power) generating plants which lie outside of Allegheny County but near the Clairton area.

Twelve hospitals listed in Appendix D were informed of possible increased demands on their services. Either the Night Duty Nurse or the emergency room staff were called. All news media sources (Appendix E) were called but only three local news were answering their phones at that hour.

At 8:30 a.m. on November 19, a call was received from Peter Finkelstein who was advised that air quality had deteriorated dramatically overnight and that EPA assistance might be required.

Contact was made with Mr. T. Wylie, Clairton Coke Plant Superintendent around 9:00 a.m. advising him of the rapid deterioration in air quality indicating that we would be ordering further extension in coking. Mr. Wylie was asked to advise the Bureau as to how long it would take to reach 42-hour coking as the Bureau anticipated exceeding Emergency Stage values. He informed the Bureau that it would take a minimum of 8 hours to reach 42-hour coking from the present 28 hours. Following contact with Mr. Wylie the Bureau was contacted by Mr. William Fader, Vice President - Eastern Operations requesting that all further coordination be directed through his office. Mr. Fader was advised of the air quality situation and was advised that further curtailments at Clairton would be required.

From 9:00 a.m. until noon, frequent discussions were held with DeNardo and McFarland Weather Services, Inc., Region III - EPA, Dr. Fleming and Mr. Fader. Time constraints did not permit the additional contacts directly with William Snee or Paul Morrison, Clairton Works personnel, who are the traditional contacts who facilitate handling of episodes by United States Steel Corporation.

At 12:00 noon, November 19, Emergency Stage values were exceeded and Clairton was ordered to 42-hour coking. Because of the inability to get through to Mr. Fader's office, the order was given direct to Mr. Wylie at the Clairton Coke Works.

Shortly after noon Mr. Chleboski and Mr. Westman left the Bureau for Commissioner Leonard Staisey's office for the official declaration of the emergency. They were joined by Dr. Jane Fleming and Miriam Blair of the Health Department Director's office. At the Commissioners' office, further telephone conversations were held with Daniel Snyder, EPA Regional Administrator, and his staff about the episode actions. The Regional Office made the following recommendations which added to or modified the ordered curtailments for United States Steel:

1. Coking time extended to 48 hours within 8 hours
2. Door leaks to be sprayed with sealing material
3. All USS Mon Valley boilers to be switched to gaseous fuel
4. All scarfing operations to be stopped

U. S. Steel was ordered to implement the additional curtailments at approximately 2:00 p.m.

The actions called for in Article XVIII with respect to closing schools, closing the airports, closing commercial establishments, and stopping automobile traffic were not implemented because the remaining monitoring stations were recording First Stage Alert values or below and emissions from these sources are not significant in the Liberty Borough-Clairton area which was the only location experiencing Emergency Stage values.

Commissioner Staisey, Chairman of the Board of County Commissioners, held a press conference at 2:30 p.m. to announce the declaration of the Emergency Stage Alert for the affected area. Mr. Chleboski and Mr. Westman then returned to the Bureau office.

All the non-Clairton Mon Valley boilers except Nos. 5 and 6 at Irvin were to have been on gaseous fuel since the declaration of the First Stage Alerts. Mr. Richard Dworek of U. S. Steel's Environmental Control office called about 4:00 p.m. on the 19th to inform us that boiler No. 7 at Irvin might have some coal being fired since it could operate within compliance with some coal, that boiler No. 6 might still have coal contrary to the order and that boiler No. 5 was not in service at this time. He also stated that the Duquesne scarfer would continue to operate since its emissions were minimal. He wanted to be certain that there would be no misunderstanding between the Bureau and United States Steel as to what actions were being taken. Mr. Westman informed him that these matters would be checked out and resolved which they were later that night.

The Bureau then arranged for Mr. Robert Felt, County Air Pollution Engineer, to check all of the boilers in the U. S. Steel Mon Valley plants. His report, Appendix F, shows that none of the boilers were burning coal.

About 5:00 p.m., Mr. Chleboski, Mr. Westman, and Dr. Arvid Ek left the Bureau offices for a press conference held by Representative John Heinz in the Federal Building in Downtown Pittsburgh. The Heinz news conference was not completed when a meeting between EPA and U. S. Steel officials began. Mr. Westman attended this meeting from the start. Mr. Chleboski and Dr. Ek joined the meeting at the conclusion of Representative Heinz's news conference. The question of the time schedule to

complete the extension of the 48-hour coking, whether coal was being utilized on the Irvin boilers, whether the Duquesne scarfer would be allowed to continue, and possible additional curtailments should air quality deteriorate further were discussed.

Mr. Robert Smith, Vice President and General Manager for U. S. Steel, stated no coal was being fired at any boilers including Irvin, and it was confirmed that the control unit on the Duquesne scarfer reduces emissions to 5 lbs./hr. or less. It was decided that that scarfer could continue to operate.

Mr. Smith could not state at what time they could be at 48-hour coking time since he had been out of touch with the plant. Dean Wilson, Superintendent of the Clairton Works, arrived at 8:30 p.m. and reported that the plant was presently at 42-hour coking and would be at 48 hours by midnight. Both EPA and the County stated that they were satisfied with U. S. Steel's performance and cooperation. This meeting resulted in no additional curtailments beyond that ordered by Allegheny County at 2:00 p.m., but possible further curtailments in iron and steel production were discussed if they were needed.

Throughout the episode, the four Coke Oven Process Technicians were periodically observing production rates at Clairton to determine compliance with the Bureau's orders. During the early morning hours of November 20, two Coke Oven Process Technicians, David Janocko and Richard Hoffman, were instructed to record quenches in the plant to again verify the coking rate. They were to be accompanied by John Hepola of Region III. William Snee of the Clairton Works informed Mr. Westman that process observers working with the door patchers would have to be used to accompany the inspectors since no additional personnel could be contacted within the short time period remaining before the inspectors were due at the plant. This information was relayed to EPA. This was later found not to be a problem since supervisory personnel accompanied the inspectors.

The report of the inspectors indicates compliance with the 48-hour coking time order. Reports on coking schedules for U. S. Steel - Clairton and J & L - Hazelwood are contained in Appendix G.

At 4:00 a.m., November 20, 1975, Emergency Stage values were no longer exceeded. Air Quality had improved in the Liberty Borough-Clairton area while no significant changes were seen at the other areas in First Stage Alert.

At 9:00 a.m., air quality levels (6.27 COH's for 24-hour average) had improved to the Second Stage levels at the Liberty Borough station and Mr. Chleboski permitted a return to a 42-hour coking. This action was taken because air pollution levels had been below Emergency Stage levels for five hours and were declining rapidly.

At noon on November 20, the other area plants were contacted to resume Second Stage production levels. At 2:00 p.m., the Emergency was lifted with EPA's concurrence. All criteria for termination were met as an afternoon weather report indicated a higher than expected ventilation rate. Clairton was permitted to proceed to normal coking time if not attained before 8:00 a.m., the next day, November 21, 1975. United States Steel provided an actual schedule of planned production resumption as given in Appendix H. The hospitals were informed of the end of the emergency. The Liberty Borough-Clairton area remained in First Stage Alert status (5.26 COH's for 24-hour average).

At 10:00 p.m., the DeNardo & McFarland Weather Services, Inc. issued the next forecast which was for good dispersion for the next 24 hours and again recommended cancellation of the Watch. The process was begun to contact all industries, agencies, and affected personnel to terminate all the First Stage Alerts

(i.e., Downtown, Hazelwood, Braddock, Glassport, and Liberty Borough-Clairton) and to terminate the Watch. These steps were accomplished by midnight. The Bureau offices were no longer manned after this point. Additional manpower at the office and at the stations had required 173 hours of overtime during this episode.

Analysis

Based upon best analysis of the high volume and tape sampler data, significant harm levels of air pollution (1000 ug/m³) were avoided. Any combination of high volume readings for the period around and including Wednesday, November 19, 1975, show that a 24-hour average value of 1000 ug/m³ was not reached. Also, since the tape samplers at Liberty Borough do not reflect the assumed relationship of 125 ug/m³/COH, but rather a relationship closer to 75 or 100 ug/m³/COH, these instruments further support the analysis that significant harm levels were not reached.

High volume readings show that Second Stage values were not exceeded before the early morning hours of Wednesday, November 19, 1975. It was during this time period that air quality rapidly deteriorated. This rapid deterioration in air quality did not permit sufficient time for Second Stage curtailments to take effect, causing emergency action levels to be reached.

Recommendations

1. The recommended Federal Episode Criteria should be adopted in place of the present Article XVIII criteria.

Article XVIII differs from the Federal Episode Criteria which has a Second Stage particulate level of 5.0 COH's or 625 ug/m³, and has no 12-hour average criteria. County Second Stage particulate levels are 6.0 COH's. With lower Second Stage criteria, a greater range between Second and Emergency Stage actions would be available for affecting curtailments and provide a greater margin of safety. The 12-hour criteria may traverse into and out the alert range rather rapidly and do not provide a stable and systematic basis on which to order curtailment actions and should therefore be eliminated.

1. (Continued)

Since health effects studies for determining episode criteria are based upon high volume data, the correct conversion factor to COH's should be applied in setting the COH alert criteria for each monitoring location.

2. Article XVIII should be revised to formalize the use of discretionary powers during episodes.

At the Emergency Stage, Article XVIII calls for the closing of schools, airports, commercial establishments and other sources deemed inappropriate in this episode. The Director must have discretionary power to affect only those curtailments necessary to prevent air quality from reaching harmful levels. Further, the use of judgment is essential in the proper conduct of the episode control program and should be formally reflected in the regulations. The Air Pollution Control Advisory Committee should make an immediate review of the actions listed in the regulations and provide guidance accordingly.

3. Instrumentation should be developed to record the high levels of pollution experienced during this episode.

EPA should provide guidance on running high volume samplers and on rapid response instruments, such as the tape sampler, so that very high levels of particulates can be obtained and reported. Presently, the high volume sampler is incapable of operating within the Federal criteria at elevated levels, and short term values do not meet the Federal guidelines. EPA should provide guidance on how to overcome this limitation and on procedures for reporting short duration runs.

3. (Continued)

In the interim, the Bureau is set up to run 8-hour Hi-Vol samples at Liberty Borough during future episodes.

4. Communication procedures during emergency episodes should be improved.

Periodic news conferences to inform the media of the air quality situation and status of the curtailment actions would alleviate the demands made by handling each inquiry on an individual basis. Bureau resources are best used for their intended purpose during emergencies and regular news conferences would allow this to a greater degree. Further, a review of all communication requirements should be made with the objective of eliminating any communication difficulties identified during the episode.

mdp

5/18/76

APPENDICES

- A. High Volume Data from Liberty Borough Monitoring Station
- B. Dan Amabile's Report
- C. Sources Contacted
- D. Hospitals Contacted
- E. Local News Media Contacted
- F. Bob Felt's Report
- G. Reports from Coke Oven Technicians
- H. U. S. Steel's Schedule for Resumption of Production
- I. Weather Reports
- J. Air Quality Data for Liberty Borough Monitoring Station
- K. Report on Monitoring Problems Experienced During the Episode

EPISODE HI-VOLUME SAMPLES

<u>Start</u>		<u>End</u>		<u>Ave. Flow</u>		<u>Equivalence</u>
<u>Date</u>	<u>Hour</u>	<u>Date</u>	<u>Hour</u>	<u>Ft.³/Min.</u>	<u>µg/m³</u>	<u>µg/m³ per COH</u>
Nov. 17	0:30	Nov. 18	0:45	44.9	463	87
18	0:00	19	0:30	39.5	569	81
19	0:00	19	15:00	32.4	929	111
19	15:50	19	23:30	48.9	458	74
20	0:15	20	7:15	58.0	408	65
20	8:20	20	16:50	48.3	196	68
20	16:20	21	0:00	45.0	63	81

EPA recommended criteria for acceptable data require average flow rates to be between 40 and 60 Ft.³/Min. and a duration of between 23 and 25 hours.

ZERO & SPAN CRITERIA CHECKS

Pennington Hills
D.T. Bell
DL

STATION Liberty Borough

DATE November 19, 1975 TECHNICIAN Dante E. Amabile

SO₂ CALIBRATION VALUE _____

SO₂ (ZERO)

SO₂ (SPAN)

15

18

21

33

36

39

CO CALIBRATION VALUE _____

CO (ZERO)

CO (SPAN)

REVIEWED

NOV 20 1975

SENSOR, ETC. Primary Fine Particulates

Alleg. County Health
Bureau of Air Pollution Control

REMARKS At 01:00 on this date I was called to attend and service the particulate monitor at the Liberty Boro Station as it was in alarm.

Upon arriving at the station at (03:00) I found that the subject monitor was not in alarm but the readings were at maximum scale on the chart recorder. The back-up particulate monitor was lagging by two or three COH's. Observation of the 03:00 to 04:00 readings was a duplication and verifies this statement.

The primary particulate monitor was calibrated with a .2 neutral density filter and readings were: 2.74 (adjusted to 2.50) on the output, 2.46 (adjusted to 2.40). On the orange pot (telemetry circuit), 5.05 (adjusted to 5.0) on the 0-100 MV or chart circuit.

It was difficult to find my way to the station, but upon leaving at 4:40 visibility was 0 to 5 ft. and I became completely lost. Being familiar with the area I still asked for direction from a pedestrian and eventually found my way, at 5mph; to the County Airport

WGP:cdk at 05:30.
11/17/75

INDUSTRIES ORDERED TO CURTAIL OPERATIONS DURING NOVEMBER EPISODE

1) United States Steel Corporation

Clairton Works
Irvin Works
National Works
Duquesne Works
Edgar Thomson Works
Homestead Works

2) PICCO (Hercules, Inc.)

Clairton
West Elizabeth

3) Clairton Slag

4) Combustion Engineering

5) Duquesne Light

Elrama
Brunot Island

- 6) Trumbull - West Mifflin
- 7) Bucyrus-Erie
- 8) Duquesne Slag Products
- 9) Gateway Asphalt
- 10) Fort Pitt Steel Casting
- 11) Westinghouse - East Pittsburgh
- 12) Mesta Machine
- 13) B&O Railroad
- 14) Allegheny County Steam Heating
- 15) Jones & Laughlin Steel Corporation
- 16) Abrasive Metals
- 17) Bellefield Boiler
- 18) Pittsburgh Brewing
- 19) McConway-Torley
- 20) Exxon (Humble Oil)
- 21) Pittsburgh Brass Manufacturing Company
- 22) Continental Trailways
- 23) Hanlon-Gregory
- 24) City of Pittsburgh Asphalt Plant
- 25) Pittsburgh & Lake Erie Railroad
- 26) H. J. Heinz

HOSPITALS CONTACTED DURING NOVEMBER EPISODE

- 1) McKeesport
- 2) Presbyterian University
- 3) Braddock General
- 4) Children's
- 5) Columbia
- 6) Homestead
- 7) Magee Women's
- 8) Mercy
- 9) Montefiore
- 10) St. Francis
- 11) Shadyside
- 12) Western Pennsylvania

*W. J. ...
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...*

NEWS MEDIA CONTACTED DURING NOVEMBER 1975 EPISODE

1. Pittsburgh Post-Gazette
2. Pittsburgh Press
3. Associated Press
4. United Press International
5. KDKA TV
6. KDIA Radio
7. WIIC TV
8. WTAE TV & Radio
9. KQV Radio
10. WWSW Radio

INTER-DEPARTMENTAL CORRESPONDENCE

DATE November 21, 1975

ATTENTION OF J. D. Graham

FROM R. L. Felt *RAF*

SUBJECT: U.S. STEEL - BOILER FIRING DURING AIR ALERT EMERGENCY ON NOVEMBER 19, 1975

Between 7 p.m. on November 19, 1975 and 1 a.m. on November 20, 1975, I visited the following U.S. Steel plants to check the boilers in operation and the fuels being burned. It was found that each plant had discontinued the use of coal as a fuel and was burning either blast furnace gas, mixed gas, coke oven gas or oil.

<u>Time</u>	<u>Works</u>	<u>Boilers</u>	<u>Fuel</u>
7:00 p.m.	Homestead		Not Equipped to Burn Coal
7:35 p.m.	Carrie	#3 Power House	
		#3	Blast Furnace Gas
		#4	" " "
		Turbo Boiler House	
		#6	Blast Furnace Gas
		#12	" " "
8:30 p.m.	Edgar Thomson	Riley Boilers	
		#1	Blast Furnace Gas
		#2	" " "
		#3	Not Operating
9:10 p.m.	Duquesne	#15	Oil & Mixed Gas
		#17	" " "
9:55 p.m.	National	#1	Blast Furnace Gas
		#2	" " "
		#3	" " "
		#4	Not Operating
		#5	" "
11:35 p.m.	Clairton	Benzene Boiler House	
		#13 - Riley	Oil
		#14 - Kiley	"

<u>Time</u>	<u>Works</u>	<u>Boilers</u>	<u>Fuel</u>
11:35 p.m.	Clairton (Cont'd.)	#2 Boiler House	
		#1* - Cyclone	Coke Oven Gas
		#2*	" " "
		#3*	" " "
		#4*	" " "

* Minimum amount (less than 5%) of coal burned constantly to prevent flame from going out.

12:25 a.m.	Irvin	#3	Coke Oven Gas
		#4	" " "
		#5	Down for Repairs
		#6	" " "
		#7	Coke Oven Gas

In each case where coal could have been burned, the feeders and grates were clean, and the charts recording fuel usage indicated no coal having been used.

U.S. Steel had cleared entry for me at each plant and I was escorted to the boiler houses by either plant protection supervision or turn foremen. At Homestead and Clairton, Mr. R. McCarthy and Mr. Paul Morrison, who are in charge of environmental control for each of these plants, escorted me.

RLF/nh

cc: R. Chleboski
R. Westman

TO: R. C. Westman
 FROM: D. J. Janocko *DJ*
 DATE: December 24, 1975
 SUBJECT: PRODUCTION RATE OBSERVATIONS AT CLAIRTON COKE WORKS NOVEMBER 20, 1975

On November 20, 1975, I observed quenches from #5, #6, #7 and #8 towers at Clairton. My observations started at 12:54 a.m. and continued until 4:30 on #5 and #7 towers when fog limited my visibility. At that time I shifted my observation location and continued my observations of #6 and #8 towers. I continued these observations until 6:10.

The Clairton Works was supposed to be operating on a uniform 48 hour coking time. On this basis one would expect to see 3.8 quenches per hour from #5 tower which services 183 ovens, 3 quenches per hour from #6 tower which services at that time 153 ovens (one-half of #16 battery down for rehabilitation), and 3.6 quenches per hour from both #7 and #8 towers each servicing 174 ovens.

The hourly breakdown of the quenches observed follows:

Hour	Quenches #5 Tower	Quenches #7 Tower	Quenches #6 Tower	Quenches #8 Tower
12:54-1:53	4	5	4	4
1:54-2:53	4	3	5	5
2:54-3:53	2	5	4	4
3:54-4:53	0*	2	1*	4
4:54-5:53	--	4	--	2
Total:	10	19	14	19
Ave./Hr.:	$\frac{10}{3.5} = 2.9$	$\frac{19}{5} = 3.8$	$\frac{14}{3.5} = 4$	$\frac{19}{5} = 3.8$

* Observed one-half hour, until 4:23

Though some of the hourly figures were over the respective limits #5 tower was under the expected hourly average, #7 and #8 were marginally over, 3.8 per hour versus 3.6 allowed. Tower #6, however, was quenching 4 per hour which is above the rate adjusted for rehabilitation of 3 per hour and marginally above the rate if all ovens were operating of 3.8 per hour.

DJJ/nh

TO: R. C. Westman
FROM: R. L. Hoffman
DATE: December 10, 1975
SUBJECT: PUSHING OBSERVATIONS DURING ALERT THE WEEK OF NOVEMBER 17-21, 1975

On Monday morning, November 17, 1975, I was dispatched by you to observe quenching rates at the Clairton Coke Works. The observations were to determine compliance to assigned coking times at the plant. All off-premises observations were made from the Glassport-Elizabeth Road directly across from the coke works.

On Monday, Denis Zielinski and I observed the plant from 10:00 a.m. to 4:00 p.m. and saw a total of 302 quenches plant-wide. This is an average of 50 pushes per hour plant-wide. During the observations, the plant was supposed to be on a 24 hour coking cycle. This calls for 458 pushes per turn or an hourly plant average of 57 pushes per hour. Clairton was well within hourly average limits during this observation.

On November 18, 1975, Denis Zielinski and I observed the plant from 9:00 a.m. to 4:00 p.m. We saw a total of 334 quenches. This is an average of 48 pushes per hour plant-wide. Again, the assigned coking time was 24 hours, so Clairton was well within the hourly plant-wide maximum average of 57 pushes per hour.

On November 19, 1975, I observed the plant from 1:00 p.m. to 4:00 p.m. No readings could be made before 1:00 p.m. due to a very dense fog in the area around the plant. During the three hour observation the plant was on an assigned coking time of 28 hours. The maximum allowable plant-wide average of pushes per hour is 49 on 28 hour coking time. Clairton was averaging 43 pushes per hour plant-wide. Again, Clairton was well within the maximum limits.

On November 20, 1975, I observed quenching on units 1, 3, 4 and 12A inside the plant from 12:00 midnight to 8:00 a.m. Clairton was on a 48 hour coking cycle during this time. I observed 49 quenches during this period. All observations were made from the roadway in front of the Battery Foreman's office on batteries 7-12A. The data was collected by EPA after we finished so any averages for the plant during this time should be obtained from them. John Heppola was the man from EPA who was in charge of the observations. After I finished in the plant, I began another observation from the outside of the plant. This time the plant was observed from 12:00 noon to 4:00 p.m. During this time I observed a total of 142 quenches. This is an average of 35 quenches per hour plant-wide. The maximum allowable average is 33 quenches per hour plant-wide on 42 hour coking time. This average is higher than allowed, but since it is only for four hours it cannot be determined whether or not they exceeded that average for the entire turn. No data was available for the morning due to fog conditions. The maximum number of pushes allowed on 42 hour coking time for a turn is 262 pushes.

INTER-DEPARTMENTAL
CORRESPONDENCEDATE December 1, 1975ATTENTION OF Roger Westman FROM George A. ManownSUBJECT ALERT EPISODE NOVEMBER 16, 1975 THRU NOVEMBER 21, 1975,
AT U S STEEL CLAIRTON WORKS

On November 19, 1975, I contacted Bill Snee of U. S. Steel Corporation at Clairton Works to obtain production rate schedules of the coke works. I did this in relation to the Emergency Stage Alert going on concurrently with this request. The purpose of this request was to determine if the Clairton Coke Works were in fact meeting the curtailment schedule so ordered by the Bureau. Normally, this type of information is acquired by making production rate observations. In essence, counting quenches coming from the eight quench towers in the coke works. However, during the week of November 19, 1975, this was not possible due to the heavy fog and/or smog which literally "socked in the plant". Therefore, with visibility at zero, and there being a need to know production schedules I requested the attached information.

On November 20, 1975, I again requested the same information. At this time the Clairton Works was to have been cut back to 48 hours coking since 12:00 midnight. Bill Snee was cooperative and provided the information needed, (also attached). I went one step further in that I went on 13 out of 15 pusher machines to acquire the same information, however, this information came directly from the pusher machine operators report sheets found on the pushers. I talked to each unit foreman and the information acquired substantiated the information acquired from Mr. Snee. (Field Notes of this attached.)

I further requested from Mr. Snee the schedules through the period which ended midnight November 21, 1975, at which time the coke works was to be back on normal operating schedule. I received these November 26, 1975.

Attached are the production rate schedules being met by U. S. Steel at the Clairton Coke Works (which are signed by W. E. Snee) and my field notes on information acquired from the pusher machine operators reports. If you have any questions regarding these documents we can contact Mr. Snee at the Clairton Works.

GAM/cg

Attachements

cc: R. J. Chleboski
J. D. Graham
EPA Region III
Coke Oven Process Technicians

During the Alert, no reading could be made during the early morning hours due to fog conditions in the area. As soon as the fog cleared observations were started. On Wednesday, November 19, 1975, I observed charging off-the-main on batteries 10, 12 and 12A. This caused dense clouds of smoke to be formed. It seems strange to me that the plant should cut back their pushing schedule to curtail emissions and then charge ovens in the air. This tends to defeat the purpose of schedule reductions. During this time a strange odor was found to be coming from the plant. It smelled like rotten sauerkraut. This odor is exactly the same kind that comes from any paper plant making kraft paper products. I noticed the odor before the Alert and many times since, but it was extremely strong at times during my observations. The number of green pushes observed also decreased as the coking time increased. From my observation position on the river road I also noticed an unusually high amount of particulates in the area. It was almost like being inside the plant. Also, the coke works was required to wet seal each door that leaked during the 48 hour coking time. It is my opinion that their manpower could be put to better use by cleaning goosenecks before charges or cleaning doors and jambs rather than spraying doors. It is possible that if enough silica was on a door it might retain enough heat to warp the diaphragms on the doors. It could possibly have done more harm than good.

RLH/nh

INTER-DEPARTMENTAL CORRESPONDENCE

DATE November 26, 1975

ATTENTION OF R. C. Westman

FROM D. M. Zielinski *DMZ*

SUBJECT: PRODUCTION RATE AT J&L (HAZELWOOD) ON NOVEMBER 20, 1975

On November 20, 1975, J&L was ordered to cut production from 18 to 24 hour coking time due to a First Stage Alert. On that day I was stationed for six (6) hours, between 9:15 a.m. to 3:15 p.m., watching the production rate, and found them not to be in compliance.

Since J&L has a total of 315 ovens, and to be on a 24 hour coking schedule 315 ovens could be pushed in a 24 hour period. For the six (6) hours I observed, J&L was allowed 78.7 quenches, I found them to have 82. The hourly figures are as follows and the data collected is attached.

	<u>P-1</u>	<u>P-4</u>	<u>Total</u>
1st hr.	7	9	16
2nd hr.	7	6	13
3rd hr.	4	8	12
4th hr.	5	8	13
5th hr.	5	10	15
6th hr.	7	6	<u>13</u>
			82

DMZ/nh
Attachment

ALLEGHENY COUNTY
HEALTH DEPARTMENT

INTER-DEPARTMENTAL CORRESPONDENCE

DATE December 1, 1975

ATTENTION OF Roger Westman FROM George A. Manown *GAM*

SUBJECT ALERT AT J&L HAZELWOOD, NOVEMBER 16 THRU NOVEMBER 20, 1975.

On November 19, 1975, I requested production rate schedules from Jim Saunders, J&L Environmental Engineer at Pittsburgh Coke Works, Hazelwood.

Mr. Saunders provided all requested information for November 19, 20, and 21, 1975. According to Mr. Saunders signed figures, the Coke Works did in fact meet the required 104.8 oven schedule based on 24-hour coking time for 315 ovens. These figures were extracted from the General Formans', George Kiffer, Production Log Book. These figures were signed by Jim Saunders to be the actual number of pushes made during this period.

GAM/cg

- cc: R. J. Chleboski
- J. D. Graham
- EPA Region III
- Coke Oven Process Technicians

PROPOSED SCHEDULE FOR INCREASING COKE PRODUCTION AT CLAIRTON COKE WORKS
AS RECEIVED FROM MR. WILLIAM FADER AT 1:00 P.M., NOVEMBER 20, 1975

<u>Date</u>	<u>Time</u>	<u>Coking Time</u>
11/20/75	9:00 A.M.	48 hours
"	12:00 noon	42 "
"	8:00 P.M.	36 "
	12:00 Midnight (Gas taken off boilers, resume coal-firing)	
11/21/75	8:00 A.M.	28 "
"	4:00 P.M.	24 "
"	12:00 Midnight (Normal coking time 17 - 18 hours	

Clear
15 mi
1410
5390
W-9

DeNardo & McFarland
Weather Services, Inc.
Allegheny County Airport
West Mifflin, Pennsylvania

Atmospheric Analysis Form Designed Specifically For
ALLEGHENY COUNTY
BUREAU OF AIR POLLUTION CONTROL

TODAY:

Grd. Inv. Strength 0 °C Top MSL Bk. Time/Temp. E/ °F
Upper Inv. Strength 3.2 °C Base 3400 MSL Top 4800 Bk Time/Temp WNE E/ °F

TOMORROW:

Grd. Inv. Strength 3.5 °C Top 1800 MSL Bk. Time/Temp 1000 E/ 51 °F
Upper Inv. Strength 0 °C Base MSL Top MSL Bk Time/Temp E/ °F

Air Pollution Index: Forecast Today 51 Forecast Tonight 55

- A. Begin HAPPW as of EST Date HAPPW is forecasted for a hour period.
- B. Alert Stage I Levels (will) will not be reached during the next 12 - 24 hour period.
- C. REMARKS

PIF Weather Data Phone Count 8520

	AFTERNOON		TOMORROW	
	Fcst.	Act.	Fcst.	Act.
Average Wind < 4.0	W 7.0	W 5.2	WSW 6.0	W 6
Mixing Depth	900	880	900	890
Ventilation Rate	6300	5490	5400	5340
Surface Wind (m/sec - 13E - 20E)	SW 5.0	W 4.4	SSW 4.0	SW 3.4

DATE Sun Nov 16, 1945
TIME

ISSUED BY
RECEIVED BY

We will issue a High Wind Forecast (15 MPH or greater) to the Bureau, if the Surface to 1000' wind is forecasted for 24 hours or longer, during the period of November 1 to May 1 (it should be called as if an High Air Pollution Alert).

Clear
 10 mi.
 49°
 63%
 W - W

DeNardo & McFarland
 Weather Services, Inc.
 Allegheny County Airport
 West Mifflin, Pennsylvania

Atmospheric Analysis Form Designed Specifically For
 ALLEGHENY COUNTY
 BUREAU OF AIR POLLUTION CONTROL

TODAY: 4.8 1300
 Grd. Inv. Strength °C Top MSL Bk. Time/Temp. 1100 EI 52 OF
 Upper Inv. Strength 2.0 °C Base 3400 MSL Top 4800 Time/Temp 1018 EI OF

TOMORROW: 6.0 1500
 Grd. Inv. Strength °C Top MSL Bk. Time/Temp. 1100 EI 56 OF
 Upper Inv. Strength 1.0 °C Base 3300 MSL Top 4400 Time/Temp 1530 EI 67°F

Air Pollution Index: Forecast Today 28 Forecast Tonight 28

- A. Begin HAPPAW as of 21:00 EST 11/15/75 Date. HAPPAW is forecasted for a 3 1/2 + hour period. *have been*
- B. Alert Stage I Levels will not be reached during the next 12 - 24 hour period. *Darkwood - 5 am this morning. Liberty Blvd - 10 pm on 11-15-75*
- C. REMARKS

Downtown close to Alert I on Carbon Monoxide will come down after 11 am.
 P11 Weather Data Phone Count 8587

AFTERNOON:		TOMORROW	
Fcst.	Act.	Fcst.	Act.
W 4.0	16.1	W 5.0	W 4.1
940	596	10100	1010
3760	5340	5300	4141
SW 3.5	SW 3.4	SW 4.0	SW 2.5

Average Wind < 4.0
 Mixing Depth
 Ventilation Rate
 Surface Wind (m/sec - 13E - 20E)
 DATE *Nov 15 1975*
 TIME *10:45*

ISSUED BY *Jay*
 RECEIVED BY *Jay*

We will issue a High Wind Forecast (15 MPH or greater) to the Bureau, if the Surface to 1000' wind is forecasted for 24 hours or longer, during the period of November 1 to May 1 (it should be called as if an High Air Pollution Alert).

Clear
 to mi : Stage
 480
 6670
 SSW - 5

DeNardo & McFarland
 Weather Services, Inc.
 Allegheny County Airport
 West Mifflin, Pennsylvania

Atmospheric Analysis Form Designed Specifically For
 ALLEGHENY COUNTY
 BUREAU OF AIR POLLUTION CONTROL

TODAY: 8.8 1400
 Grd. Inv. Strength 8.8 °C Top 1400 MSL Bk. Time/Temp. 1115 EI 56 °F
 Upper Inv. Strength 1 °C Base 1300 MSL Top 1500 Bk Time/Temp. 1113 EI 67 °F

TOMORROW:
 Grd. Inv. Strength 7 °C Top 1500 MSL Bk. Time/Temp. 1130 EI 59 °F
 Upper Inv. Strength 2 °C Base 5000 MSL Top 5500 MSL Bk Time/Temp. 1113 EI 75 °F

Air Pollution Index: Forecast Today 116 Forecast Tonight 105
Recommend continue

- A. Begin HAPPW as of EST Date HAPPW is forecasted for a 36 hour period.
- B. Alert Stage I Levels will ~~not~~ be ^{maintained} ~~resisted~~ during the next 1 - 24 hour period. at Liberty Boro, W. Braddock, Hazelwood
- C. REMARKS Liberty Boro will be in Alert Stage II for 12-24 hrs. and fine particulate and product for 4-5 hrs.

PIT Weather *early afternoon*: Data Phone Count 8701
 No change in weather over next 48 hrs. AFTERNOON TOMORROW

Average Wind < 4.0
 Mixing Depth
 Ventilation Rate
 Surface Wind (m/sec - 13E - °OE)

	Fcst.	Act.	Fcst.	Act.
SW 3	1041	1041	SW 4	1041
	1140	1010		860
	3420	4111		4012
	SW 3	108023	SW 4	55018

DATE *Nov 15, 1975*
 TIME *11:10*

ISSUED BY *[Signature]*
 RECEIVED BY *Harvey*

We will issue a High Wind Forecast (15 MPH or greater) to the Bureau, if the Surface to 1000' wind is forecasted for 24 hours or longer, during the period of November 1 to May 1 (it should be called as if an High Air Pollution Alert).

Clear
1 mi ground
460
70%
ESE - 2

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 West Mifflin, Pennsylvania

Atmospheric Analysis Form Designed Specifically For
 ALLEGHENY COUNTY
 BUREAU OF AIR POLLUTION CONTROL

TODAY: Grd. Inv. Strength *5.6* °C Top *1100* MSL Bk. Time/Temp. *11:15* E/ *53* °F
 Upper Inv. Strength *0* °C Base _____ MSL Top _____ Bk Time/Temp _____ E/ _____ °F

TOMORROW: Grd. Inv. Strength *5.3* °C Top *1100* MSL Bk. Time/Temp. *11:15* E/ *57* °F
 Upper Inv. Strength *0* °C Base _____ MSL Top _____ MSL Bk Time/Temp _____ E/ _____ °F

Air Pollution Index: Forecast Today *117* Forecast Tonight *110*

A. ^{*Continue*} ~~Begin~~ HAPPAW as of _____ EST _____ Date. HAPPAW _____ is forecasted for a *36* hour period.

B. Alert Stage I Levels will - will not be reached during the next 12 - 24 hour period. *Liberty Zone will maintain D1 for 24 hrs*

C. REMARKS *Expect ~~Alert~~ ~~Stage I~~ to reach Alert I by 10:00*
Downtown, Hazelwood, N. Braddock - remain in Alert II for 24 hrs.

PIF Weather _____ Data Phone Count *8917*

Liberty Zone has reached emergency - D11 forecast - 193

AFTERNOON		TOMORROW	
Est.	Act.	Fcst.	Act.

Average Wind *4.0*

Mixing Depth

Ventilation Rate

Surface Wind (m/sec - 13E - 20E)

<i>52.0</i>	<i>50.47</i>	<i>55E3</i>	<i>51C8</i>
<i>900</i>	<i>8100</i>	<i>900</i>	<i>790</i>
<i>2250</i>	<i>4013</i>	<i>2700</i>	<i>3532</i>
<i>SE2</i>	<i>554.8</i>	<i>SE3</i>	<i>50.0</i>

DATE *Wed. Nov. 12, 1975*

ISSUED BY *Rich*

TIME *11:10*

RECEIVED BY *Henry*

We will issue a High Wind Forecast (15 MPH or greater) to the Bureau, if the Surface to 1000' wind is forecasted for 4 hours or longer, during the period of November 1 to May 1 (it should be called as if an High Air Pollution Alert).

Clear
10 mi
490
5490
SSE-8

DeNardo & McFarland
Weather Services, Inc.
Allegheny County Airport
West Mifflin, Pennsylvania

Atmospheric Analysis Form Designed Specifically For
ALLEGHENY COUNTY
BUREAU OF AIR POLLUTION CONTROL

TODAY: 9.4 1600
Grd. Inv. Strength 0°C Top MSL Bk. Time/Temp. 12:30/62 °F
Upper Inv. Strength 0°C Base MSL Top Bk Time/Temp E/ °F

TOMORROW:
Grd. Inv. Strength 0°C Top MSL Bk. Time/Temp. E/ °F
Upper Inv. Strength 0°C Base MSL Top MSL Bk Time/Temp E/ °F

Air Pollution Index: Forecast Today 136 Forecast Tonight 102

- A. Begin HAPPW as of EST Date. HAPPW is forecasted for a hour period.
- B. Alert Stage I Levels will - will not be reached during the next 12 - 24 hour period. Alert Stage I Reached at I-B- 9 pm - Nov 18
- C. REMARKS Emergency Stage Reached at Liberty Blvd - 2:30 pm on Nov 19, Alert I Reached at Naylwood - 3 am on Nov 18, Alert I Stage

PIT Weather Data Phone Count 9344

Reached at N. Quaddack and Downtown - 10 pm on Nov 18

AFTERNOON TOMORROW
Fcst. Act Fcst. Act.

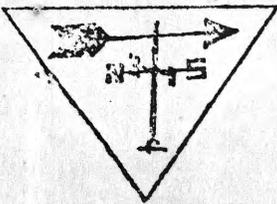
Average Wind < 4.0
Mixing Depth
Ventilation Rate
Surface Wind (m/sec - 13E - 20E)

SSW 10.0	SSW 8.5	W 11.0	W 14.75
730	790	1000	1530
7300	8532	11,000	22,528
5.6.0	5.0.0	W 7.0	W 10.4

DATE 20 Nov 20, 1975
TIME 11:10

ISSUED BY Ray
RECEIVED BY Ray

We will issue a High Wind Forecast (15 MPH or greater) to the Bureau, if the Surface to 1000' wind is forecasted for 24 hours or longer, during the period of November 1 to May 1 (it should be called as if an High Air Pollution Alert).



DeNARDO & McFARLAND

Weather Services, Inc.

ALLEGHENY COUNTY AIRPORT

WEST MIFFLIN, PENNSYLVANIA 15122

462-6464

469-0950

(Code No. 412)

May 12, 1976

Mr. Ronald Chleboski
Deputy Director
Air Pollution Control Bureau
Allegheny County Health Department
301 39th Street
Building No. 7
Pittsburgh, Pennsylvania 15201

Dear Ron:

Following our telephone conversation of May 10, 1976 regarding the cancellation of the emergency stage alert at the Liberty Borough monitor at 2:00 PM on November 20th.

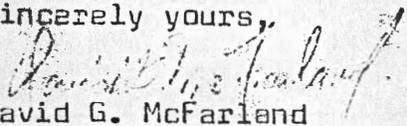
I have talked with the two forecasters on duty that morning, Ray Rasmussen and Stan Bostjancic and to the best of their knowledge, this is what happened: The morning inversion strength was 9.0°C, it was forecast to break at 1230 EST when a surface temperature of 62°F was reached. The forecast ventilation rate for the afternoon of November 20th was 7300 m²/sec. The forecast for the 21st was for a cold front to pass by early morning with no morning inversion and afternoon ventilation of 11,000 m²/sec or more. (your records will show this information). The forecast therefore, was very definitely for improving meteorology. However, the criteria we have established for ending a High Air Pollution Watch is that afternoon ventilation following inversion breakup must be 8000 m²/sec. The duty forecaster felt that we should not recommend the Watch be canceled until we were sure the 8000 ventilation rate would occur. Accordingly, he did not recommend the Watch be canceled at 1050 EST when the atmospheric analysis report was called into Nancy Hamilton. At 1315 EST Ray Rasmussen received a call from Roger Westman who told him the "Bureau" had decided that on the basis of our forecast and current air quality at Liberty Borough, to

Mr. Ronald Chleboski
Air Pollution Control Bureau
May 12, 1976

continue the Emergency Watch conditions, in the Liberty Borough area. At 1400 EST Stan Bostjancic received a call from Roger who informed him that the "Bureau" had decided that on the basis of 2:00 PM air quality readings at Liberty Borough, they would cancel the Emergency Watch at Liberty Borough, but continue Alert Stage I conditions. Stan Bostjancic said that on the basis of the 2:00 PM Pittsburgh temperature and wind data he was sure we would have a 8000 m²/sec. afternoon ventilation rate and that the forecast of rain showers were still on schedule and that the Bureau could cancel the whole watch if they wanted to. Roger said No, they were only going to drop the Emergency Watch conditions but because of pressure from the EPA team, they would continue Alert Stage I conditions.

In summary: The DeNardo and McFarland weather forecast at 1030 EST was for slow but steadily improving meteorological conditions beginning after inversion breakup at 1230 EST. We were not sure at that time, if the afternoon ventilation would reach 8000 m²/sec. but we were sure a cold front with accompanying rain showers would completely end the stagnation by 10:00 PM. By 2:00 PM, we were sure the ventilation would exceed 8000 m²/sec. and concurred with the Bureau's decision to cancel the emergency watch conditions in the Liberty Borough area.

Sincerely yours,



David G. McFarland
Chief Meteorologist

DGM/ks

LIBERTY BOROUGH MONITORING STATION

APPENDIX J

<u>NOVEMBER</u>	<u>HOUR</u>	<u>HOURLY COH</u>	<u>12 HOUR AVE</u>	<u>24 HOUR AVE</u>
16	1	4.71	3.76	2.27
	2	7.76	4.29	2.57
	3	5.57	4.63	2.79
	4	5.65	5.03	3.01
	5	3.88	5.24	3.15
	6	4.76	5.37	3.32
	7	1.86	5.13	3.37
	8	3.34	5.02	3.45
	9	1.25	4.68	3.44
	10	0.67	4.30	3.43
	11	0.71	3.81	3.44
	12	0.81	3.41	3.42
	13	0.64	3.08	3.42
	14	0.66	2.48	3.39
	15	0.63	2.07	3.35
	16	0.72	1.66	3.35
	17	0.79	1.40	3.32
	18	0.77	1.07	3.22
	19	0.91	0.99	3.06
	20	6.34	1.24	3.13
	21	7.03	1.72	3.20
	22	7.46	2.29	3.29
	23	9.93	3.06	3.43
	24	7.85	3.64	3.53
17	1	8.27	4.28	3.68
	2	9.02	4.98	3.73
	3	5.14	5.35	3.71
	4	6.37	5.82	3.74
	5	7.84	6.41	3.91
	6	7.93	7.01	4.04
	7	10.13	7.78	4.38
	8	7.39	7.86	4.55
	9	7.04	7.86	4.79
	10	6.67	7.80	5.04
	11	6.30	7.50	5.28
	12	4.00	7.17	5.41
	13	1.95	6.65	5.46
	14	1.33	6.01	5.49
	15	0.76	5.64	5.50
	16	0.85	5.18	5.50
	17	0.58	4.58	5.49
	18	0.58	3.97	5.49
	19	0.71	3.18	5.48
	20	0.71	2.62	5.24
	21	8.33	2.73	5.30
	22	9.81	2.99	5.40
	23	9.48	3.26	5.38
	24	6.86	3.50	5.34

RCW:smw
5/18/76

LIBERTY BOROUGH MONITORING STATION

<u>NOVEMBER</u>	<u>HOUR</u>	<u>HOURLY COH</u>	<u>12 HOUR AVE</u>	<u>24 HOUR AVE</u>
18	1	6.98	3.92	5.28
	2	8.65	4.53	5.27
	3	6.80	5.03	5.34
	4	9.69	5.77	5.47
	5	7.88	6.37	5.48
	6	6.52 (10.51)	6.87 (7.20)	5.42 (5.58)
	7	7.22 (10.51)	7.41 (8.02)	5.30 (5.60)
	8	7.93 (10.51)	8.01 (8.83)	5.32 (5.73)
	9	10.85	8.22 (9.04)	5.48 (5.89)
	10	7.40 (10.51)	8.02 (9.10)	5.51 (6.05)
	11	10.11	8.07 (9.16)	5.67 (6.21)
	12	6.42	8.04 (9.12)	5.77 (6.31)
	13	3.25	7.73 (8.81)	5.82 (6.36)
	14	1.90	7.16 (8.25)	5.84 (6.39)
	15	0.91	6.67 (7.75)	5.8 (6.39)
	16	0.99	5.95 (7.03)	5.8 (6.40)
	17	0.93	5.37 (6.45)	5.8 (6.41)
	18	0.92	4.90 (5.65)	5.89 (6.43)
	19	1.16	4.40 (4.87)	5.90 (6.44)
	20	6.40	4.27 (4.53)	6.14 (6.68)
	21	6.76 (10.51)	3.93 (4.50)	6.08 (6.77)
	22	7.65 (10.51)	3.95 (4.50)	5.99 (6.80)
	23	7.98 (10.51)	3.77 (4.53)	5.92 (6.84)
	24	7.55 (10.51)	3.87 (4.88)	5.95 (7.00)

The value of 10.51 was used later to replace data from the secondary tape sampler for those hours when the primary tape sampler was reading off scale.

RCW:smw
5/18/76

LIBERTY BOROUGH MONITORING STATION

<u>NOVEMBER</u>	<u>HOUR</u>	<u>HOURLY COH</u>	<u>12 HOUR AVE</u>	<u>24 HOUR AVE</u>
19	1	8.32	4.29 (5.30)	6.01 (7.05)
	2	8.94	4.88 (5.88)	6.02 (7.06)
	3	6.89	5.37 (6.88)	6.02 (7.22)
	4	10.10	6.13 (7.48)	6.04 (7.25)
	5	6.17	6.57 (7.91)	5.97 (7.18)
	6	9.42	7.28 (8.62)	6.09 (7.14)
	7	10.47	8.05 (9.40)	6.23 (7.14)
	8	9.08	8.28 (9.62)	6.27 (7.08)
	9	8.64	8.43 (9.47)	6.18 (6.98)
	10	9.59 (10.51)	8.59 (9.47)	6.27 (6.98)
	11	10.51	9.47	7.00
	12	7.63	9.23	7.05
	13	5.49	8.99	7.14
	14	8.41	8.95	7.42
	15	1.16	8.17	7.43
	16	1.47	7.41	7.45
	17	1.73	7.04	7.48
	18	3.94	6.59	7.60
	19	2.06	5.89	7.64
	20	10.26	5.98	7.80
	21	8.32	5.96	7.71
	22	7.66	5.72	7.59
	23	8.29	5.54	7.50
	24	7.48	5.52	7.37

At 11:00 A.M. the value of 10.51 was used to replace data from the secondary tape sampler for those hours when the primary tape sampler was reading off scale.

RCW:smw
5/18/76

LIBERTY BOROUGH MONITORING STATION

<u>NOVEMBER</u>	<u>HOUR</u>	<u>HOURLY COH</u>	<u>12 HOUR AVE</u>	<u>24 HOUR AVE</u>
20	1	7.59	5.70	7.34
	2	6.30	5.52	7.23
	3	7.46	6.05	7.11
	4	5.37	6.37	6.89
	5	7.48	6.85	6.95
	6	4.55	6.90	6.74
	7	5.50	7.19	6.54
	8	6.67	6.89	6.44
	9	4.63	6.58	6.27
	10	5.30	6.39	6.05
	11	5.30	6.14	5.84
	12	4.14	5.86	5.69
	13	2.35	5.42	5.56
	14	1.25	5.00	5.26
	15	0.88	4.45	5.25
	16	0.82	4.07	5.22
	17	1.17	3.55	5.20
	18	0.75	3.23	5.07
	19	0.75	2.83	5.01
	20	0.95	2.36	4.62
	21	1.26	2.08	4.33
	22	0.66	1.69	4.04
	23	0.60	1.30	3.72
	24	0.48	0.99	3.43

RCW:smw
5/18/76

MONITORING PROBLEMS DURING THE EPISODEFine Particulate

Two tape samplers, a primary and a backup instrument, are used to measure fine particulate at the Liberty Borough station. The computer receives readings from both samplers and normally uses the data from the primary instrument for air quality reports. If the primary reading reached 11.0 Coh, the computer was programmed to take this as an indication of instrument malfunction. It then rejected the data automatically, and substituted instead the backup instrument value. This has been the practice since the telemetering system was installed. One reason for this practice is that a malfunction of the light source in the instrument causes readings to go off scale.

During the November episode this substitution happened repeatedly, not because of malfunction, but because the primary tape sampler went off scale. Although both instruments had received quarterly maintenance two weeks previously and had been checked again the week before the episode, the backup sampler gave readings about 2 Coh lower than the primary at high particulate levels. For that reason the automatic substitution of backup data resulted in lowered particulate values being calculated into the running averages when the primary sampler went off scale. This condition was aggravated further when the backup sampler developed a leak during the night between Tuesday the 19th and Wednesday the 20th.

The defect was repaired promptly on Wednesday morning. However, in order to stop reducing the particulate averages by the automatic substitution of lower backup sampler values the computer program was changed. In the new program when the primary tape sampler reading exceeds 10.50 Coh, the value 10.51 is recorded and used by the computer and no automatic substitution of backup sampler value takes place. Substitution is only performed after an investigation shows that the primary instrument is malfunctioning and not reading off scale.

The selection of the value 10.51 for off-scale readings was based on judgment. The developers of the tape sampler monitor and after them ASTM in method D 1704 and instrument manufacturers' caution against measuring spots where the accumulation of particulate has reduced light transmission through the spot by more than 50%. With denser spots the measurements are no longer linear, and their meaning becomes uncertain. For the Bureau's instruments, which sample 20 cubic feet of air per hour, 50% light transmission corresponds to a maximum reading of 8.21 Coh. Since the readings beyond this value have been found to be inaccurate, 10.51 Coh was chosen as an estimate for data exceeding this value.

The program change was put into effect at 11:00 a.m. on Wednesday, November 19. Since no off-scale readings were measured after 11:00 a.m. on November 19, the change had no effect on air quality readings during the remainder of the episode. All actions taken in regard to substitution of primary tape sampler data resulted in reported levels being increased so as to reflect the highest valid particulate measurement available.

Sulfur Dioxide

The sulfur dioxide monitor at Liberty Borough was recalibrated on November 18. The results indicated that the instrument had been reading approximately 40% high. The adjusted instrument was checked on November 24 by a monitoring team from the Human Effects Research Laboratory of EPA at Research Triangle Park. They found the new calibration to be 9% low which they considered to be within tolerance of their measurement accuracy.