

Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

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.

December 29, 1976

SURVEILLANCE REPORT

Hawkeye Chemical Company
Subsidiary of Skelly Oil Company
Clinton, Iowa

A. AMMONIUM NITRATE
AP-42 Section 6.8
Reference Number
20

An inspection tour was made of the Hawkeye Chemical Company, Clinton, Iowa, at 9:05 a.m. on December 7, 1976. This inspection was made by Darrell L. Lutton, Surveillance and Analysis Division, Environmental Protection Agency; Stephen P. Busch, Surveillance and Analysis Division, Environmental Protection Agency; and Robert M. Sayre, Iowa Department of Environmental Quality. The facility staff members contacted were M. M. White, Manager of Economic Analysis; William Moran, Chief Chemist; and Robert Wienert, Chief Process Engineer.

Process Description

The facility is engaged in the manufacture of nitrogen fertilizers, SIC code 2873. Processes at the facility are essentially unchanged since the last EPA inspection. The reader is referred to the Compliance Monitoring Inspection Report following the November 17, 1975, inspection for a process description and flow diagram.

Air Pollutant sources at the facility include three utility boilers, ammonia plant primary reformer, nitric acid plant, and various sources in the ammonium nitrate area. The three utility boilers are designated Numbers A, B, and C. Each of these boilers exhaust without controls through a separate stack. Available details of these boilers are as follows:

Boiler Number A

Manufacturer - Foster Wheeler Ltd.
Type - Package
Fuel - Natural gas
Maximum steam
output - 50,000 lb/hr (approx.)

Boiler Number B

Manufacturer - Foster Wheeler Ltd.
Type - Package
Fuel - Natural gas
Maximum steam
output - 50,000 lb/hr (approx.)

Boiler Number C

Manufacturer - Nebraska Boiler Company, Inc.
Type - Package
Fuel - Natural gas
Maximum steam output - 50,000 lb/hr (approx.)

The ammonia plant primary reformer utilizes natural gas and exhausts without controls. Tail gas from the nitric acid plant exhausts through a single stack following treatment by a catalytic purifier (catalytic combustor) in which a tail gas/natural gas mixture is ignited over a catalyst.

The various sources in the ammonium nitrate area include two evaporators, a neutralizer, prill tower, predryer, dryer, cooler, and two bulk loadouts. One ammonium nitrate evaporator is located at the solution plant; emissions are controlled by a wet impact separator incorporated into the basic design. The other ammonium nitrate evaporator is located at the prill tower. Emissions from this evaporator are controlled by a pad type mist eliminator. The ammonium nitrate neutralizer is also located at the prill tower. Emissions from this neutralizer are controlled by a combination wire mesh and high density pad mist eliminator.

Prill tower emissions are controlled by an air pollution control system installed since the previous EPA inspection. This system consists of a shroud extending below the spray nozzles to reduce particulate entrainment, a vertical wire mesh scrubber using a weak ammonium nitrate liquor, followed by a horizontal wire mesh mist eliminator. In addition, a melt cooler is used prior to the spray nozzles when high density prills are being made. The facility has performed stack tests with its own forces while manufacturing both low and high density prills. The results of these tests are as follows:

Low Density Prills

<u>Test Number</u>	<u>Date</u>	<u>Process Rate (ton/hr)</u>		<u>Discharge (lb/hr)</u>	<u>Isokinetic (%)</u>
3AB	1-20-76	10.7	0.25	2.63	+ 8.8
4AB	1-20-76	7.3	0.23	1.71	+13.4
5AB	1-21-76	8.8	0.93	8.19	+ 7.2
6ABCD	2-24-76	9.72	0.06	0.58	--
7ABCD	3-18-76	8.75	0.72	6.30	+ 8.7

High Density Prills

<u>Test Number</u>	<u>Date</u>	<u>Process Rate (ton/hr)</u>		<u>Discharge (lb/hr)</u>	<u>Isokinetic (%)</u>
10AB	8-9-76	12 1/2	0.99	12.4	+ 7.6
11AB	8-11-76	12 1/2	0.81	10.1	+ 0.6
12A	8-11-76	12 1/2	0.94	11.7	+ 4.9
13ABCD	8-25-76	12.52	2.17	27.12	- 2.8
14ABCD	8-26-76	14.24	1.46	20.85	- 6.5
15ABCD	8-31-76	15.13	0.13	1.99	- 4.9
16ABCD	8-31-76	15.13	1.80	27.28	- 3.3

Test Numbers 4AB, and 14 ABCD were observed by the Iowa Department of Environmental Quality personnel. Test Numbers 10AB, 11AB, and 12A were partial tests conducted for the facility's own purposes. Facility personnel attribute the poor results of test Number 13ABCD to erratic operation of the neutralizer with resultant varying feed concentrations to the prill tower.

The ammonium nitrate predryer is steam heated. Emissions from this predryer are controlled by an American Air Filter Company, Inc., Type W Rotoclone (wet dynamic precipitator) followed by a cyclone. The ammonium nitrate dryer is also steam heated. Emissions from this dryer are controlled by a separate American Air Filter Company, Inc., Type W Rotoclone (wet dynamic precipitator) followed by a cyclone. In addition, emissions from the ammonium nitrate cooler are controlled by a separate American Air Filter Company, Inc., type W Rotoclone (wet dynamic precipitator) followed by a cyclone.

One bulk ammonium nitrate loadout is used for rail cars while the other is used for trucks. Both loadout areas are covered. There are no air pollution control devices serving either loadout.

Materials collected by the various wet dynamic precipitators and cyclones are recycled.

Discussion of Compliance Status

The facility was in partial operation at the time of this inspection. Each of the utility boilers was fired with natural gas while producing steam at the following rates:

Boiler Number A	21,000 lb/hr
Boiler Number B	9,000 lb/hr
Boiler Number C	29,000 lb/hr

There were no visible particulate emissions from the utility boiler stacks.

The ammonia plant was operating at the rate of approximately 434 tons of ammonia per day. There were no visible particulate emissions from the primary reformer.

The nitric acid plant was operating at the rate of approximately 355 tons of nitric acid per day. There were visible particulate emissions from the tail gas stack. These emissions were light brown to dark yellow in color and estimated at 10 to 15 percent opacity. These visible emissions were in compliance with the applicable opacity regulation.

The ammonium nitrate evaporator at the solution plant and neutralizer at the prill tower were in operation. There were no visible particulate emissions from either source.

The remaining sources at the facility were not in operation to allow installation of the cyclones following the wet dynamic precipitators for the ammonium nitrate predryer, dryer, and cooler. The installation of these cyclones was substantially complete.

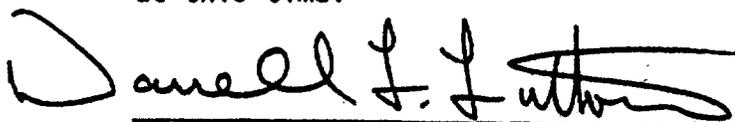
The facility provided copies of the ammonium nitrate prill tower stack test data. These data have been examined and the associated computations verified. This testing is inconclusive since additional testing at greater air flow rates will be required to determine compliance over the entire range of operating conditions. The facility intends to test at these greater air flow rates; however, cold weather has prevented attainment of necessary air flow rates.

Pending a determination of visible particulate emissions from the prill tower and evaluation of additional stack testing, the facility is considered of indeterminant compliance status regarding applicable regulations and the Order issued pursuant to Sec. 113(a)(1) of the Clean Air Act, as amended.

The Iowa Department of Environmental Quality considers the facility in compliance with applicable regulations pending the results of additional stack testing.

Recommendations

Additional stack tests will be evaluated and the facility reinspected while the prill tower is in operation. No further action is recommended at this time.


LUTTON, Sanitary Engineer


LONGSTON, Leader, Inspection Unit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Process Summary Sheet

Date December 29, 1976

I. Source Identification

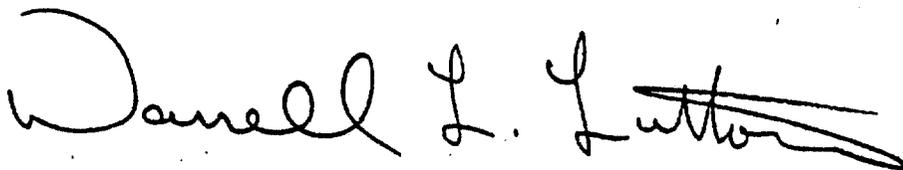
Hawkeye Chemical Company
Clinton, Iowa

II. Evaluator's Report

Iowa State Regulations apply.

Process or Source Identification	Utility boiler Number A	Utility boiler Number B	Utility boiler Number C	Ammonia plant, primary reformer
Applicable Regulations	4.3(2)b,d	4.3(2)b,d	4.3(2)b,d	4.3(2)a,d
Evaluated for Regulation	4.3(2)d	4.3(2)d	4.3(2)d	4.3(2)d
Date	12-7-76	12-7-76	12-7-76	12-7-76
Time From To	9:05-12:20	9:05-12:20	9:05-12:20	9:05-12:20
Operating	Yes	Yes	Yes	Yes
Control Device	None	None	None	None
Remarks:	No visible particulate emissions, in compliance during inspection	No visible particulate emissions, in compliance during inspection	No visible particulate emissions, in compliance during inspection	No visible particulate emissions, in compliance during inspection

Name of expert witness who can testify to the above:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Process Summary Sheet

Date December 29, 1976

I. Source Identification

Hawkeye Chemical Company
Clinton, Iowa

II. Evaluator's Report

Iowa State Regulations apply

Process or Source Identification	Nitric acid plant	Ammonium nitrate evaporator	Ammonium nitrate neutralizer	Ammonium nitrate evaporator at prill tower
Applicable Regulations	4.3(2)a,d	4.3(2)a,d	4.3(2)a,d	4.3(2)a,d
Evaluated for Regulation	4.3(2)d	4.3(2)d	4.3(2)d	
Date	12/7/76	12/7/76	12/7/76	12/7/76
Time From To	9:05-12:20	9:05-12:20	9:05-12:20	9:05-12:20
Operating	Yes	Yes	Yes	No
Control Device	Catalytic purifier	Wet impact separator	Mist eliminator	Mist eliminator
Remarks:	Visible particulate emissions, in compliance	No visible particulate emissions, in compliance	No visible particulate emissions, in compliance	

Name of expert witness who can testify to the above:

Daniel L. Lutton

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Process Summary Sheet

Date December 29, 1976

I. Source Identification

Hawkeye Chemical Company
Clinton, Iowa

II. Evaluator's Report

Iowa State Regulations apply.

Process or Source Identification	Ammonium nitrate prill tower	Ammonium nitrate predryer	Ammonium nitrate dryer	Ammonium nitrate cooler
Applicable Regulations	4.3(2)a,d	4.3(2)a,d	4.3(2)a,d	4.3(2)a,d
Evaluated for Regulation				
Date	12/7/76	12/7/76	12/7/76	12/7/76
Time From To	9:05-12:20	9:05-12:20	9:05-12:20	9:05-12:20
Operating	No	No	No	No
Control Device	Irrigated screens, mist eliminator	Wet dynamic precipitator, cyclone	Wet dynamic precipitator, cyclone	Wet dynamic precipitator, cyclone
Remarks:				

Name of expert witness who can testify to the above:

Daniel L. Futon

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Process Summary Sheet

Date December 29, 1976

I. Source Identification

Hawkeye Chemical Company
Clinton, Iowa

II. Evaluator's Report

Iowa State Regulations apply.

Process or Source Identification	Ammonium nitrate truck loadout	Ammonium nitrate rail car loadout		
Applicable Regulations	4.3(2)c	4.3(2)c		
Evaluated for Regulation				
Date	12/7/76	12/7/76		
Time From To	9:05-12:20	9:05-12:20		
Operating	No	No		
Control Device	None	None		
Remarks:				

Name of expert witness who can testify to the above:

Daniel L. Lutton