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MONSANTO COMPANY
Sauget, Illinois

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W.G.KRUMMRICH PLANT -- LONG RANGE ENVIRONMENTAL CONTROL PLAN

TO: Mr. F. J. Holzapfel
General Offices

cc: Messrs.
E. R. Billen
G. L. Bratsch
T. W. Dalton
C. N. Deubner
J. T. Garrett - G.O.
P. B. Hodges - G.O.
D. B. Hosmer - G.O.
J. C. Hume
D. W. Jackson
A. E. Leisy
M. L. Mullins - G.O.
J. Munoz
D. C. Otto
D. Rachell
R. A. Stohr - G.O.
R. M. Stovall
D. Weber
B. R. Williams

The overall objectives of this plan are to comply with all State and Federal regulations; to maintain production of present and proposed products at optimum rates and costs; to avoid expensive, crash, effluent reduction programs; and to properly manage the environmental control effort.

We propose to achieve these objectives by the following actions. Details on each item are included in the attached appendix.

1. Air

1.1 Develop a strategy and action priority plan and be in compliance with State and Federal air regulations by 1/1/75.

1.2 Completion of the revised particulate emission reduction program presently on file with the Illinois Environmental Protection Agency by 10/1/71.

1.3 Reduction of sulfur dioxide emissions sufficient to reach the Illinois ambient air goals by 1/1/73.

1.4 Reduction of oxides of nitrogen, oxidants, carbon monoxide, hydrocarbons and odors to meet regulations by 1/1/73.

2. Water

2.1 Develop a strategy and action priority plan to comply with the new water effluent regulations by 10/1/71.

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2. Water (Cont'd)

2.2 Reduce the flow of all discharges to the sewer to their lowest economically feasible level by 12/31/73.

2.3 Complete feasibility studies for compounds that should be removed at in-plant location instead of Village Treatment Plant by 1/1/72.

2.4 Operation of pollution control items developed in-plant (2.3) required by 12/31/73.

2.5 Secondary treatment of all wastes entering the Mississippi River is required by 12/31/73. (Note: To continue operation beyond this point the State will have to approve a variance).

3. Land

3.1 Develop a strategy and action priority plan for all solid wastes presently being handled by the Sanitary Landfill and Sauget's Landfill by 5/1/71.

3.2 Develop alternate disposal methods for liquid and solid chemical wastes presently being hauled to the Sauget and Monsanto Sanitary Landfill and have operational for use by 1/1/74.

4. Noise

4.1 Develop a plan to comply with all regulations by 1/1/73.

5. General

5.1 Be current with all pertinent, proposed and existing regulations.

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5. General (Cont'd)

5.2 Cooperate with regulating agencies and individuals involved to achieve realistic standards by means of oral presentations, personal contact and written testimony.

5.3 Prepare and follow-up on permits and variances required to maintain production within time period required by law.

5.4 Develop an effective action plan to handle environmental incidents by 6/1/72.

5.5 Initiate by 9/1/71 and sustain an educational program to develop the good practice needed throughout the WGK Plant to put the above program into effect.

5.6 Initiate by 9/1/71 an environmental review procedure to cover the safety, pollution control and noise reduction requirements of all projects and process modifications.

5.7 Develop an Air Episode Action Plan and have approved by the Illinois EPA by 6/1/71. Maintain surveillance and effectiveness of plan by an annual review with appropriate plant personnel.

5.8 Coordinate activities with appropriate Organic, Inorganic, Legal and Medical people.

5.9 Develop a public relations program meeting the communication needs for regulating bodies and legislators, ecology groups, student groups and our own employees.

M. R. Foresman

C. F. Buckley

P. E. Heisler

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Att.

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APPENDIX

DETAILS OF LONG RANGE ENVIRONMENTAL CONTROL PLAN

The target dates involved in the plan are premised on either existing regulations or our best guess when regulations will be enacted. It is recognized that many of the regulatory bodies are establishing limits and dates that will require preparation and approval of variances.

The plan involves all functional groups at W.G.K. This plan will be kept current to coordinate the actions of these groups to minimize duplication of effort and crash reduction programs.

It cannot be too strongly emphasized that if we attempt to wait to meet regulations as they are enacted by adding downstream control measures, both the capital and the operating cost will be prohibitive. Furthermore, the drain on engineering resources will be excessive. Therefore, a major part of the plan consists of building pollution control into our operation. Success of this plan will depend on how well we seize opportunities to reduce the amount of waste material to be controlled. Such opportunities will arise during changes in equipment or methods of operation, during repairs and in the design of new equipment. By the same reasoning we must avoid any changes which would result in an increased waste load.

This requires an educational program to stimulate continued planning by all groups for better control with a follow-up review before the changes are put into effect.

This plan is based on the following premises:

A. State regulations require secondary treatment for all wastes entering the Mississippi to be in operation by 12/31/73.

B. State regulations on sulfur dioxide in addition to particulates will be enacted that will require 70% or greater reduction in SO_2 emission by 1/1972. Also, virtually impossible sulfuric acid plant regulations on mist, vapor and SO_3 will be enacted by 1/1972.

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DETAILS OF LONG RANGE ENVIRONMENTAL CONTROL PLAN

C. State regulations on other air pollutants, e.g., hydrocarbons, oxidants, oxides of nitrogen and carbon monoxide will follow or coincide with the SO_2 regulations.

D. Public opinion may precipitate State or Civil action on other air or stream pollutants which could cause a nuisance or are potentially harmful.

E. Landfill disposal of liquid and solid chemical wastes will not continue at its present location past 1974 because of lack of space or ground water contamination.

Details -- Elaboration upon Specific Actions

1. Air

A letter of intent was sent to the Illinois Air Pollution Control Board in 1967 listing all operations capable of emitting particulate material to the atmosphere and giving estimates of the amounts emitted. This was followed by an Air Contaminant Emission Reduction Program by which those operations not in compliance with the regulations would be brought into compliance. This program has been completed with the exception of the installation of dust collectors on #5 and #6 boilers which have been abandoned in favor of conversion to gas firing with oil back-up. Gas firing will be completed on #5 boiler by 10/1/71. No. 6 boiler will be converted when the additional gas is available. A permit for change of this plan was submitted to the State in 9/1970 but there has been no response to-date.

In 3/1971 new regulations were proposed by the Illinois Pollution Control Board which would impose more stringent limitation on the emission of particulates and add sulfur dioxide, sulfur trioxide, acid mists, sulfuric acid vapor, hydrocarbons, carbon monoxide, oxides of nitrogen, "oxidants", to the list, each having its own emission standard and odors.

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These standards are the subject of public hearings and there is no way to forecast the numerical values which will eventually be set. However, there is little doubt that the application of the best available control technology will be required to reach them. Our plan is to minimize the amount to be controlled by good practice and prepare for the installation of better than adequate control equipment where it is obvious that it will be needed.

The principle actions are:

(A) Reporting

An accurate record to show the status of the program and any changes made is an essential feature of this plan. More extensive use of the data process systems available at W.G.K. will enable use to improve the lag time between test measurement and reporting of results.

(B) Emission Inventory

New source operation data will be compiled by 7/1/71 to include all atmospheric emissions. Measured data will be used where available but estimates will be made from process data where necessary to meet the deadline.

(C) Special Testing

Where problem areas exist, methods will be developed and tests made to provide accurate data both for the inventory and for the design of control equipment.

a. Chlorine and particulates from ACl by 6/1/71.

b. SO_2, SO_3 and H_2SO_4 by 8/1/71.

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c. Powerhouse emissions - confirm particulate levels and measure mercury and oxides of nitrogen by 10/1/71.

d. Oxides of nitrogen from Departments 273 and 209 by 10/1/71.

e. Department 236 emissions by 11/1/71.

f. Department 250 emissions and periodic checks.

g. Any other gases or particulates by 1/1/72 as indicated by the inventory.

(D) Powerhouse

a. Operate No.'s 5 and 6 boilers at minimum rate until gas is installed.

b. Define requirements to reach proposed SO_2 and particulate emission rates by 7/1/71. (This is the deadline in the State proposal but may be changed after hearings.)

c. Have coal supplied and new dust collection equipment in operation by 1/1/72 or have variance from State.

(E) ACl - Department 251

a. Determine chlorine emission levels which must be met by 7/1/71.

b. Complete design work by 1/1/72.

c. Complete installation of control equipment by 1/1/73.

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(F) Department 255

a. Determine CO and hydrocarbon emission levels which must be met by 7/1/71.

b. Design control system for reactor off gases by 1/1/72.

c. Complete installation of control equipment by 1/1/73.

(G) Department 236

a. Define needs by 1/1/72, e.g., particulates and odor.

b. Design and install additional control measures as necessary by 1/1/73.

(H) Department 250

a. Define needs and decide on course of action by 1/1/72.

(I) Other Problem Areas

a. Define needs in other areas by 1/1/72.

b. Install equipment or obtain variances where necessary.

2. Water

Since August, 1970, Monsanto Biodize Systems, Inc. has been conducting a two-year waste treatment study for the Village of Sauget to define the process that will be used for secondary treatment of its waste water. This detailed study will culminate with the construction and operation of the secondary treatment plant during 1974.

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2. Water (Cont'd)

This appears to be the best possible date and will require approval of a variance since the December 31, 1973 date imposed by the State cannot be met. It is estimated that this will cost Monsanto in the 5 to 7 million dollar range.

In order for the WGK Plant to achieve stream pollution control in the most economic matter, it is essential that all department discharges be evaluated for reduction and or removal within the department or at the Village Treatment Plant. Where it is found that the removal of certain chemical compounds is technically impossible at the Village Treatment Plant, then in-plant treatment processes will have to be developed, such as have been done for Hg and Aroclor.

This plan proposes to achieve the maximum reduction of stream pollutants by 1974 so that Monsanto Biodize can use this figure in their design of the secondary treatment plant. The principal actions are as follows:

(A) Reporting

Same as stated under water.

(B) Waste Inventory

A complete inventory of waste streams will be compiled from process data and production rates by 5/1/71. This data will be used in the development of a computer program which will estimate the total plant stream pollution load on a day-to-day basis. This program will be updated as changes are made and will allow us to accurately determine the major candidates for an in-plant stream load reduction program.

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2. Water (Cont'd)

(C) Continuous Monitoring

An on-stream monitoring instrument has been purchased and will be installed in a trailer by 7/1/71 for use in confirming the results of our waste inventory. This instrument will also be used to monitor the performance of in-plant reductions and/or treatment processes as they are brought on stream during 1972 and 1973.

(D) Volume Reductions

Indiscriminate use of both city and well water has greatly increased the waste load from W.G.K. A volume reduction program will be established by utilities engineering and pollution control to help minimize the plant water usage. All groups at W.G.K. will have to take an active part in pollution control in order for this plan to be effective.

(E) Treatability Studies

Monsanto Biodize Systems, Inc. is presently conducting waste monitoring and treatability studies for the Village of Sauget secondary treatment plant. Our group is working with Biodize to determine where in-plant reduction and or treatment for removal of particular chemical compounds will be required in order for the treatment plant to meet the State's effluent standards.

Feasibility studies with justification for projects for the removal of these materials will be completed by 1/1/72 with process operation by June, 1974.

(F) Aroclor Control

An Aroclor Control Program has been in effect since early 1970 with great reductions in losses being made. After

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2. Water (Cont'd)

the conversion of all therminol units to non-aroclor therminol by 5/1/71 the individual department monitoring program will be expanded to pinpoint small losses. The total Aroclor Control Program being administered by TSD and Pollution Control has as its objective the reduction of PCB in the effluent to the river to a level of 10 ppb by 9/1/71.

(G) Mercury Control

The Mercury Reduction Program is continuing as planned Daily measurement of losses is being handled by our group with the results being used for process control. As new projects are completed, special monitoring program will be conducted to confirm estimated removal efficiencies. With the finalization of the 0.5 ppb specification (5 lbs. per year exception) in April, 1971, a variance will be necessary to operate the Chlor-Alkali Department. The scheduled timing to meet the new regulation has not been finalized but will be about mid 1973. The cost will be about 1.5 million dollars.

(H) Acid Wastes

An investory of acid wastes has been completed and alternate methods for recovery and/or disposal will be evaluated during 1971. The production of chlorine from spent ACl should be re-evaluated during 1971 considering the neutralization requirement of the plant effluent prior to secondary treatment. A program for deepwell disposal of these acid wastes has been established and approval from State of Illinois officials to being drilling of the exploratory well is being sought.

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2. Water (Cont'd)

(I) Other Wastes

An inventory of major losses will be compiled and a reduction program will be established by 1/1/72. Reduction projects will be developed and brought on stream prior to the 1974 secondary treatment date. Our group will identify and quantify other sources of mercury loss by 1/1/72.

3. Land

The continued use of the Monsanto landfill has been in doubt since 1968 when the State found evidence of ground water contamination, and the recent State inspection of the Village landfill, with many deficiencies noted, could conceivably cause the Pollution Control Board to issue a cease and desist order against both landfills. Evaluations are in progress to provide an alternate method of disposal by 1973. Methods being considered are as follows:

(A) Deep Disposal Well

This method is the most efficient and least costly method for the disposal of aqueous waste which could not easily be handled by incineration or conventional surface treatment.

An evaluation of all materials to be disposed of by this method has been conducted and submitted to the State for approval. A detailed economic evaluation of this disposal method will be conducted during 1971 after pilot plant neutralization cost data is supplied by Monsanto Biodize for the secondary treatment plant. It must be recognized, however, that only aqueous solutions free of suspended matter can be disposed of in this way.

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3. Land (Cont')

(B) Incineration

For positive control of liquid and solid combustible waste, incineration facilities will be required. Since most of the Queeny waste will be amenable to incineration, it appears that it would be more desirable to use the same facilities and personnel for disposal of the present landfill waste. At the present time we are developing a tentative list of wastes to incincerate in the Aroclor incinerator, and we hope to start disposal by 7/1/71. A detailed study will be conducted for the remaining landfill wastes to determine their physical and chemical characteristics so that we can define the exact handling, storage and incineration requirements prior to 1/1/72.

(C) Landfill

A sanitary landfill will be required as a disposal method for our non-combustible chemical solids and trash. Because of the uncertainty of the continued operation of the Village of Sauget landfill, a study should be conducted to determine if Monsanto should consider purchasing land in the Millstadt strip mining area for a sanitary landfill, or contract with an established landfill in this area. Since the Chemical and Sanitary Landfills handle material from the General Office and Queeny as well as W.G.K., it is recommended that CED handle the study and coordination of efforts from the three locations.

4. Noise

(A) Initiate adequate planning for low noise levels in new projects by 9/1/71.

(B) Measure noise levels throughout the plant by 1/1/72.

(C) Determine reductions required and develop plans to achieve these reductions by 1/1/73.

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DETAILS OF LONG RANGE ENVIRONMENTAL CONTROL PLAN

5. General

(A) Personnel will keep current with regulations by the use of newsletters and other available sources, e.g., B.N.A., The Oil and Gas Association, APCA, WPCF and by limited attendance at hearings, etc.

(B) Environmental personnel will offer testimony and other assistance to regulatory bodies and responsible scientific groups who influence the development of emission standards.

(C) A plan will be developed to handle pollution incidents so as to:

a. Positively identify the source of any complaint... stream, air or noise pollution - in the minimum of time.

b. Minimize the danger to the community...initiating evacuation or warning downstream water users, if necessary, in the event of a major release of dangerous material.

(D) Adequate control of waste requires commitment from all personnel in the plant. An aducational program comparable to our safety program is essential to the success of this plan.

(E) Environmental Reviews

Each member of the plant must review his own work for its environmental impact as he proceeds. A procedure for a stage-by-stage review by a committee has been developed by CED and will be adapted for plant use. The key man is the individual who is executing the project and his objectives in environmental control must be made clear at the outset.

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