HAZARDOUS WASTE MANAGEMENT

Minimize the quantities of hazardous waste generated and emphasize upgrading to co-product status those wastes which cannot be eliminated. For the remaining wastes, select treatment/disposal practices taking into consideration: cost effectiveness, compliance with regulations, risk evaluation and long-term product strategies. Establish Monsanto monitored and/or controlled disposition of all solid wastes. Reduce Monsanto's dependency on landfill and deep-well injection of wastes.

INTRODUCTION

The general order of preference for managing hazardous waste will be:

1. Reduce the generation of hazardous waste through process improvement.
2. Recovery or upgrading of hazardous waste for raw materials, resale or energy use.
3. Biological, chemical or physical treatment of the waste to convert it to innocuous material.
4. Thermal destruction or separation of hazardous constituents in the waste with energy or raw material recovery where feasible.
5. Deep-well disposal, limited to individual process waste streams approved by the EPC.
6. Land and ocean disposal of wastes not amenable to practical alternatives, in accordance with Program No. #4 of this Guideline.

Operating companies will use the most cost effective mix of Monsanto owned or approved contractor facilities with proper regard for long-term security and liability.

PROGRAM

The following action program applies only to Monsanto's U.S. operations. The specific program for Europe-Africa is set forth in the "Management Plan for Process Related Waste" of May, 1983, published by Monsanto Europe-Africa Environmental Operations. The latter provides strategic direction for the management of process related wastes in Europe-Africa over the next 5-10 years. Overall policy direction to this plan is provided by this Guideline. Specific programs for other ex-U.S. operations will be developed later after more experience has been gained with the U.S. program. In the meantime, ex-U.S. operations will continue to dispose of their wastes in conformance with host country regulations, the dictates of social responsibility and the intent of the above order of preference of treatment/disposal methods.

1. **Waste Management Plans**
   Each operating company will prepare annual waste management plans beginning in 1983 as part of the long-range environmental and long-range business plans. Operating companies will include hazardous waste plans in 1984 results.

2. **Hazardous Waste Reduction**
   Each operating company assigns an individual with prime responsibility for coordinating the hazardous waste reduction effort in accordance with the approved Hazardous Waste Management study of November 15, 1982.

   Specific numerical goals will be set by end of 1983 for each operating unit.

3. **Waste Treatment/Disposal Practices**
   Unless excluded with the approval of the EPC, hazardous waste streams will be treated or disposed of in accordance with the following guidelines:

   a. Eliminate by January 1, 1984, where alternates are available, the land disposal of "acutely" hazardous wastes, by either governmental or Monsanto definition, through detoxification prior to land disposal or an approved alternate disposal method.

b. Phase out of landfill disposal by January 1, 1986, of all incinerable hazardous waste (6,000 Btu/lb. or readily blendable with other local waste to 6,000 Btu/lb.).

c. Fix, stabilize, encapsulate or otherwise render insoluble or immobile by January 1, 1988, those hazardous wastes disposed of in landfills.

d. Employ ocean dumping of hazardous wastes only on an emergency basis and with the appropriate permits.

4. Deep-Well Injection Program

a. Monsanto will continue to operate its deep-well disposal systems in a sound manner protective of public health and the environment.

b. Each plant using on-site or off-site deep-well disposal will have by December 1984 an emergency contingency plan for exiting deep wells.

c. There will be no new use of deep wells except as approved by the EMC on an exception basis consistent with the overall schedule below. All new project appropriation requests will be based on the economics of disposal technology other than deep wells.

d. Monsanto's total use of deep wells will not exceed the guidelines for reductions shown below:

	Volume Ceiling
Current	5000 gpm
By 12/85	4000 gpm
By 12/86	3000 gpm
By 12/87	2000 gpm
By 12/88	1000 gpm
By 12/89	-0- gpm

e. The total program will be reviewed annually by the EPC for progress, appropriateness and timing.

5. Reporting
The Manufacturing Management Council will report status.

STATUS / OBSERVATIONS

Analysis/Characterization of Wastes
Programs are in place for all Monsanto locations except Greenwood. In that situation, outside processor arrangements are currently underway.

Off-Site Disposal
All hazardous wastes at all locations are disposed of under written contract agreement.

As of July, 1983, all of the off-site locations used for disposal have been inspected by a Monsanto representative within the last three years except two.

Safe Handling Practices
In all cases, disposal site operations are provided with information on waste properties and safe handling practices for each waste. This information is provided, in most cases, in writing as a Monsanto document, one time only or as a supplemental document as part of the contract. In some cases, provision is made on a purchase order, on the disposal firm form or through a regulatory authority.

Deep-Well Injection
Nineteen processes at four U.S. plants currently use deep well disposal with a total flow of 3,074 gpm. Four planned processes will inject an additional 115 gpm into deep wells at three of those four plants. No deep wells are operated or planned at any ex-U.S. sites. The total existing and planned flow of 3,189 gpm is down somewhat from last year's 3,400 gpm.

Operating unit processes planned or under construction which will generate waste to be deep-well injected are as follows:

PLANT/PROCESS	VOLUME (gpm)
Chocolate Bayou	
MHA	52
Sorbic Modifications	45
Pensacola	
Santoprene CEA 3835	2
Luling	
EMA	16

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All processes, both existing and planned, have alternate disposal plans. In general, no definite implementation plans for alternate technology have been made. The implementation will depend on economic or social justification, or when legally required.

Off-site deep-well disposal is employed for four processes: styrene (10.2M lb/yr), phthalic anhydride (2.3M lb/yr), acetic acid (762k lb/yr) and methanol (221k lb/yr) for a total of 13.5M lb/yr.

Hazardous Waste Management Program

The status of the hazardous waste management program varies widely by plant, from not yet having addressed the issue at some plants to establishment of firm 1983 goals and implementation of action plans at others. Generally, most plants have complete 1981 and 1982 hazardous waste inventories and are addressing some of the major issues, such as reduced landfilling. A waste coordinator has been named in each operating company.

All operating companies plan to eliminate the landfilling of incinerable hazardous waste by January 1, 1986, and to fix, stabilize or encapsulate non-incinerable hazardous waste by January 1, 1988. Not all acutely hazardous waste has as yet been detoxified prior to landfilling.

(Revised and Approved: Environmental Policy Committee, October 17, 1983, as Worldwide Environmental Protection Guideline No. 2; Deep-Well Injection Program approved by Executive Management Committee, April 12, 1984.)

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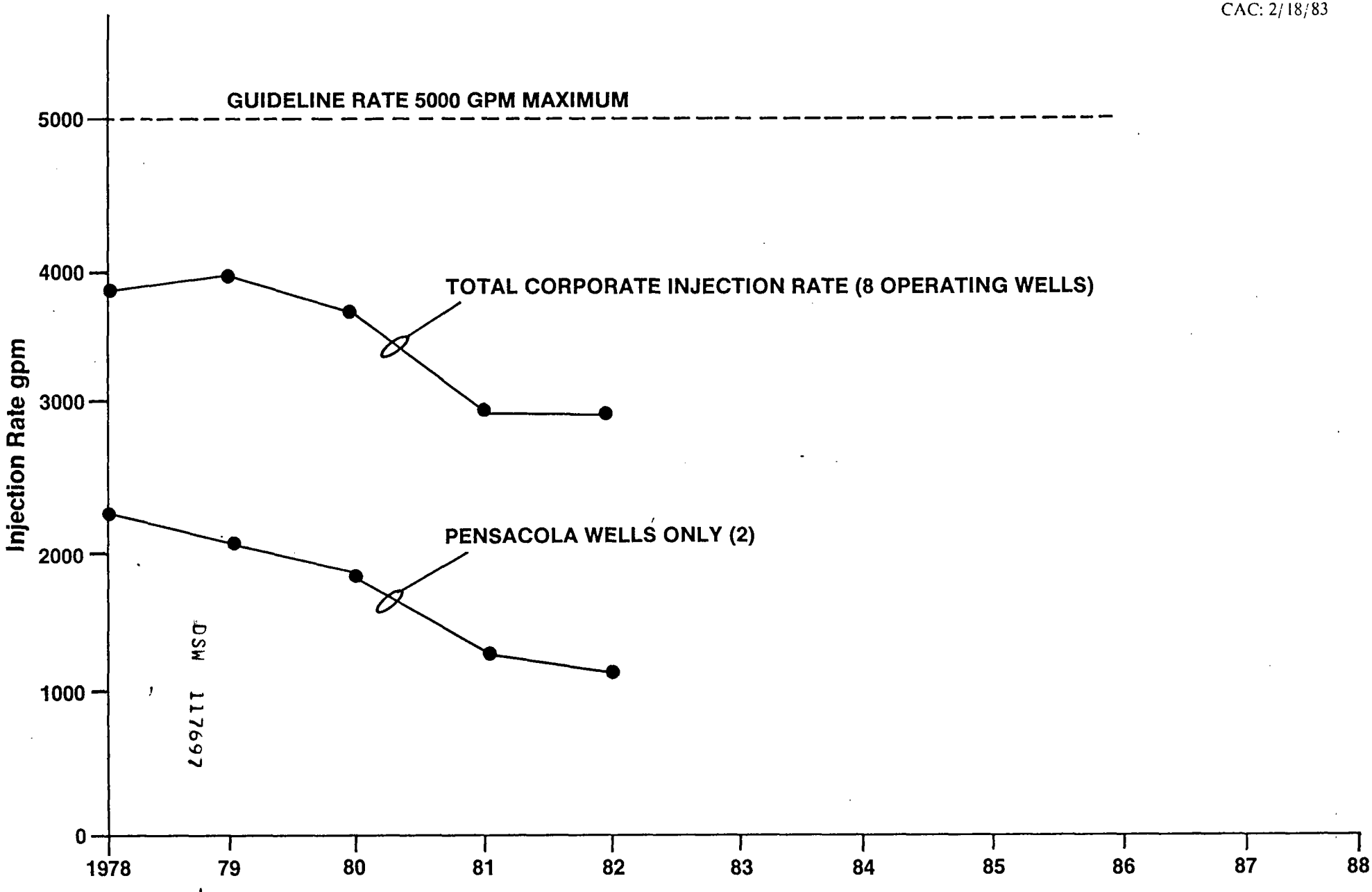
Location **Monsanto**
Deep Well Permit Capacity **5235 gpm**

Approved by
CAC: 2/18/83



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