Dick Stoke
File - JC
Water Pollution

Monsanto

AUG 10 REC'D

Monsanto Company
Sauget, Illinois 62201
Phone: (618) 271-5835

August 10, 1971

Mr. Joe Burroughs
Emission Inventory Manager, Region 4
State of Illinois
Environmental Protection Agency
115A West Main Street
Collinsville, Illinois 62234

Dear Joe:

The attached Air Emissions Audit for the Monsanto W. G. Krummrich Plant represents the present emission level of our process and fuel combustion sources after termination of certain process operations last fall and the sale of the North Area of our plant this past spring.

As a help in the updating of your source operation data sheets for the W.G.K. plant, I have attached a list of all source operation data sheets sent to your Agency and indicated the one's that are no longer in operation.

If I can be of further help, please contact me.

Mike Foresman

M. R. Foresman

dy
attach.
ce: A. Telford

0736998

Source Operations

Form B No.	Number and Name of Source Operation	Operations Source (Status 7/8/71)
1	223A-Sodium Benzene Sulfonate Concentrator	Terminated
2	223B-Caustic Fusion Reactors	"
3	223C-#13 & 14 Fusion Pots	"
4	223D-#15 & 16 Fusion Pots	"
5	223E-Santosite Evaporator	"
6	223F-Santosite Drying	"
7	233G-Santosite Bagging & Bulk Loading	"
8	223H-Salt Cake Drying	"
9	223I-Salt Cake Bulk Loading	"
10	250A-#2 Phosphoric Acid Unit	"
11	250B-#3 Phosphoric Acid Unit	OK
12	215A-#8 Sulfuric Acid Unit	Terminated
13	215B-#9 Sulfuric Acid Unit	OK
14	210A-Dough Mixer	Terminated
15	210B-Continuous Dryer	"
16	210C-Exhaust Hoods and Spray Chamber	"
17	210D-Calciner	"
18	232 - North Salt Settler	OK
19	254 - Flaker Exhaust Hood	OK
20	258A - Lime Handling - Car Unloading	Sold to E. Cooper, Inc.
21	258B - Dihydroxy Diphenyl Sulfone Drying	" "
22	258C - Tray Drier Unloading Hopper	" "
23	258D - Hammer Mill	" "
24	275A - Filter Aid Unloading	" "
25	275B - Boric Acid Unloading	" "
26	275C - Filter Aid Pneumatic Conveyor	" "
27	275D - Boric Acid Pneumatic Conveyor	" "
28	222A - PNA Drying Classifying and Packing	OK
29	222B - ONA Flaking	"
30	236A - Pentachlorophenol Prilling	"
31	236B - Santobrite Drying	"
32	236C - Santobrite Milling and Packing	"
33	251 - ACl Compaction, Etc.	"
34	223K - Salt Cake Conveying	Terminated
35	262A - 2,4-D Process	"
36	262B - 2,4-D AcidBulk Handling	"
37	245 - Phosphorus Pentasulfide Process	OK
38	215C - Oleum Storage	"
39	262C - 2,4-D Acidification	Terminated
40	262D - 2,4-D Dissolver	"
41	262E - 2,4-D Truck Loading	"
	270A - Lime Unloading	Sold to E. Cooper, Inc.
	270B - Lime Conveying	"
	270C - Filter Aid Conveying	"
	258E - Filter Aid Conveying	"
	258F - Filter Aid Conveying	"
	232A - Bird Centrifuge Vent System	OK
	255 - 4-NDPA Reactor Vent Mis Eliminator	OK
	218 - Muriatic Acid Loading Scrubber	OK
	255A - K_2CO_3 Pneumatic Conveying	OK
	212A - Sulfur Dioxide Absorber	OK 0736999
	212B - Santosite Drying	OK
	212C - Santosite Bagging	OK
	212D - Santosite Bulk Handling	OK

PCB-ARCH0756339

Monsanto - W.G.Krummrich Plant

Air Emissions Audit

1971

Submitted to

Illinois Environmental Protection Agency

August 10, 1971

0737000

PCB-ARCH0756340

Monsanto - W. G. Krummrich Plant

Air Emissions Audit (1971)

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Prepared by:

Mike Foresman,
8/3/71

0737001

PCB-ARCH0756341

Definitions

Process Quantity - the total quantity of finished product and by product produced from a given process in pounds per year.

Process Weight Rate - the total input of raw materials to a process in pounds per hour.

Note: All process quantity and process weight rate figures are based on 24 hour per day, 360 day per year operations.

0737002

PCB-ARCH0756342

Dept. Nitrated Phenols

Process Quantity (#/hr.) - 7.3 $\bar{M}$

Process wt. rate (#/hr) - 2013.67 #/hr

Air Emissions - Hydrocarbons

Dept. Vents - 5 #/hr.

Air Emissions - Particulates

PNP flaking - flaking equip. & fan

Rate - 100 #/hr PNP

Operation time 15 hr/day

Inlet gas rate 80 SCFM

Stack ht 58 ft.

Measured emissions 0.14 #/hr

PNP drum loading

Rate 100 #/hr PNP

Operation time 24 hr/day

Inlet gas rate 250 SCFM

Stack ht 13 ft

Measured emissions 0.0 #/hr

0737003

PCB-ARCH0756343

Dept. Plasticizers

Process Quantity (#/yr.) - 69.1 M

Process wt. rate (#/hr.) - 13,090 #/hr.

Air Emissions - Hydrocarbons
Storage Tanks - 3 #/hr.

Scrubber - 3 #/hr.

Heat Transfer Unit - Burner Rating - 5.0 M BTU/hr.

0737004

PCB-ARCH0756344

Dept. Chlorophenols

Process Quantity (#/yr.) - 59.52 M +18.87 M by product

Process wt. rate (#/hr.) - 9911.97 #/hr.

Air Emissions - Hydrocarbons

Storage Tanks - 25 #/hr.

Air Emissions - Particulates

Santobrite Drying - Rotolouvre Dryer - cyclone & Schneible scrubber

Rate 12000 #/hr Stack Ht. 49 ft.

Operation time 19.2 hr/day Inlet gas rate 11,000 SCFM

Emissions 10 #/hr.

Santobrite milling & packing - Air scrubbing system

Rate 12,000 #/hr Operation time 19.2 hr/day

Stack Height 49 ft. Inlet gas rate 18,000 SCFM

Emission rate 18 #/hr.

Pentachlorophenol Prilling - Prilling Tower, Venturi Scrubber, Blower & Stack

Rate 5000 #/hr. Stack height 44 ft.

Operation time 10 hr/day Inlet gas rate 12,000 SCFM

Emission rate 5 #/hr.

Heat Transfer Units - Burner rate 1 @ 6.4 M BTU/hr
1 @ 4.2 M "

0737005

PCB-ARCH0756345

Dept. Rubber Chemicals

Process Quantity (#/yr.) 48.2 M

Process wt. rate (#/hr 12,212.67

Air Emissions - Hydrocarbons

North & South Vent 20 #/hr.

Tank & Reactor Vent 300 #/hr

Air Emissions CO

Reactors, Vents, etc. 235 #/hr.

Air Emissions - Particulates

Bulk Transfer - Potassium Carbonate

45,000 # every 75 hr. Flow rate 50.0 SCFM

Operation Time .30 hr/day

Stack height 45 ft. Emissions to Atmosphere 6.0 #/hr.

Air Emissions - Particulates

Equip. - Reactor, condenser, vent, separator

Stack height 88 ft

Inlet gas rate 810 SCFM

Batch Operation 6 hr/batch

Emission rate 1.6 #/hr.

0737006

PCB-ARCH0756346

Dept. Chlorinated Benzenes

Process Quantity (#/yr.) - 135.5 $\overline{M}$ + 68.0 $\overline{M}$ By product

Process wt. rate (#/hr) 3382.92 #/hr

Air Emissions - Hydrocarbons

Storage Tanks - 30 #/hr

Vacuum Jets 14 #/hr.

Cons. Vents - 10 #/hr.

0737007

PCB-ARCH0756347

Dept. Nitrated Chlorobenzenes

Process Quantity (#/hr.) - 80.104 $\overline{M}$ + 93.0 $\overline{M}$ (By Product) → 173.104 $\overline{M}$

Process Wt. rate (#/hr) - 18,962.5 #/hr

Air Emissions - Hydrocarbons

Tank Vents 12 #/hr

Separator 5 #/hr.

Jets - 30 #/hr

Tank Car Loading 2# /hr. (adj.for 24 hr.day)

Air Emissions - No_x

Tank Vents 5 #/hr

Nitration Tower 4 #/hr

Scrubber stack 15 lb/hr. No_x

Stack height 60 ft.

Gas flow rate 200 SCFM

0737008

PCB-ARCH0756348

Dept. Nitrated Organics

Process Quantity (#/yr.) 11.89 $\overline{M}$ + 6.07 $\overline{M}$ By prod.→17.96 $\overline{M}$

Process wt. rate (#/hr) 2518.0

Air Emissions

No_x Storage Tanks, fume scrubber 3 #/hr.

Hydrocarbons tank vents, fume scrubber 5 #/hr.

0737009

PCB-ARCH0756349

Dept. Nitro Anilines

Process Quantity (#/yr) 11.6 M

Process wt. rate (#/hr) 1054.6

Air Emissions - Hydrocarbons

Material Transfer 0.8 #/day

Tank Vents 0.6 #/day

Column 2.0 #/day

Air Emissions - Particulates

PNA - drying, classifying and packing

Inlet gas rate 6800 SCFM Process wt. rate 1000 #/hr

Stack ht. 35 ft. Emissions to atmosphere ~1 #/hr

ONA-Flaking

Inlet gas rate 500 SCFM Process wt. rate 3500 #/hr

Stack ht. 20 ft. Emissions to Atmosphere ~.75 #/hr.

0737010

PCB-ARCH0756350

Dept. Dry Bleachs

Process Quantity (#/yr.) 18 M

Process wt. rate (#/hr) 5238.79

Air Emissions - Particulates

Bleach - Compaction, crushing, screening and re-compaction of fines

Process wt. rate 27,000 #/hr

Inlet gas rate 1500 SCFM

Stack ht. 110 ft,

Emissions <1 #/hr.

0737011

PCB-ARCH0756351

Dept. Biphenyl Storage

Air Emissions - Hydrocarbons

Tank Vents 0.5 #/hr.

PCB-ARCH0756352

Dept. Sulfuric Acid Unit

Air Emissions - gases, mists & aerosols

Contact Sulfuric Acid Plant

Material Sulfur

Process wt. rate 16,577 #/hr.

Operation time 24 hrs/day

Inlet gas rate 40,800 SCFM

Emission Rate 0.9 #/hr

Stack ht. 150 ft.

Air Emissions - SO_2

H_2SO_4 Stack 698 #/hr. SO_2

Stack ht. 150 ft.

Dia. 5.0 ft.

Velocity 41.0 fpx

Volume 48,290 cfm

Temp. 115°F

Process Quantity (#/yr) - 500 M

Process wt. rate (#/hr) - 19,461.8 #/hr

Dept. Phosphorus Pentasulfide

Process Quantity (#/yr) 42 M

Process wt. rate (#/hr) 5183.88

Air Emissions - Particulates

Drumming molten phosphorus pentasulfide - Platform on scales with hood & exhaust system

Material P_2S_5

Process wt. rate 3375 #/hr

Operation time 8 hr/day

Inlet gas rate 190 SCFM

Emissions to atmosphere 0.27 #/hr

Stack ht. 27 ft.

P_2S_5 Manufacture - vents from inert atmosphere purge system

Material P_2S_5 Process weight rate 4000 #/hr

Inlet gas rate 47 SCFM

Stack ht. 40 ft

Emissions to atmosphere 4.0 #/hr

Therminol unit rated heat input 3 M BTU/hr

0737014

PCB-ARCH0756354

Dept. Muriatic Acid

Process Quantity (#/yr) - 45 M

Process wt. rate (#/hr) 5535.43

Air Emissions - Hydrocarbons - Drowning jet 3 #/hr

Air Emissions - Steam & Gases

25% Muriatic Acid Loading - blower & packed tower

Material 32% HCl 97,000 #

Stack ht. 26 ft.

Process weight rate 48,500 #/hr

Operation time 5.5 hr/day

Inlet gas rate 400 SCFM

Emission Rate 0.05 #/hr

Dept. Sulfuric Acid Tank Farm

Air Emissions - Mist & Aerosols

Oleum Storage & Loading - storage tanks & vehicle loading docks

Material 15-35% oleum

Process wt. rate 46,100 #/hr

Operation time 24 hr/day

Inlet gas rate 7.0 SCFM

Emission rate 2.5 #/hr

Scrubbed added to unloading system

Dept. Chlorine-Caustic

Process Quantity (#/yr) 211.9 $\overline{M}$ + 5 $\overline{M}$ by product

Process wt. rate (#/hr) 21091.89

Air Emissions - Particulates

Caustic Soda concentration and sludge removal - evaporator & settling tank

Process wt rate 149,500 #/hr Operation time 24 hr/day

Inlet gas rate 4030 SCFM Stack ht. 37 ft

Emissions to atmosphere 0 #/hr

0737017

PCB-ARCH0756357

Dept. Santosite

Process Quantity (#/yr) 48 M

Process wt. rate (#/hr) 5402.22

Air Emissions - Particulates

Sulfur Dioxide Absorber

Process wt. rate 235,270 #/hr

SO_2 5670
H_2O 174,000
Sodium Sulfite 55,600

Operation time 24 hr/day
Inlet gas rate 5100 SCFM
Stack ht 60 ft.
Emissions to atmosphere 1 #/hr

Santosite drying - Steam tube, rotary dryer - cyclone

Process wt. rate 11,786 #/hr

Sodium sulfite 11,079
H_2O 707

Operation time 24 hr/day
Inlet gas rate 3000 SCFM
Stack height 55 ft.
Emissions to atmosphere 5 #/hr

Santosite bagging operation - pneumatic conveying system, 2 cyclones, bag collector

Material - Sodium Sulfite
Process wt. rate 12,000 #/hr
Operation time 24 hr/day
Inlet gas rate 7700 SCFM
Stack ht. 80 ft.
Emissions to atmosphere 7 #/hr

Santosite Bulk System - pneumatic conveyor - bag collector

Material - Sodium Sulfite
Process wt. rate 16,000#/hr.
Operation time 8 hr/day
Inlet gas rate 600 SCFM
Emissions to atmosphere 1 #/hr

0737018

PCB-ARCH0756358

Air Emissions - SO_2

Santosite Scrubber Stack

Temp. 185°F

Velocity 60.4 ft/sec.

Gas volume 106.7 ACF/sec.

Inside Dia. 1.5 ft.

Stack ht. 48 ft

Emissions to atmosphere 1.6 #/hr SO_2

Air Emissions - Particulate

Acid mist - 26.5 #/hr H_2SO_4

0737019

PCB-ARCH0756359

Dept. Phosphoric Acid

Process Quantity (#/yr) 50 M

Process Wt. rate (#/hr) 2513.59

Air Emissions - Particulates

Phosphoric Acid Production - Absorber, Scrubber, Demister

Process wt. rate 99383 #/hr including evap. H_2O

Stack ht. 81.0 ft.

Inlet gas rate 14737 SCFM

Emissions to atmosphere 22.4 #/hr (H_3PO_4)

0737020

PCB-ARCH0756360

Powerhouse

#5 Boiler

Rated heat input 134 M BTU/hr

Firing rate 12.6 MCF/hr. gas; 950 GPH oil

Annual fuel consumption 750,000 MCF gas
700 M gal. oil

Gas velocity 46,200 CFM 4'-6" dia. 140 ft. ht. stk

#6 Boiler - Same as #5

#7 Boiler

Rated Heat input 134 M BTU/hr

Firing rate 12,200 #/hr (at full capacity)

Annual fuel consumption 36,600 tons

Gas velocity 43.5 ft/sec. 691.7 cfs

Stack ht. 140 ft.

Temp. 181.0°F

#8 & #9

Rated heat input 150 M BTU/hr

Firing rate 11,800 #/hr (at full capacity)

Annual fuel consumption 35,400 tons

Gas velocity #8 (40.5 ft/sec.,644.0 cfs)
#9 (42.5 ft/sec.,675.8 cfs)

Stack ht. 140 ft.

Temp. #8 184.0°F #9 185.0°F

0737021

PCB-ARCH0756361

Powerhouse (continued)

#10

Rated heat input 266 M BTU/hr

Firing rate 24,100 #/hr (at full capacity)

Annual fuel consumption 47,750 tons

Gas velocity 15.86 ft/sec. 1841 cfs

Stack ht. 140 ft.

Temp. 195°F

Coal Analysis
11,000 BTU/#
10% Ash
3- 3.5% Sulfur

0737022

PCB-ARCH0756362

Dept. Aroclor Incinerator

Air Emissions

Incinerator

Stack ht 45 ft.

Inside Dia 22"

Temp. 141.0°F

Velocity 45 ft/sec.

Gas volume 119 ACF/sec

Emissions to atmosphere HCl 24 ppm ~1 lb/hr

Particulates 0.017 gn/cu ft

Chlorine 30 ppm

0737023

PCB-ARCH0756363