

ALLIED CHEMICAL CORPORATION

MEMORANDUM ALLIED CHEMICAL - CONFIDENTIAL

May 17, 1974

TO: E. W. Callahan

SUBJECT: Monochem Vinyl Chloride Plant
(Refer verbal request EWC/WMR 5/8/74)

1.0 SUMMARY

The Monochem facility located at Geismar, La. manufactures vinyl chloride from acetylene using a process developed by UniRoyal. It is an older process, and there are only two plants using this type of process in operation in the United States.

The environmental control problems at this site are not significant. The primary problem is biological oxygen demand (BOD). There is a problem with vinyl chloride releases relative to the developing CSHA Standards. However, there are no visible plans for shut-down of the facility.

Available information indicates the plant to be well managed with good operating discipline and housekeeping. Since the process is an older unit, there may be some economic problems that are not visible. No attempt was made in this study to probe the financial area.

2.0 DISCUSSION

A. Historical

The Monochem plant which is jointly owned by Borden Chemical and UniRoyal Inc. started operation in March 1962. The facility has a capacity of about 1 MM lbs. vinyl chloride/day producing the vinyl chloride from acetylene generated from

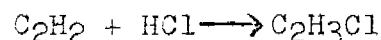
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In its earlier operating history, the facility apparently had some difficulty with discharges of mercury, phenol, suspended solids, and BOD. Prior to 1971 waste treatment facilities were installed for handling sanitary wastes, phenol removal by activated carbon and control of mercury. Samples taken on June 22, 1971 showed the following waste definition.

Volume	1,400,000 gal/day
pH	6-9
Phenol	2 pounds per day (ppd)
COD	4,700 ppd
TOC	3,800 ppd
Lead	4 ppd
Copper	1.7 ppd
Chromium	0.2 ppd (?)
Mercury	0.02 ppd
Zinc	23 ppd
Suspended Solids	74,300 ppd

The process employed by Monochem is reported to have been developed by UniRoyal, though it is a classical route to vinyl chloride via an addition reaction. Acetylene produced

from natural gas by partial combustion (BASF process) is reacted with anhydrous hydrogen chloride to produce vinyl chloride.(1)



The addition reaction proceeds in the vapor phase. The feedstocks, acetylene and anhydrous hydrogen chloride are fed into tubular reactors which are packed with mercuric chloride impregnated on granular activated carbon. The reactor effluent is sent through a three-column distillation system for purification; purified vinyl chloride is taken as bottom from the last column. Because no water comes into direct contact with the reactants or product and no reaction water is generated, there is no direct contact process waste water.

There are organic waste streams which reportedly are treated (?) and recycled, e.g. the bottoms from the vinyl chloride distillation can contain some mercury, a heavier chlorinated hydrocarbon, and vinyl chloride.

Sodium bisulfite is believed to be used to remove aldehydes from the vinyl chloride. This can produce an aqueous waste stream containing organics. The final purification of the vinyl chloride is via contact with what are termed "activated carbon towers" normally packed with a mixture of potassium carbonate, flake sodium hydroxide, and activated carbon. Although this is a dry solids/liquid

(1) There is only one other plant utilizing this process to produce vinyl chloride in the U. S., the Tenneco Facility at Plaquemine, Louisiana.

contact, the recharging of these columns and the recharging of the reactor system can generate wastes. Contaminated rain water or housekeeping wastes from operations are collected and treated for mercury removal. The treatment process has not been completely identified, however it is believed to be precipitation of mercuric sulfide using sodium sulfide followed by carbon treatment.

There are purge gas streams from tank car loading and from possibly the stills. These, however, do not pose any significant problems relative to existing air control; but, they do generate the standard problem relative to vinyl chloride which is being experienced by all VCM producers.

D. Effluent Control

The Monochem plant discharges through one outfall to the Mississippi River. The process waste volumes (average) are as follows:

Vinyl Chloride Plant.....	202,000 gal/day
Acetylene Plant.....	324,000 gal/day
Utility Operations.....	935,000 gal/day
Sanitary Wastes.....	140,000 gal/day

The average effluent loading from the plant discharged to the Mississippi River is as follows:

<u>PARAMETER</u>	<u>AVERAGE CON- CENTRATION PPM</u>	<u>NET LOADING PPD</u>
Volume		1,600,000 gpd
pH		6 - 9
BCD	130	1,500
COD	290	2,000

<u>Parameter (contd.)</u>	<u>Average Con- Centration PPM</u>	<u>Net Loading, PPD</u>
Total Suspended Solids	1,600	2,100
Chromium	0.3	4
Mercury	0.0006	0.01
Oil & Grease	4	50

Ammonia is found in the effluent to a minor extent. However, this is attributed to pick-up of air contamination in the cooling tower operations. There is some thought that it may originate from amine treatment of the steam condensate.

The facility operates a sanitary treatment unit with aeration, clarification, and chlorine disinfection before discharge. The plant is provided with significant area containment to insure collection of contaminated waste waters. At the present time the effluent control program calls for completion of process engineering and development work to define the process to reduce the BOD loading by mid-1975. The BOD reduction facilities would then be installed reaching an operating state by mid-1977.

D. EPA Negotiations

Monochem filed a Corps of Engineers Application in 1971. A modified application was submitted on February 1, 1974 at the request of EPA Region VI. There have been meetings with the EPA for development of a draft permit. The draft permit is expected to be released to the facility during the next four weeks with permitting anticipated during the third quarter of 1974. In the negotiations with the EPA, the Monochem personnel

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have stressed the control that exists at the site and the past abatements. In addition they have attempted to show that the existing discharge has a negligible effect on Mississippi River water quality.


W. M. Reiter

WMR/nm
cc: A. J. von Frank

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